

**संख्या- 127 /2025/1/ 1043709 /2025/71-1001/1703/2019**

प्रेषक,

**कृतिका शर्मा,**

विशेष सचिव,

उ०प्र० शासन।

सेवा में,

1. कुलपति, किंग जार्ज चिकित्सा विश्वविद्यालय, लखनऊ/यू०पी०यू०एम०एस०, सैफई, इटावा।
2. निदेशक, डा० राम मनोहर लोहिया, आयुर्विज्ञान संस्थान, लखनऊ/ एस०जी०पी०जी०आई०एम०एस०, लखनऊ/जी०आई०एम०एस०, ग्रेटर नोएडा /एस०एस०पी०एच० एण्ड पी०जी०टी०आई० नोएडा।
3. समस्त प्रधानाचार्य, राजकीय मेडिकल कालेज, उ०प्र०।
4. समस्त प्रधानाचार्य, स्वशासी राज्य चिकित्सा महाविद्यालय, उ०प्र०।
5. निदेशक, हृदय रोग संस्थान कानपुर/जे० के० कैंसर संस्थान, कानपुर।
6. निदेशक, कल्याण सिंह सुपर स्पेशियलिटी कैंसर संस्थान लखनऊ।

**चिकित्सा शिक्षा अनुभाग-1**

**लखनऊ:दिनांक : 01/08/2025**

**विषय:-**वित्तीय वर्ष 2025-26 व 2026-27 में राजकीय मेडिकल कालेजों/स्वशासी राज्य चिकित्सा महाविद्यालयों/चिकित्सा संस्थानों/चिकित्सा विश्वविद्यालयों में क्लीनिकल, नान-क्लीनिकल व पैरा क्लीनिकल विषयों के लिए उपकरणों/फर्नीचर के क्रय हेतु तकनीकी विशिष्टियों का निर्धारण किये जाने के सम्बन्ध में।

महोदय,

उपर्युक्त विषयक महानिदेशक, चिकित्सा शिक्षा एवं प्रशिक्षण, उ०प्र० लखनऊ के पत्र संख्या- एम०ई०/पर्चेज(उपकरण)/2025-26/249, दिनांक 06.06.2025 (**छायाप्रति संलग्न**) का कृपया संदर्भ ग्रहण करें।

2- उल्लेखनीय है कि चिकित्सा शिक्षा अनुभाग-1, उ०प्र० शासन के कार्यालय ज्ञाप संख्या- I/472361/2024/71-1001/1703/2019, दिनांक 16.01.2024 द्वारा वित्तीय वर्ष 2024-25 हेतु राजकीय मेडिकल कालेजों/स्वशासी राज्य चिकित्सा महाविद्यालयों/चिकित्सा संस्थानों/चिकित्सा विश्वविद्यालयों में धनराशि रू० 1.00 लाख से अधिक लागत वाले उपकरणों के क्रय हेतु तकनीकी विशिष्टियों का निर्धारण किये जाने हेतु (1) नान क्लीनिकल विषयों हेतु (2) पैरा क्लीनिकल विषयों हेतु (3) क्लीनिकल विषयों व अन्य के लिए (4) सुपर स्पेशियलिटी एवं अन्य अतिविशिष्ट उपकरणों के लिए, पृथक-पृथक कुल 04 समितियों का गठन किया गया है। महानिदेशक, चिकित्सा शिक्षा एवं

1- यह शासनादेश इलेक्ट्रॉनिकली जारी किया गया है, अतः इस पर हस्ताक्षर की आवश्यकता नहीं है।

2- इस शासनादेश की प्रमाणिकता वेब साइट <http://shasanadesh.up.nic.in> से सत्यापित की जा सकती है।

प्रशिक्षण, 30प्र0 लखनऊ के पत्र संख्या-एम0ई0/पर्चेज/2024-25/605, दिनांक 08.11.2024 द्वारा प्रदेश के राजकीय मेडिकल कालेजों/स्वशासी राज्य चिकित्सा महाविद्यालयों/चिकित्सा संस्थानों/चिकित्सा विश्वविद्यालयों में उपकरणों/फर्नीचरों के क्रय हेतु शासनादेश संख्या-133/2021/आई/112605/2021 दिनांक-03.11.2021 द्वारा 136 उपकरण, शासनादेश संख्या-128/2022/आई/244885/2022 दिनांक-07.12.2022 द्वारा 393 उपकरण एवं शासनादेश संख्या-148/2023/आई/426645/2023 दिनांक-10.11.2023 द्वारा 33 उपकरणों की तकनीकी विशिष्टियां, जिनकी वैधता अवधि वित्तीय वर्ष 2024-25 (मार्च, 2025 तक) तक थी, के अतिरिक्त पूर्व के शासनादेशों क्रमशः दिनांक- 28.12.2017, 18.01.2018, 06.03.2018 व 23.08.2018 द्वारा स्वीकृत उपकरणों/फर्नीचरों की विभागवार समेकित सूची संलग्न कर वर्ष 2025-26 हेतु तकनीकी विशिष्टियों का निर्धारण किये जाने हेतु तकनीकी विशिष्टिता निर्धारण समितियों को पृथक-पृथक प्रेषित किये गये थे।

तत्क्रम में प्रो0 पी0के0 दास, अध्यक्ष (क्लीनिकल विषयों हेतु) तकनीकी विशिष्टिता निर्धारण समिति, विभागाध्यक्ष, एनेस्थीसिया एवं गहन चिकित्सा विभाग, डा0 राम मनोहर लोहिया आयुर्विज्ञान संस्थान, लखनऊ ने अपने पत्र संख्या-65/एनेस्थीसिया/डा0रा0म0लो0आ0सं0/2025, दिनांक-29.05.2025 द्वारा कुल 484, डा0 पुनीता मानिक, अध्यक्ष (नान क्लीनिकल विषयों हेतु) तकनीकी विशिष्टिता निर्धारण समिति, आचार्य, के0जी0एम0यू0, लखनऊ ने अपने पत्र संख्या-177/एएनएटी/2025-26, दिनांक-05.06.2025 द्वारा कुल 197 तथा डा0 मोनिका अग्रवाल, अध्यक्ष (पैरा क्लीनिकल विषयों हेतु) तकनीकी विशिष्टिता निर्धारण समिति, आचार्य, के0जी0एम0यू0, लखनऊ ने अपने पत्र संख्या-1713/सी0एम0/टेक्नी0स्पेशि0-2025, दिनांक-29.05.2025 द्वारा कुल 230, इस प्रकार कुल 911 उपकरणों/फर्नीचरों (484+197+230) हेतु तकनीकी विशिष्टियां निर्धारित की गयी हैं, जो महानिदेशक, चिकित्सा शिक्षा एवं प्रशिक्षण, 30प्र0 लखनऊ के उक्त पत्र दिनांक 06.06.2025 द्वारा शासन को उपलब्ध कराया गया है।

3- इस सम्बन्ध में मुझे यह कहने का निदेश हुआ है कि कृपया प्रदेश के राजकीय मेडिकल कालेजों/स्वशासी राज्य चिकित्सा महाविद्यालयों/चिकित्सा संस्थानों/चिकित्सा विश्वविद्यालयों में उपकरणों/फर्नीचरों के क्रय हेतु तकनीकी विशिष्टियों का निर्धारण किये जाने हेतु शासन के उक्त कार्यालय ज्ञाप दिनांक-16.01.2024 द्वारा गठित तकनीकी विशिष्टिता निर्धारण समिति के उक्त 03 अध्यक्षों (क्लीनिकल विषयों हेतु, नान क्लीनिकल विषयों हेतु व पैरा क्लीनिकल विषयों हेतु) द्वारा कुल 911 उपकरणों/फर्नीचरों (484+197+230) हेतु निर्धारित तकनीकी विशिष्टियों (छायाप्रति संलग्न) के क्रम में वित्तीय वर्ष 2025-26 तथा वित्तीय वर्ष 2026-27 हेतु 02 वर्षों के लिए

1- यह शासनादेश इलेक्ट्रॉनिकली जारी किया गया है, अतः इस पर हस्ताक्षर की आवश्यकता नहीं है।

2- इस शासनादेश की प्रमाणिकता वेब साइट <http://shasanadesh.up.nic.in> से सत्यापित की जा सकती है।

उपकरणों/फर्नीचरों के क्रय हेतु नियमानुसार आवश्यक कार्यवाही सुनिश्चित कराने का कष्ट करें। चिकित्सा संस्थाएं अपने स्तर पर तथा राजकीय मेडिकल कालेज व स्वशासी राज्य चिकित्सा महाविद्यालय, महानिदेशक, चिकित्सा शिक्षा एवं प्रशिक्षण, 30प्र0 लखनऊ के पूर्व अनुमोदनोपरान्त आवश्यकतानुसार स्थानीय स्तर पर गठित तकनीकी समिति के माध्यम से हाई एण्ड स्पेसिफिकेशन के उपकरणों के स्थान पर लो एण्ड स्पेसिफिकेशन वाले उपकरणों का क्रय कर सकते हैं।

**संलग्नक-यथोक्त।**

भवदीया,

Digitally signed by  
Kritika Sharma

Date: 31-07-2025

18:35:40

(कृतिका शर्मा)

विशेष सचिव।

**संख्या/ तद्दिनांक, उपर्युक्तानुसार।**

प्रतिलिपि निम्नलिखित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित-

- 1- महानिदेशक, चिकित्सा शिक्षा एवं प्रशिक्षण, 30प्र0 लखनऊ।
- 2- चिकित्सा शिक्षा अनुभाग-2/3/4, 30प्र0 शासन।
- 3- गार्ड फाइल।

आज्ञा से,

(कृतिका शर्मा)

विशेष सचिव।

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1- यह शासनादेश इलेक्ट्रॉनिकली जारी किया गया है, अतः इस पर हस्ताक्षर की आवश्यकता नहीं है।

2- इस शासनादेश की प्रमाणिकता वेब साइट <http://shasanadesh.up.nic.in> से सत्यापित की जा सकती है।

प्रेषक,

महानिदेशक,  
चिकित्सा शिक्षा एवं प्रशिक्षण,  
उत्तर प्रदेश।

सेवा में,

प्रमुख सचिव,  
उत्तर प्रदेश शासन,  
चिकित्सा शिक्षा अनुभाग-एक।

संख्या-एम0ई0/पर्चेज(उपकरण)/2025-26/ 249

लखनऊ:दिनांक-06/06/2025

विषय-प्रदेश के राजकीय मेडिकल कालेजों/स्वशासी राज्य चिकित्सा महाविद्यालयों/चिकित्सा संस्थानों/चिकित्सा विश्वविद्यालयों में उपकरणों/फर्नीचरों के कय हेतु मानकीकृत तकनीकी विशिष्टियों के निर्धारण के सम्बन्ध में।

महोदय,

उपर्युक्त विषय के सम्बन्ध में अवगत कराना है कि शासन के कार्यालय ज्ञाप संख्या-आई/472361/2024 दिनांक-16.01.2024 द्वारा प्रदेश के राजकीय मेडिकल कालेजों/स्वशासी राज्य चिकित्सा महाविद्यालयों/चिकित्सा संस्थानों/चिकित्सा विश्वविद्यालयों में उपकरणों/फर्नीचरों के कय हेतु तकनीकी विशिष्टियों का निर्धारण किये जाने हेतु वित्तीय वर्ष 2024-25 हेतु पृथक-पृथक समितियों का गठन किया गया था। शासन द्वारा उक्त गठित समितियों से ही वर्ष 2025-26 के लिए भी उपकरणों की तकनीकी विशिष्टियां निर्धारण हेतु विस्तारित किया गया है।

महानिदेशालय के पत्र संख्या-एमई/पर्चेज/2024-25/605 दिनांक-08.11.2024 द्वारा प्रदेश के राजकीय मेडिकल कालेजों/स्वशासी राज्य चिकित्सा महाविद्यालयों/चिकित्सा संस्थानों/चिकित्सा विश्वविद्यालयों में उपकरणों/फर्नीचरों के कय हेतु शासनादेश संख्या-133/2021/आई/112605/2021 दिनांक-03.11.2021 द्वारा 136 उपकरण, शासनादेश संख्या-128/2022/आई/244885/2022 दिनांक-07.12.2022 द्वारा 393 उपकरण एवं शासनादेश संख्या-148/2023/आई/426645/2023 दिनांक-10.11.2023 द्वारा 33 उपकरणों की तकनीकी विशिष्टियां, जिनकी वैधता अवधि वित्तीय वर्ष 2024-25 (मार्च, 2025 तक) तक थी, के अतिरिक्त पूर्व के शासनादेशों क्रमशः दिनांक- 28.12.2017, 18.01.2018, 06.03.2018 व 23.08.2018 द्वारा स्वीकृत उपकरणों/फर्नीचरों की विभागवार समेकित सूची संलग्न कर वर्ष 2025-26 हेतु तकनीकी विशिष्टियों का निर्धारण किये जाने हेतु तकनीकी विशिष्टिता निर्धारण समितियों को पृथक-पृथक प्रेषित किये गये थे।

महानिदेशालय के उक्त पत्र दिनांक-08.11.2024 के क्रम में प्रो० पी० के० दास, अध्यक्ष, क्लीनिकल विषयों हेतु, तकनीकी विशिष्टिता निर्धारण समिति, विभागाध्यक्ष, एनेस्थीसिया एवं गहन चिकित्सा विभाग, डा० राम मनोहर लोहिया आयुर्विज्ञान संस्थान, लखनऊ ने पत्र संख्या-65/एनेस्थीसिया/डा०रा०म०लो०आ०स०/2025 दिनांक-29.05.2025 द्वारा कुल 484, डा० पुनीता मानिक, अध्यक्ष, नान क्लीनिकल विषयों हेतु, तकनीकी विशिष्टिता निर्धारण समिति, आचार्य, के०जी०एम०यू०, लखनऊ ने पत्र संख्या-177/ANAT/2025-26 दिनांक-05.06.2025 द्वारा कुल 197 तथा डा० मोनिका अग्रवाल, अध्यक्ष, पैरा क्लीनिकल विषयों हेतु, तकनीकी विशिष्टिता निर्धारण समिति, आचार्य, के०जी०एम०यू०, लखनऊ ने पत्र संख्या-1713/सीएम/टेक्नी०स्पेशि०-2025 दिनांक-29.05.2025 द्वारा कुल 230, इस प्रकार कुल (484+197+230) 911 उपकरणों/फर्नीचरों की तकनीकी विशिष्टियां तैयार कराते हुए दो वर्षों की वैधता अवधि हेतु इस कार्यालय को प्रेषित की गयी है।

डा० शालीन कुमार, अध्यक्ष, सुपर स्पेशियलिटी एवं अन्य अतिविशिष्ट उपकरणों हेतु, विभागाध्यक्ष, एस०जी०पी०जी०आई०, लखनऊ को महानिदेशालय द्वारा कुल 12 पत्र प्रेषित किये जाने

29/5/25  
9.6.2025

के उपरान्त भी सुपर स्पेशियलिटी एवं अन्य अतिविशिष्ट कुल 81 उपकरणों की तकनीकी विशिष्टियां उपलब्ध नहीं करायी गयी है।

डा० शालीन कुमार, अध्यक्ष, सुपर स्पेशियलिटी एवं अन्य अतिविशिष्ट उपकरणों हेतु विभागाध्यक्ष, एस०जी०पी०जी०आई०, लखनऊ द्वारा तकनीकी विशिष्टियां उपलब्ध न कराये जाने के कारण पूर्व में वित्तीय वर्ष 2022-23 से वित्तीय वर्ष 2024-25 तक सुपर स्पेशियलिटी एवं अन्य अतिविशिष्ट उपकरणों हेतु निर्धारित तकनीकी विशिष्टियों की समयावधि एक वर्ष (वर्ष 2025-26 तक) विस्तारित किये जाने हेतु पृथक से पत्र प्रेषित किया जा रहा है।

अतः तकनीकी विशिष्टिता निर्धारण समिति के अध्यक्षों द्वारा उपलब्ध करायी गयी कुल 911 उपकरणों/फर्नीचरों की तकनीकी विशिष्टियां, जो कि 02 वर्षों की वैधता अवधि हेतु प्रेषित की गयी है, को संलग्न कर इस आशय से प्रेषित है कि इन्हें वित्तीय वर्ष 2025-26 तथा वित्तीय वर्ष 2026-27 हेतु, 02 वर्षों के लिए उपकरणों/फर्नीचरों के कय हेतु निर्धारित किये जाने के सम्बन्ध में आवश्यक शासकीय आदेश निर्गत करने का कष्ट करें।

संलग्नक-यथोपरि।

भवदीया



(किंजल सिंह)  
महानिदेशक

पत्रांक संख्या- 65 / एनेस्थीसिया / डा0रा0म0ली0आ0सं0 / 2025

दिनांक-29.05.2025

सेवा में,

महानिदेशक,  
चिकित्सा शिक्षा एवं प्रशिक्षण,  
उत्तर प्रदेश।

विषय-प्रदेश के राजकीय मेडिकल कालेजों/स्वशासी राज्य चिकित्सा महाविद्यालयों/चिकित्सा संस्थानों/चिकित्सा विश्वविद्यालयों में उपकरणों/फर्नीचरों के क्रय हेतु तकनीकी विशिष्टियों का निर्धारण कर अनुमोदन किये जाने के सम्बन्ध में।

महोदय,

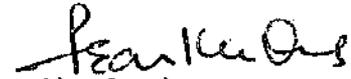
उपर्युक्त विषयक अपने कार्यालय के पत्र संख्या-एमई/पर्वज/2024-25/605 दिनांक-08.11.2024 का संदर्भ ग्रहण करने का कष्ट करें, जिसके द्वारा प्रदेश के राजकीय मेडिकल कालेजों/स्वशासी राज्य चिकित्सा महाविद्यालयों/चिकित्सा संस्थानों/चिकित्सा विश्वविद्यालयों में उपकरणों/फर्नीचरों के क्रय हेतु शासनादेश संख्या-133/2021/आई/112605/2021 दिनांक-03.11.2021 द्वारा 136 उपकरण, शासनादेश संख्या-128/2022/आई/244885/2022 दिनांक-07.12.2022 द्वारा 393 उपकरण एवं शासनादेश संख्या-148/2023/आई/426645/2023 दिनांक-10.11.2023 द्वारा 33 उपकरणों की तकनीकी विशिष्टियां, जिनकी वैधता अवधि वित्तीय वर्ष 2024-25 (मार्च, 2025 तक) तक थी, के अतिरिक्त पूर्व के शासनादेशों क्रमशः दिनांक-28.12.2017, 18.01.2018, 06.03.2018 व 23.08.2018 द्वारा स्वीकृत उपकरणों/फर्नीचरों की विभागवार समेकित सूची संलग्न कर प्रेषित करते हुए वर्ष 2025-26 हेतु तकनीकी विशिष्टियों का निर्धारण किये जाने हेतु प्रेषित की गयी है।

उपरोक्त के क्रम में आपको अवगत कराना है कि क्लिनिकल विषयों से सम्बन्धित कुल 484 उपकरणों/फर्नीचरों की तकनीकी विशिष्टियां संलग्न सूची के अनुसार विषय विशेषज्ञों से निर्धारित कराकर अनुमोदित करते हुए, इस पत्र के साथ संलग्न कर दो वर्षों की वैधता हेतु प्रेषित की जा रही है।

धन्यवाद।

संलग्नक-यथोपरि।

भवदीय



(प्रो पी० के० दास)

अध्यक्ष,

तकनीकी विशिष्टिता निर्धारण समिति,  
विभागाध्यक्ष, एनेस्थीसिया एवं गहन  
चिकित्सा विभाग

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सेवा में,

महानिदेशक,  
चिकित्सा शिक्षा एवं प्रशिक्षण,  
उत्तर प्रदेश।

संख्या- 177/ANAT/2025-26

लखनऊ: दिनांक- 15/06/2025

विषय-प्रदेश के राजकीय मेडिकल कालेजों/स्वशासी राज्य चिकित्सा महाविद्यालयों/चिकित्सा संस्थानों/चिकित्सा विश्वविद्यालयों में उपकरणों/फर्नीचरों के क्रय हेतु तकनीकी विशिष्टियों का निर्धारण कर अनुमोदन किये जाने के सम्बन्ध में।

महोदय,

उपर्युक्त विषयक अपने कार्यालय के पत्र संख्या-एमई/पचेज/2024-25/605 दिनांक-08.11.2024 का संदर्भ ग्रहण करने का कष्ट करें, जिसके द्वारा प्रदेश के राजकीय मेडिकल कालेजों/स्वशासी राज्य चिकित्सा महाविद्यालयों/चिकित्सा संस्थानों/चिकित्सा विश्वविद्यालयों में उपकरणों/फर्नीचरों के क्रय हेतु शासनादेश संख्या-133/2021/आई/112605/2021 दिनांक-03.11.2021 द्वारा 136 उपकरण, शासनादेश संख्या-128/2022/आई/244885/2022 दिनांक-07.12.2022 द्वारा 393 उपकरण एवं शासनादेश संख्या-148/2023/आई/426645/2023 दिनांक-10.11.2023 द्वारा 33 उपकरणों की तकनीकी विशिष्टियां, जिनकी वैधता अवधि वित्तीय वर्ष 2024-25 (मार्च, 2025 तक) तक थी, के अतिरिक्त पूर्व के शासनादेशों क्रमशः दिनांक-28.12.2017, 18.01.2018, 06.03.2018 व 23.08.2018 द्वारा स्वीकृत उपकरणों/फर्नीचरों की विभागवार समेकित सूची संलग्न कर प्रेषित करते हुए वर्ष 2025-26 हेतु तकनीकी विशिष्टियों का निर्धारण किये जाने हेतु प्रेषित की गयी है।

अतः आपके कार्यालय के उक्त पत्र के साथ तकनीकी विशिष्टियों के निर्धारण हेतु संलग्न कर प्रेषित की गयी उपकरणों/फर्नीचरों की सूची के क्रम में अवगत कराना है कि नॉन क्लीनिकल से सम्बन्धित कुल 197 उपकरणों/फर्नीचरों की तकनीकी विशिष्टियां संलग्न सूची के अनुसार विषय विशेषज्ञों से निर्धारित कराकर अनुमोदित करते हुए, पत्र के साथ संलग्न कर दो वर्षों की वैधता हेतु प्रेषित की जा रही है।

संलग्नक-यथोपरि।

भवदीया

P. Manik

(डा० पुनीता मानिक)

अध्यक्ष,

तकनीकी विशिष्टिता निर्धारण समिति,

आचार्य, के०जी०एम०यू०, लखनऊ।

Professor

Department of Anatomy

K.G.'s. Medical University, U.P.

Lucknow

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46	Fully Automated Clinical Chemistry Analyzer	Biochemistry	74
47	PCR	Biochemistry	76
48	Liquid Nitrogen Container	Biochemistry	77
49	HPLC (HbA1c & Hb variants)	Biochemistry	78

#	Equipment Name/Specification Name	Department Name	Page No
50	Ryle's Tube	Biochemistry	80
51	Incubator Electric with Constant Temperature	Biochemistry	81
52	Water Bath	Biochemistry	82
53	Stop Watch	Biochemistry	83
54	Thermometer	Biochemistry	84
55	Spirit Lamp	Biochemistry	85
56	Large Desiccator	Biochemistry	86
57	Digital Thermometer	Biochemistry	87
58	Semi Auto Bio Chemistry Analyzer	Biochemistry	88
59	Gradient Thermal Cycler (PCR Machine)	Biochemistry	89
60	Gas Chromatograph	Biochemistry	90
61	ABG Machine	Biochemistry	91
62	Pipettes of various Size with Disposable Tips	Biochemistry	92
63	Western Blotting Imaging system	Biochemistry	93
64	Digital Colorimeter	Biochemistry	94
65	Analytical Balance (Digital)	Biochemistry	95
66	CorkBorer Set	Biochemistry	96
67	Bottle Dispenser	Biochemistry	97
68	Chromatographic Chamber	Biochemistry	98
69	Gel Documentation system	Biochemistry	99
70	Flow Cytometer	Biochemistry	100
71	Thermal Cycler	Biochemistry	102
72	Decahead with high end optics with HDMI Multioutput photographic camera	Biochemistry	103
73	Trinocular Microscope teaching	Biochemistry	104
74	Thermometer (0°C to 110°C)	Biochemistry	105
75	Hot air oven	Biochemistry	106
76	Urinometer	Biochemistry	107
77	Cytocentrifuge	Biochemistry	108
78	Cytocentrifuge Clinical	Biochemistry	109
79	NIRS Machine	Biochemistry	110
80	Refrigerated High Speed Centrifuge	Biochemistry	111
81	Mini Centrifuge	Biochemistry	112
82	Balance Electronic Digital	Biochemistry	113
83	pH Meter wide range digital	Biochemistry	114
84	Vortex Meter	Biochemistry	115
85	UV Lamp	Biochemistry	116
	Microscope student	Biochemistry	117
86	Double Beam UV visual double Spectrophotometer	Biochemistry	118
87	Electronic Balance 1mg accuracy	Biochemistry	119
88	Small Size desiccator	Biochemistry	120
89	Mechanical Homogenizers	Biochemistry	121
90	Gel Electrophoresis System with power pack	Biochemistry	122
91	Weighing balance	Biochemistry	124
92	Balance Micro (0.1 mg) accuracy	Biochemistry	125
93	Magnetic Stirrer	Biochemistry	126
94	Weighting Balance	Biochemistry	127
95	Laboratory Refrigerator	Biochemistry	128
96	Microscope Binocular	Biochemistry	132
97	Horizontal Electrophoresis system	Biochemistry	134
98	Electric incubator	Biochemistry	136

#	Equipment Name/Specification Name	Department Name	Page No
99	High end binocular microscope	Biochemistry	138
100	Digitally adjusted electronic pipette	Biochemistry	140
101	Flow Cytometer with Cell sorter (higher version)	Biochemistry	142
102	Dale Bath (For Internal Organs)	Physiology	144
103	Isolated Organ Bath (For Student)	Physiology	145
104	Stethoscope With Triple Ear Pieces	Physiology	146
105	Polygraph	Physiology	147
106	Stop Clock	Physiology	148
107	Polygraph (16 Channel)	Physiology	149
108	Starling Kymograph	Physiology	150
109	Physiograph	Physiology	151
110	Large Extension Kymograph	Physiology	152
111	Smoking Outfit	Physiology	153
112	Perimeter (Priestley Smith Type)	Physiology	154
113	Douglas Bag	Physiology	155
114	Dynamometer	Physiology	156
115	Electric Sterilizer	Physiology	157
116	Instrument Trolley	Physiology	158
117	Tuning Fork Time Marker	Physiology	159
118	Simple Electrode (Copper Type)	Physiology	160
119	Gas Analyser (Automatic CO <sub>2</sub> , O <sub>2</sub> , N <sub>2</sub> )	Physiology	161
120	All Glass Distillation Apparatus	Physiology	162
121	Thermometer 0-360° C	Physiology	163
122	Plethysmograph Assorted	Physiology	164
123	Compass	Physiology	165
124	Thermanaesthesia Meter	Physiology	166
125	Alcometer	Physiology	167
126	Olfactometer	Physiology	168
127	Schematic Eye	Physiology	169
128	Phakoscope	Physiology	170
129	Stop Watch	Physiology	171
130	Mosso's Ergograph	Physiology	172
131	Student physiograph, (Single channel with accessories (Digital TFT Screen)	Physiology	173
132	Multi Channel Physiograph, 3 channels, complete with accessories (Digital TFT Screen)	Physiology	174
133	Digital Physiograph (4 Channel)	Physiology	175
134	Perimeter Priestly Smith	Physiology	176
135	Microscopes, Oil Immersion	Physiology	177
136	ECG Machine	Physiology	178
137	Sphygmomanometer (digital) (Mercury based instruments to be replaced with suitable alternatives)	Physiology	179
138	Stethoscopes	Physiology	180
139	Spirometer (ordinary)	Physiology	181
140	Demonstration Eye Piece	Physiology	182
141	Double demonstration eye piece	Physiology	183
142	Hemoglobin-meter Sahli's or Hellige (with spaces)	Physiology	184
143	Hemocytometer	Physiology	185
144	Westergren's pipette for E.S.R. on stand (with space pipette)	Physiology	186
145	Wintrobe's pipette for ESR and PCV with stand	Physiology	187
146	Compass aesthesiometer	Physiology	188
147	Thermo-Aesthesiometer	Physiology	189

#	Equipment Name/Specification Name	Department Name	Page No
148	Algotometer	Physiology	190
149	Electromagnetic Time Marker	Physiology	191
150	Electrodes Copper Wire	Physiology	192
151	Newtons Color wheel	Physiology	193
152	Perimeter with charts (Lister's)	Physiology	194
153	Clinical thermometer (Mercury based instruments to be replaced with suitable alternatives)	Physiology	195
154	Basal Metabolism Apparatus	Physiology	196
155	Stepdown Transformers	Physiology	197
156	Otorhinolaryngoscope	Physiology	198
157	Van Slyko's apparatus manometric	Physiology	199
158	Gas Analysis Apparatus	Physiology	200
159	Stage Incubator	Physiology	201
160	Kymograph Paper	Physiology	202
161	Date Bath (For Internal Organs- 9"*6"*8")	Physiology	203
162	Muscle lever	Physiology	204
163	Heart lever (Simple & Starling)	Physiology	205
164	Sherrington Starling Kymograph (electrically driven)	Physiology	206
165	Bicycle Ergometer	Physiology	207
166	Knee Hammer	Physiology	208
167	Apparatus for Passive Movement	Physiology	209
168	Copper Wire (Double Cotton Covered)	Physiology	210
169	Simple Electrode with Copper	Physiology	211
170	Mary's Tambour	Physiology	212
171	Frog Board for Dissection	Physiology	213
172	Hook and Weight set	Physiology	214
173	Surgical instrument (for operative procedures syringes pulleys etc)	Physiology	215
174	Body Fat Analyser	Physiology	216
175	Physiography system (Automatic function testing system) complete setup	Physiology	217
176	Polygraph (Polygraph Machine for Research Lab)	Physiology	218
177	Spirit Lamps	Physiology	219
178	Glassware & accessories	Physiology	220
179	Digital Balance	Physiology	221
180	Microslides	Physiology	222
181	Electronic stimulator	Physiology	223
182	pH Meter	Physiology	224
183	Stop watches	Physiology	225
184	Short circuiting Key	Physiology	226
185	Vibrating interrupter	Physiology	227
186	Myograph stand	Physiology	228
187	Voltage stabilizer	Physiology	229
188	Oxygen Cylinder with Trolley	Physiology	230
189	All Glass Distillation apparatus double stage	Physiology	231
190	Refrigerator	Physiology	232
191	Stop Watch	Physiology	233
192	Tuning fork (sets-128,256,512 Hz)	Physiology	234
193	Maddox rod	Physiology	235
194	Color perception Lantern (Edridge green)	Physiology	236
195	Ophthalmoscope	Physiology	237
196	Olfactometer	Physiology	238
197	Stethograph	Physiology	239



UPGRADED DEPARTMENT OF COMMUNITY MEDICINE & PUBLIC HEALTH  
King George's Medical University UP, Lucknow

उच्चिकृत सामुदायिक चिकित्सा एवं जन-स्वास्थ्य विभाग  
किंग जॉर्ज चिकित्सा विश्वविद्यालय उ०प्र०, लखनऊ - २२६००३ (भारत)

No. 01713/cm/Tech Spec-2025

Date... 29/05/25

सेवा में,

महानिदेशक  
चिकित्सा शिक्षा एवं प्रशिक्षण,  
उत्तर प्रदेश।

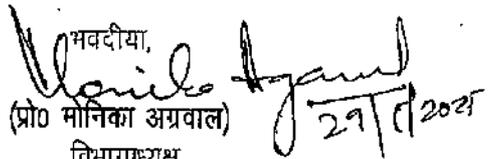
विषय- प्रदेश के राजकीय मेडिकल कॉलेजों/स्वशासी राज्य चिकित्सा महाविद्यालयों/चिकित्सा संस्थानों/ चिकित्सा विश्वविद्यालयों में उपकरणों/फर्नीचरों के क्रय हेतु तकनीकी विशिष्टियों का निर्धारण कर अनुमोदन किये जाने के सम्बन्ध में।

महोदय,

कृपया उपरोक्त विषयक अपने कार्यालय के पत्र संख्या-एम०ई०/पचेज/2024-25/605 दिनांक 08.11.2024 का संदर्भ ग्रहण करने का कष्ट करें, जिसके द्वारा प्रदेश के राजकीय मेडिकल कॉलेजों/स्वशासी राज्य चिकित्सा महाविद्यालयों/चिकित्सा संस्थानों/चिकित्सा विश्वविद्यालयों में उपकरणों/फर्नीचरों के क्रय हेतु शासनादेश संख्या-133/2021/आई०/112605/2021 दिनांक 03.11.2021 दिनांक 03.11.2021 द्वारा 136 उपकरण शासनादेश संख्या-128/2022/आई०/244885/2022 दिनांक 07.12.2022 द्वारा 393 उपकरण एवं शासनादेश संख्या-148/2023/आई०/426645/2023 दिनांक 10.11.2023 द्वारा 33 उपकरणों की तकनीकी विशिष्टियां, जिनकी वैधता अवधि वित्तीय वर्ष 2024-25 (मार्च, 2025 तक) तक थी, के अतिरिक्त पूर्व के शासनादेशों के क्रमशः दिनांक 28.12.2017, 18.01.2018, 06.03.2018 व 23.08.2018 द्वारा स्वीकृत उपकरणों/फर्नीचरों की विभागवार समेकित सूची संलग्न कर प्रेषित करते हुए वर्ष 2025-26 हेतु तकनीकी विशिष्टियों का निर्धारण किये जाने हेतु प्रेषित की गयी है।

अतः आपके कार्यालय के उक्त पत्र के साथ तकनीकी विशिष्टियों के निर्धारण हेतु संलग्न कर प्रेषित की गयी उपकरणों/फर्नीचरों की सूची के क्रम में अवगत कराना है कि पैरा क्लिनिकल से सम्बन्धित कुल 230 उपकरणों/फर्नीचरों की तकनीकी विशिष्टियां संलग्न सूची के अनुसार विषय विशेषज्ञों से निर्धारित कराकर अनुमोदित करते हुए, पत्र के साथ संलग्न कर दो वर्षों की वैधता हेतु प्रेषित की जा रही है।

संलग्नक - यथोपरि।

भवदीया,  
  
(प्रो० मोनिका अग्रवाल)  
29/5/2025  
विभागाध्यक्ष

एवं अध्यक्ष-तकनीकी विशिष्टिता निर्धारण समिति,  
कम्युनिटी मेडिसिन एवं पब्लिक हेल्थ विभाग,  
किंग जॉर्ज चिकित्सा विश्वविद्यालय उ०प्र०, लखनऊ।  
Prof. Monika Agarwal  
Head

#	Equipment Name/Specification Name	Department Name	Page No
1	Dissecting Microscope	Community Medicine	1
2	Microscope with oil immersion lense	Community Medicine	2
3	Centrifuge (Clinical Use)	Community Medicine	3
4	LCD Projector Specification	Community Medicine	4
5	Comparator Nessler	Community Medicine	6
6	RO+UV+UF+TDS Control Water Purifier (AquaGuard)	Community Medicine	7
7	Incubator	Community Medicine	8
8	Spirometer	Community Medicine	9
9	Paper Shredding Machine -Technical Specification	Community Medicine	11
10	Hot Air Oven - Technical Specification	Community Medicine	12
11	Technical Specification of Refrigerator 310 liters	Community Medicine	13
12	Weighing Machine	Community Medicine	14
13	Digital adult Weighing Machine Specification	Community Medicine	15
14	Manual Weighing Machine Adult Specification	Community Medicine	15
15	Stadiometer	Community Medicine	16
16	Measuring Tape upto 7 feet	Community Medicine	17
17	Glucometer	Community Medicine	18
18	BP Instrument (Automated/Digital)	Community Medicine	20
19	Infantometer	Community Medicine	21
20	Barometer (Fortin)	Community Medicine	22
21	Digital Barometer Technical Specification	Community Medicine	23
22	Filter	Community Medicine	24
23	Harpden Skinfold Calipers	Community Medicine	25
24	Height Measuring Stand	Community Medicine	26
25	Hydrometer (Spirit)	Community Medicine	27
26	Hydrometer (Milk)	Community Medicine	27
27	Hydrometer (Wet & Dry bulb)	Community Medicine	27
28	Glassware And Accessories	Community Medicine	28
29	Student-Type Microscope	Forensic Medicine	29
30	Autopsy Table With Integral Sink (Down Draft Ventilated Autopsy Table)	Forensic Medicine	31
31	Autopsy Saw with Accessories	Forensic Medicine	33
32	Weighing Machine for Dead Bodies	Forensic Medicine	35
33	Chemical Balance	Forensic Medicine	36
34	Digital Weighing Machine For Organ/Foetus Specification	Forensic Medicine	37
35	Steel Tape Roll	Forensic Medicine	38
36	Rib Shear	Forensic Medicine	39
37	Weighing Machine	Forensic Medicine	40
38	Dial-Type Human Scale	Forensic Medicine	41
39	Vernier Scale Specification	Forensic Medicine	42
40	Folding Metal Scale to measure upto 7 feet	Forensic Medicine	43
41	Dissecting Instruments	Forensic Medicine	44
42	Hacksaw	Forensic Medicine	45
43	Specification For Teaching Ten Head Microscope	Microbiology	47
44	Specification For Hot Air Oven	Microbiology	49
45	Technical Specification For Laboratory Incubator	Microbiology	50
46	Technical Specification For BOD Incubator	Microbiology	52
47	Technical Specification For CO2 Incubator	Microbiology	54
48	Technical Specification For Vertical Autoclave	Microbiology	56
49	Technical Specification For Binocular Microscope	Microbiology	58
50	Technical Specification For Deep Freezer -20 Deg Cel.	Microbiology	60
51	Technical Specification For Deep Freezer -80 Deg Cel.	Microbiology	61
52	Technical Specification of Monocular Microscope	Microbiology	63
53	Specification For Elisa Reader	Microbiology	64
54	Specification For Elisa Washer	Microbiology	68
55	Specification For Colony Counter	Microbiology	71

#	Equipment Name/Specification Name	Department Name	Page No
56	Specification For Centrifuge	Microbiology	74
57	Specification For Cyto-centrifuge	Microbiology	75
58	Specification For PH Meter	Microbiology	76
59	Technical Specification For Laboratory Refrigerator	Microbiology	77
60	Technical Specification For Anaerobic Jar	Microbiology	79
61	Specification Of Distilled Water Apparatus	Microbiology	80
62	Specification For Balance Electronic Digital	Microbiology	81
63	Specification For Thermal Cycler/PCR	Microbiology	83
64	Specification For Gel Electrophoresis System For Immunofixation, CSF and VWD	Microbiology	85
65	Specification For Vertical Gel Electrophoresis	Microbiology	89
66	VDRL shaker Technical Specification	Microbiology	95
67	Specification For Laminar Flow	Microbiology	97
68	Specification For Serum Inspissators	Microbiology	100
69	Specification For Water Bath	Microbiology	104
70	Specification For Teaching Five Headed Microscope	Microbiology	107
71	Specification For Binocular Pathological Microscope With Image Analyse Camera and Software	Microbiology	109
72	Seriological Water Bath	Pathology	112
73	Research Pipettes	Pathology	113
74	Microscope (Binocular For Clinical use)	Pathology	114
75	Specification of Microscope (Binocular, Advance for clinical use)	Pathology	115
76	Biosafety Cabinet	Pathology	117
77	Tissue embedding centre (Histopathology)	Pathology	118
78	Grossing station table (Histopathology)	Pathology	119
79	Grossing station table with camera (Histopathology)	Pathology	120
80	Automatic Tissue Processor (Histopathology)	Pathology	121
81	Automatic Slide stainer (Histopathology)	Pathology	122
82	Deep Freezer for Keeping tissue	Pathology	124
83	Cryostat / freezing Microtome	Pathology	125
84	Laminar Flow Cabinet	Pathology	126
85	Laboratory Refrigerator	Pathology	127
86	Automatic Tissue Processor ( with vaccum)(Histopathology)	Pathology	128
87	Microtome (Manual Rotary) (Histopathology)	Pathology	129
88	Microtome (Fully Automated Rotary with accessories) (Histopathology)	Pathology	130
89	Cryostat / freezing Microtome	Pathology	131
90	Automatic Tissue Processor (Histopathology)	Pathology	132
91	Rotary Microtome (Automatic) (Histopathology)	Pathology	133
92	Tissue embedding System	Pathology	134
93	Automated Slide Stainer (40Slide)	Pathology	135
94	Centrifuge (Micro-Refrigerated)	Pathology	137
95	Thermo Mixer	Pathology	138
96	Rotary Microtome (Manual)	Pathology	139
97	Rotary Microtome (Fully Automated)	Pathology	140
98	Cryostat	Pathology	141
99	Paraffin Embedding Station	Pathology	142
100	Heated Paraffin Embedding module	Pathology	143
101	Distilled Water Plant (Ultrapure Water)	Pathology	144
102	Multi Strainer Workstation (Fully Automated high Throughput)	Pathology	145
103	Embedding System (Fully Automated Hot & Cold Plate)	Pathology	147
104	Paraffin Dispensing Module Cold Plate (100 Cassette)	Pathology	148
105	Hot Air Oven (100-300°C)	Pathology	149
106	Isolated Bath (Water bath four unit-4 holes)	Pathology	150
107	Grossing Station	Pathology	151
108	Autoclave (Portable)	Pathology	152
109	Chemical Balance	Pathology	153

#	Equipment Name/Specification Name	Department Name	Page No
110	Microscope (Binocular)	Pathology	154
111	Automatic Blood Cell Component Separator) (Blood Cell Separator)	Pathology(Blood Bank)	156
112	Semi Automated Digital Incubator And Digital centrifuge of immunohematology gel card of blood group & Rh	Pathology(Blood Bank)	157
113	Binocular Microscope	Pathology(Blood Bank)	158
114	Stereozoom Microscope	Pathology(Blood Bank)	159
115	Incubator	Pathology(Blood Bank)	162
116	Refrigerated Centrifuge (8 Bags)	Pathology(Blood Bank)	164
117	Centrifuge Bucket Equilizer (to be provided with refrigerated centrifuge)	Pathology(Blood Bank)	166
118	Plasma Expressor (Manual)	Pathology(Blood Bank)	167
119	Plasma Thawing Bath	Pathology(Blood Bank)	168
120	VDRL Shaker	Pathology(Blood Bank)	169
121	Automated Hematology Analyzer	Pathology(Blood Bank)	170
122	Blood Collection Monitor	Pathology(Blood Bank)	172
123	Portable Blood Donor Chair	Pathology(Blood Bank)	173
124	Deep Freezer -80°C	Pathology(Blood Bank)	174
125	Apheresis Machine	Pathology(Blood Bank)	176
126	Platelet Agitator with Incubator	Pathology(Blood Bank)	178
127	Coagulation analyser	Pathology(Blood Bank)	179
128	Automated Blood Grouping System	Pathology(Blood Bank)	180
129	Component Extractor (Fully Automatic)	Pathology(Blood Bank)	182
130	Water Bath	Pathology(Blood Bank)	183
131	Rh Viewing Box	Pathology(Blood Bank)	184
132	Blood bag Tube Sealer	Pathology(Blood Bank)	185
133	Blood Bank Refrigerator	Pathology(Blood Bank)	186
134	Stage Incubator Specification	Pathology(Blood Bank)	188
135	Deep Freezer -40°C	Pathology(Blood Bank)	189
136	Donor Couch automated	Pathology(Blood Bank)	191
137	Respiratory Pump (ideal)	Pharmacology	192

#	Equipment Name/Specification Name	Department Name	Page No
138	Operation Table ( brodi type)		
139	Incubator		
140	Assembly perfusion apparatus (for mamalian heart)	Pharmacology	193
141	Power table(Standard)	Pharmacology	194
142	Assembly for mammalian classes	Pharmacology	195
143	Recording Drum (automatic)	Pharmacology	196
144	Stromuhr (Mechanical)	Pharmacology	197
145	Centrifuge	Pharmacology	198
146	Calorimeter	Pharmacology	198
147	Varnishing (with foot lever)	Pharmacology	201
148	Isolated organ bath ( four unit )	Pharmacology	202
149	Analgesiometer	Pharmacology	204
150	Smoking Burner Palmer	Pharmacology	204
151	Tracheal Cannula	Pharmacology	206
152	Condons Drop recorder	Pharmacology	208
153	Weigning measuring machine for large animals like dogs	Pharmacology	210
154	Weigning measuring machine for small animals like Rats	Pharmacology	211
155	Kemograph student electric independent unit	Pharmacology	212
156	Apparatus for isolated rabbit intestine	Pharmacology	213
157	Jacquest graphic chronometer	Pharmacology	213
158	Frog Board Palmer	Pharmacology	214
159	Hair Aesthesiometer	Pharmacology	214
160	Long extension for paper player	Pharmacology	215
161	Triple beam animal balance	Pharmacology	216
162	Drug specimen jars (for museum)	Pharmacology	216
163	All glass distillation Apparatus (2 Liters)	Pharmacology	216
164	Electric centrifuge	Pharmacology	217
165	Microscope lamps	Pharmacology	218
166	Magnetic stirrer	Pharmacology	219
167	Electric autoclave	Pharmacology	220
168	Warring blender	Pharmacology	220
169	Hot air oven	Pharmacology	222
170	Incubator (electric)	Pharmacology	222
171	Vaccum and pressure pump	Pharmacology	223
172	Instruments steriliser (electric)	Pharmacology	225
173	Bp apparatus dial type	Pharmacology	224
174	Distal water sill manesty (electrical) cap 2 gallon per	Pharmacology	225
175	Stethoscope	Pharmacology	226
176	Multimeter	Pharmacology	226
177	Water Bath (Temperature Controlled 37 degree Celsius)	Pharmacology	226
178	Razone hone	Pharmacology	228
179	Hot plate (electric)	Pharmacology	229
180	Deionizer	Pharmacology	231
181	Vortex Mixer	Pharmacology	231
182	Actophotometer	Pharmacology	232
183	Rota rod assembly	Pharmacology	234
184	Electro convulsive meter	Pharmacology	234
185	Climbing apparatus (cooks pole)	Pharmacology	235
186	Metabolic cages	Pharmacology	236
187	Ph meter (digital)	Pharmacology	237
188	Glass rods ( assorted size of 6ft )	Pharmacology	237
189	Mortar and pestle (glass)	Pharmacology	239
190	Cork borer (set of 12 brass)	Pharmacology	240
191	Holder (for platinum wire loop)	Pharmacology	242
192	Lancet (spring)	Pharmacology	243
		Pharmacology	244
		Pharmacology	245

#	Equipment Name/Specification Name	Department Name	Page No
193	Lamp (for microscope)	Pharmacology	246
194	Magnifying glass (with metal handle)	Pharmacology	247
195	Mincing machine (metal)	Pharmacology	248
196	Postmortum instrument (complete set)	Pharmacology	249
197	Suction pump	Pharmacology	250
198	Filtering Apparatus ( sietz filter and Millipore Filter)	Pharmacology	252
199	Vaccum dessicator	Pharmacology	253
200	Apron (for postmortem plastic)	Pharmacology	254
201	Apron Rubber for Postmortem	Pharmacology	256
202	Colony Counter Electronic Balance	Pharmacology	257
203	Electronic Balance	Pharmacology	258
204	Microfuge	Pharmacology	259
205	Ultracentrifuge	Pharmacology	260
206	Bunsen Burner	Pharmacology	261
207	Boiling Water Bath with Lids Have 8-12 Holes	Pharmacology	263
208	Electrophoresis Automafed System	Pharmacology	264
209	Flash Autoclave	Pharmacology	266
210	Dispencing Balance with Betric System weights	Pharmacology	268
211	Porcelian Dishes	Pharmacology	269
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पत्रांक संख्या- 65 / एनेस्थीसिया / डा0रा0म0लो0आ0स0 / 2025

दिनांक-29.05.2025

सेवा में,

महानिदेशक,  
चिकित्सा शिक्षा एवं प्रशिक्षण,  
उत्तर प्रदेश।

विषय-प्रदेश के राजकीय मेडिकल कालेजों/स्वशासी राज्य चिकित्सा महाविद्यालयों/चिकित्सा संस्थानों/चिकित्सा विश्वविद्यालयों में उपकरणों/फर्नीचरों के कय हेतु तकनीकी विशिष्टियों का निर्धारण कर अनुमोदन किये जाने के सम्बन्ध में।

महोदय,

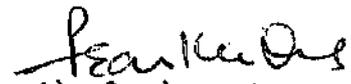
उपर्युक्त विषयक अपने कार्यालय के पत्र संख्या-एमई/पर्चेज/2024-25/605 दिनांक-08.11.2024 का संदर्भ ग्रहण करने का कष्ट करें, जिसके द्वारा प्रदेश के राजकीय मेडिकल कालेजों/स्वशासी राज्य चिकित्सा महाविद्यालयों/चिकित्सा संस्थानों/चिकित्सा विश्वविद्यालयों में उपकरणों/फर्नीचरों के कय हेतु शासनादेश संख्या-133/2021/आई/112605/2021 दिनांक-03.11.2021 द्वारा 136 उपकरण, शासनादेश संख्या-128/2022/आई/244885/2022 दिनांक-07.12.2022 द्वारा 393 उपकरण एवं शासनादेश संख्या-148/2023/आई/426645/2023 दिनांक-10.11.2023 द्वारा 33 उपकरणों की तकनीकी विशिष्टियां, जिनकी वैधता अवधि वित्तीय वर्ष 2024-25 (मार्च, 2025 तक) तक थी, के अतिरिक्त पूर्व के शासनादेशों क्रमशः दिनांक-28.12.2017, 18.01.2018, 06.03.2018 व 23.08.2018 द्वारा स्वीकृत उपकरणों/फर्नीचरों की विभागवार समेकित सूची संलग्न कर प्रेषित करते हुए वर्ष 2025-26 हेतु तकनीकी विशिष्टियों का निर्धारण किये जाने हेतु प्रेषित की गयी है।

उपरोक्त के क्रम में आपको अवगत कराना है कि क्लीनिकल विषयों से सम्बन्धित कुल 484-उपकरणों/फर्नीचरों की तकनीकी विशिष्टियां संलग्न सूची के अनुसार विषय विशेषज्ञों से निर्धारित कराकर अनुमोदित करते हुए, इस पत्र के साथ संलग्न कर दो वर्षों की वैधता हेतु प्रेषित की जा रही है।

धन्यवाद।

संलग्नक-यथोपरि।

भवदीय



(प्रो पी० के० दास)

अध्यक्ष,

तकनीकी विशिष्टिता निर्धारण समिति,  
विभागाध्यक्ष, एनेस्थीसिया एवं गहन  
चिकित्सा विभाग

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294	YAG-CAPSULOTOMY LENS	Ophthalmology	465
295	HAND HELD SLIT LAMP	Ophthalmology	466
296	VITREORETINAL SURGERY VITRECTOMY MACHINE	Ophthalmology	469
297	TTT (TRANSTHERMAL THERMOTHERAPY) Laser	Ophthalmology	471
298	Non Contact Tonometer (NCT)	Ophthalmology	472
299	78 D LENS	Ophthalmology	473
300	3D DIGITAL SURGICAL OPERATING ZOOM MICROSCOPE WITH IMAGE GUIDED SURGICAL SYSTEM	Ophthalmology	474
301	Laser Cataract Surgery System (FEMTO CATARACT SYSTEM)	Ophthalmology	476
302	FEMTOSECOND LASER FOR LENTICULE EXTRACTION	Ophthalmology	477
303	Ultra wide field fundus camera with FFA with inbuilt OCT	Ophthalmology	479
304	GUARDED CALIBRATED DIAMOND KNIFE (FOR LRI)	Ophthalmology	481
305	SPECIFICATION OF SPECULAR MICROSCOPE (EYE BANK FOR DONOR CORNEA)	Ophthalmology	482
306	SPECIFICATION AUTOMATED LAMELLAR DISSECTOR FOR DSAEK	Ophthalmology	483
307	TECHNICAL SPECIFICATION FOR VISUAL ELECTROPHYSIOLOGY SYSTEM	Ophthalmology	484
308	TEFLON BLOCK	Ophthalmology	485
309	CRYOSURGICAL UNITS, OPHTHALMIC (CO2 AND N2O)	Ophthalmology	486
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311	BASIC ARTHROSCOPIC SYSTEM	Orthopaedis	493
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313	BASIC BATTERY OPERATED DRILL SYSTEM	Orthopaedis	498
314	Assorted instruments Orthopaedic	Orthopaedis	500
315	BATTERY DRILL MACHINE IMPORTED (LARGE & SMALL BONE CUTTING SYSTEM)	Orthopaedis	502
316	HIP PRESERVATION SET	Orthopaedis	504
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321	BASIC INSTRUMENT SET (FOR FRACTURE)	Orthopaedis	511
322	MICRO SPINE GENERAL INSTRUMENTS FOR SPINE SURGERIES WITH VERTEBRAL BODY DISTRACTOR	Orthopaedis	514
323	SPINE ENDOSCOPY- INTERLAMINAR WITH ENDOVISION AND ENERGY DEVICES	Pain Medicine (Anaesthesiology)	519
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325	Open Paediatric Surgical Instrument	Paediatric Surgery	529
326	Neonatal Cystoscope ( One Set)	Paediatric Surgery	535
327	Paediatric laparoscopy Set including HD Monitor, Triple chip Camera with recording system and Light source	Paediatric Surgery	538
328	ADVANCED NEONATAL/ PEDIATRIC HIGH FREQUENCY OSCILLATORY (HFO) VENTILATOR	Paediatrics	540
329	HIGH END NEONATAL HFO VENTILATOR	Paediatrics	543
330	BASIC NEONATAL HFO VENTILATOR	Paediatrics	546
331	MEASURING TAPE	Paediatrics	548
332	OPHTHALMOSCOPE (PEDIATRIC)	Paediatrics	549
333	HEMOGLOBIN METER (PORTABLE)	Paediatrics	550
334	THERMOMETER (DIGITAL)	Paediatrics	552
335	WEIGHING MACHINE (NEONATES)	Paediatrics	553

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337	BABY BASSINET	Paediatrics	555
338	DEXTROSTIX	Paediatrics	556
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341	PEAK FLOW METER	Paediatrics	559
342	RECTAL THERMOMETERS	Paediatrics	560
343	URISTIX	Paediatrics	561
344	NEONATAL T PIECE RESUSCITATOR	Paediatrics	562
345	NEONATAL INCUBATOR	Paediatrics	564
346	TRANSPORT INCUBATOR "WITH VENTILATOR"	Paediatrics	567
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348	"ADVANCED" SPECIFICATIONS FOR 7 PARA NEONATAL MONITOR	Paediatrics	573
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353	"BASIC" NEONATAL/PEDIATRIC VENTILATOR	Paediatrics	585
354	SINGLE SURFACE LED PHOTOTHERAPY UNIT	Paediatrics	588
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356	ADVANCED BILIRUBINOMETER	Paediatrics	591
357	TRANSCUTANEOUS BILIRUBINOMETER	Paediatrics	592
358	RADIANT BABY WARMER WITH RESUSCITATION	Paediatrics	592
359	ADVANCED OPEN CARE WARMER WITH RESUSCITATION	Paediatrics	595
360	HIGH END OPEN CARE RADIANT BABY WARMER (WITH RESUSCITATION AND CPAP)	Paediatrics	597
361	BASIC OPEN CARE RADIANT WARMER	Paediatrics	599
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363	SHORT WAVE DIATHERMY UNIT	Physical Medicine & Rehabilitation (PMR)	603
364	BASIC BRONCHOSCOPE SYSTEM	Physical Medicine & Rehabilitation (PMR)	604
365	ADVANCED BRONCHOSCOPE SYSTEM	Pulmonary	607
366	FIBER OPTIC BRONCHOSCOPE (PEADIATRIC)	Pulmonary	610
367	FIBER OPTIC BRONCHOSCOPE (ADULT)	Pulmonary	612
368	BASIC BRONCHOSCOPY SYSTEM (CRYO SYSTEM PULMUNOLOGY BRONCOSCOPY)	Pulmonary	615
369	ADVANCED BRONCHOSCOPY SYSTEM (CRYO SYSTEM PULMUNOLOGY BRONCOSCOPY)	Pulmonary	616
370	BASIC SLEEP LAB SYSTEM(DIGITAL VIDEO POLYSOMNOGRAPHY SYSTEM)	Pulmonary	619
371	HIGH END SLEEP LAB SYSTEM(DIGITAL VIDEO POLYSOMNOGRAPHY SYSTEM)	Pulmonary	621
372	IMPULSE OSCILLOMETRY SYSTEM (IOS)WITH PSG,DIFFUSION STUDY,FOT	Pulmonary	624
373	COPE PLEURAL BIOPSY NEEDLE	Pulmonary	628
374	PREMIUM REAL TIME 4D COLOUR DOPPLER ULTRASOUND SYSTEM FOR OBSTETRICS AND GYNAECOLOGY (FOR CENTRE WITH HIGH VOLUME OBSTETRIC ULTRASOUND WORKLOAD)	Radiology	629
375	COMPUTED RADIOGRAPHY SYSTEM WITH DRY LASER IMAGER	Radiology	638

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377	SPECIFICATION FOR DIGITAL MOBILE RADIOGRAPHY SYSTEM WITH FLAT PANEL DETECTOR	Radiology	642
378	TECHNICAL SPECIFICATION OF DIGITAL MAMMOGRAPHY	Radiology	644
379	SPECIFICATION FOR DIGITAL RADIOGRAPHY SYSTEM (1000 MA) WITH TWO FLAT PANEL DETECTORS	Radiology	648
380	DIGITAL RADIOGRAPHY FLUOROSCOPY SYSTEM WITH FLAT PANEL DETECTOR	Radiology	655
381	BASIC COLOR DOPPLER ULTRASOUND EQUIPMENT	Radiology	660
382	MID END COLOR DOPPLER ULTRASOUND EQUIPMENT	Radiology	663
383	UPPER MID END COLOR DOPPLER ULTRASOUND SYSTEM WITH REAL TIME 2D SHEAR WAVE ELASTOGRAPHY	Radiology	667
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386	TOMO-MAMMOGRAPHY/TOMOSYNTHESIS GUIDED BREAST BIOPSY UNIT (Superspecialist Department)	Radiology	685
387	300 MA FIX X-RAY MACHINE WITH HORIZONTAL TABLE & WALL MOUNT CHEST STAND	Radiology	691
388	DIGITAL RADIOGRAPHY SYSTEM (300 MA) WITH SINGLE DETECTOR	Radiology	694
389	500 MA FIX X-RAY MACHINE WITH HORIZONTAL TABLE & WALL MOUNT CHEST STAND	Radiology	698
390	SPECIFICATION FOR DIGITAL RADIOGRAPHY SYSTEM (500 MA) WITH TWO DETECTORS (i)	Radiology	701
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392	128 SLICE CT SCAN	Radiology	712
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399	ACLS MANIKIN NEONATE	Simulation	747
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401	ACLS MANNEQUIN PEDIATRIC	Simulation	751
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405	BLS MANIKIN CHILD	Simulation	756
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409	MANNEQUIN FOR DEMONSTRATION OF INTRAVENOUS INJECTION	Simulation	768
410	VARIOUS ITEMS MEDICAL EDUCATION DEPARTMENT, SKILL LAB	Simulation	769
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416	ARTERY FORCEPS	Surgery	796
417	ASSORTED MISC INSTRUMENTS FOR MINOR OT	Surgery	797
418	BASIC INSTRUMENT SET (SURGERY) or SURGICAL INSTRUMENT SET	Surgery	799
419	BED PAN	Surgery	803
420	BOWL STERILIZER (LARGE)	Surgery	804
421	BOWL STERILIZER (MEDIUM)	Surgery	805
422	Advanced C ARM (MOBILE)	Surgery	806
423	Basic C ARM (MOBILE)	Surgery	809
424	CAUTERY MACHINE or SURGICAL DIATHERMY MACHINE or ELECTROCAUTERY MACHINE	Surgery	812
425	ELECTROSURGICAL UNIT WITH VESSEL SEALER	Surgery	814
426	CHEATLE FORCEPS	Surgery	816
427	CIDEX CHAMBER	Surgery	817
428	CUSA EQUIPMENT	Surgery	818
429	DRESSING DRUM 9 X 11 INCHES	Surgery	820
430	DRESSING DRUM 12 INCHES	Surgery	821
431	DRUM 15 INCHES x 12 INCHES	Surgery	822
432	DRESSING INSTRUMENT SET (SURGERY)	Surgery	823
433	DRUM STERILIZER SET	Surgery	825
434	ENDO STAPLERS	Surgery	826
435	ENDOSCOPES (SEMI RIGID VIDEO THORACOSCOPE) or THORACOSCOPE (SEMI RIGID PLEURAVIDEOSCOPE)	Surgery	827
436	ENDOSCOPY SYSTEM (ENDOVISION SET)	Surgery	829
437	ENDOSCOPY SYSTEM (HIGH-DEFINITION CAMERA SYSTEM)	Surgery	832
438	ENDOSCOPY SYSTEM (HIGH END 4 K LAPAROSCOPY SYSTEM WITH ICG NIR)	Surgery	833
439	ENDOSCOPY UNIT (LAPAROSCOPIC TROCARS & TELESCOPES)	Surgery	838
440	ENDOSCOPY UNIT (LOWER GI - HD) or COLONOSCOPE	Surgery	840
441	ENDOSCOPY UNIT (UPPER GI-HD) or VIDEODUODENOSCOPE or ESOPHAGOSCOPE	Surgery	842
442	EQUIPMENT TRAY (12 X 10)	Surgery	844
443	EQUIPMENT TRAY (12 X 15)	Surgery	845
444	FORCEPS	Surgery	846
445	HEIGHT SCALE	Surgery	848
446	ICD TRAY	Surgery	849
447	INCISION & DRAINAGE SET (SURGERY)	Surgery	850
448	INSTRUMENT SET (VATS SURGERY)	Surgery	851
449	KIDNEY TRAY	Surgery	854
450	LACERATION SET (SURGERY) or SUTURING & SUTURE REMOVAL SET	Surgery	855
451	LAPAROSCOPIC SURGERY HAND INSTRUMENTS	Surgery	856
452	LAPAROSCOPIC SURGERY SET (PEDIATRIC) or ENDOSCOPES (PEDIATRIC LAPAROSCOPY INSTRUMENTS) or ENDOSCOPES (PEDIATRIC LAPAROSCOPY SET)	Surgery	858
453	LAPAROSCOPIC SURGERY SYSTEM (HD) or ENDOSCOPY SYSTEM or HD LAPAROSCOPY SET or ENDOVISION SET or LAPAROSCOPIC SET(GENERAL)	Surgery	862
454	LIGHT SOURCE (XENON TYPE)	Surgery	866
455	MEDICAL GRADE LAPAROSCOPIC MONITOR	Surgery	867
456	MOSQUITO FORCEPS	Surgery	868
457	NEEDLE HOLDER	Surgery	869
458	Basic OT LIGHT (DOUBLE DOME - LED TECHNOLOGY)	Surgery	870

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459	Advanced OT LIGHT (DOUBLE DOME-LED TECHNOLOGY)		
460	OT LIGHTS (PORTABLE-DOUBLE DOME)	Surgery	872
461	Basic OT TABLE (MOTORISED) or MOTORISE ELECTRO-HYDROLIC SLIDING TABLE	Surgery	874
462	Advanced OT TABLE (MOTORISED) or MOTORISE ELECTRO-HYDROLIC SLIDING TABLE	Surgery	876
463	PEDIATRIC BASIC INSTRUMENT SET (SURGERY)	Surgery	878
464	PEDIATRIC CYSTOSCOPE SET	Surgery	880
465	PNEUMATIC TOURNIQUET DIGITAL	Surgery	883
466	PROCTOSCOPE & GABRIEL SYRINGE	Surgery	886
467	PUNCH BIOPSY FORCEPS	Surgery	887
468	RETRACTOR SET or HAND INSTRUMENTS (FOR RETRACTION PROCEDURE)	Surgery	888
469	SIMS SPECULUM	Surgery	889
470	SURGICAL INSTRUMENTS (ASSORTED MISC INSTRUMENTS FOR MINOR OT) or SURGICAL SMALL INSTRUMENTS SET	Surgery	890
471	SURGICAL INSTRUMENTS (GENERAL TRAUMA SET)	Surgery	891
472	SURGICAL INSTRUMENTS (MISCELLANEOUS)	Surgery	893
473	SURGICAL WORKSTATION WITH APC or SURGICAL WORKSTATION (HIGH END WITH ALL ACCESSORIES)	Surgery	898
474	ULTRASONIC AND VESSEL SEALER DEVICE or ULTRASONIC ENERGY SOURCE or HARMONIC MACHINE WITH VESSEL SEALER	Surgery	900
475	VULSELLUM FORCEPS	Surgery	903
476	WEIGHING MACHINE	Surgery	905
477	Endoscopes (SEMIRIGID URETERO-RENSCOPE)	Surgery	906
478	Endoscopy unit with Harmonic machine (CYSTOSCOPE, RESECTOSCOPE, PNEUMOLITHOTRIPTOR PROBE & ADVANCED BIPOLAR AND ULTRASONIC ENERGY GENERATOR)	Urology	907
479	Endoscopes (NEPHROSCOPE)	Urology	908
480	MINI NEPHROSCOPE	Urology	910
481	Surgical Instruments (URETHROTOMY SET)	Urology	911
482	INTRA CORPOREAL PNEUMATIC LITHOTRIPTOR (LITHOCLAST)	Urology	912
483	Endoscopes (PEDIATRIC CYSTO-URETHROSCOPY SET)	Urology	913
484	URETERSCOPE	Urology	915
		Urology	917

**Anaesthesia  
Critical Care  
Emergency  
Medicine**



**Declaration Certificate about Technical Specifications  
related to Department of Anaesthesiology by  
committee members**

SR. NO.	NAME OF EQUIPMENT	GO NUMBER	APPROX. COST
1.	BIPAP (BASIC)	GO-28-DEC-17 SUCHI-1	1.7 LACS
	BIPAP (ADVANCED)		3 LACS
2.	BASIC MONITOR	GO-28-DEC-17 SUCHI-1	2-3 LACS
	HIGH END MONITOR	GO-7-DEC-2022	6 - 7 LACS
	ADVANCED MONITOR	GO-7-DEC-2022	10 - 12 LACS
		GO-7-DEC-2022	
3.	FOWLER BED ELECTRIC	GO-28-JAN-18 SUCHI-2	75,000
	BASIC ICU BED	GO-7-DEC-2022	1.5 LACS
	ADVANCED ICU BED	GO-7-DEC-2022	4 LACS
		GO-28-DEC-17 SUCHI-1	
4.	VENTILATOR (TRANSPORT/PORTABLE )	GO-28-DEC-17 SUCHI-1	15L
		GO-7-DEC-2022	
5.	BASIC ICU VENTILATOR	GO-28-DEC-17 SUCHI-1	12-15 LACS
	HIGH END ICU VENTILATOR	GO-7-DEC-2022	18-20 LACS
	ADVANCED ICU VENTILATOR	GO-7-DEC-2022	30 LACS
6.	BASIC ANAESTHESIA WORK STATION	GO-7-DEC-2022	18-20LACS
	HIGH END ANAESTHESIA WORK STATION	GO-7-DEC-2022	40 - 45 LACS
	ADVANCED ANAESTHESIA WORK STATION	GO-06-MAR-18 SUCHI-3	70-75 LACS
7.	OXYGEN CONCENTRATOR 5 L	GO-23-AUG-18 SUCHI-4	70,000
	OXYGEN CONCENTRATOR 10 L		1 LACS
8.	BASIC ECG MACHINE	GO-28-DEC-17 SUCHI-1	1 LACS
	ADVANCED ECG MACHINE	GO-7-DEC-2022 GO-7-DEC-2022 GO-28-JAN-18 SUCHI-2	2.5 LACS
9.	AMBU BAG (CHILD)	GO-28-JAN-18 SUCHI-2	3000/-
	AMBU BAG (ADULT)	GO-23-AUG-18 SUCHI-4	3000/-
	AMBU BAG (NEONATE)		3000/-
10.	BASIC INFUSION PUMP (SYRINGE)	GO-28-DEC-17 SUCHI-1	30,000
	HIGH END INFUSION PUMP (SYRINGE)	GO-7-DEC-2022	90,000
	ADVANCED INFUSION PUMP WITH TCI FACILITY		3 LACS
11.	VENTILATOR (MRI COMPATIBLE TRANSPORT TYPE)	GO-28-DEC-17 SUCHI-1 GO-7-DEC-2022	40 LACS
12.	JET NEBULIZER	GO-23-AUG-18 SUCHI-4	10,000
	ULTRASONIC NEBULIZER	GO-23-AUG-18 SUCHI-4	50,000
	VIBRATING MESH NEBULIZER	GO-7-DEC-2022 GO-28-JAN-18 SUCHI-2	50,000
13.	HIGH END PORTABLE ULTRASOUND WITH ECHO FACILITY	GO-28-JAN-18 SUCHI-2	35 LACS
	BASIC PORTABLE ULTRASOUND		25 LACS

Dr. O.P. Sanjeev  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow



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	WIRELESS HANDHELD ULTRASOUND WITH ECHOCARDIOGRAPHY		13 LACS
	WIRELESS HANDHELD ULTRASOUND WITH CONVEX AND LINEAR PROBE		13 LACS
14.	DEFIBRILLATOR	GO-28-DEC-17 SUCHI-1	4 LACS
	AUTOMATIC CPR WITH DEFIBRILLATOR	GO-23-AUG-18 SUCHI-4 GO-7-DEC-2022 GO-7-DEC-2022	65 LACS
15.	CRASH CART	GO-7-DEC-2022	50,000 - 75,000/-
16.	LMA SET	GO-23-AUG-18 SUCHI-4 GO-7-DEC-2022	20,000/-
17.	PCA PUMP	GO-28-DEC-17 SUCHI-1 GO-7-DEC-2022	5 LACS
18.	DVT PUMP WITH SLEEVES	GO-28-DEC-17 SUCHI-1 GO-1/11/2605/2021 GO-7-DEC-2022	1.5 LACS
19.	PATIENT WARMER	GO-7-DEC-2022	2 - 3 LACS
20.	LARYNGOSCOPE (ADULT & PEDIATRIC)	GO-28-JAN-18 SUCHI-2 GO-28-DEC-17 SUCHI-1	5000/-
	BASIC VIDEO LARYNGOSCOPE	GO-7-DEC-2022	5 LACS
	ADVANCED VIDEO LARYNGOSCOPE		21 LACS
21.	AIR MATTRESS	GO-1/11/2605/2021	2000/-
22.	RESUCITATION TRAY/KIT	GO-23-AUG-18 SUCHI-4 GO-23-AUG-18 SUCHI-4	25,000/-
23.	MECHANICAL CHEST COMPRESSION SYSTEM FOR CPR	GO-7-DEC-2022	15 LACS
24.	SPIROMETER SYSTEM	GO-28-JAN-18 SUCHI-2	5 LACS
25.	BIOREACTANCE NON-INVASIVE FLUID MANAGEMENT MONITORING SYSTEM	GO-7-DEC-2022	20 LACS
26.	BLOOD & FLUID WARMER	GO-7-DEC-2022 GO-7-DEC-2022 GO-06-MAR-18 SUCHI-3 GO-28-DEC-17 SUCHI-1	(150L)- 2.5 LACS, (250L)- 3.5 LACS (400L)- 4LACS
	BROAD BASED QR FOR TOTAL TEMPERATURE MANAGEMENT WITH BLANKET		3 LACS
27.	INTEGRATED PULMONARY LAB/ PFT SYSTEM WITH SPIROMETRY & LUNG DIFFUSION (DLCO)	GO-23-AUG-18 SUCHI-4 GO-23-AUG-18 SUCHI-4	40 LACS
28.	OXYGEN FLOW METER	GO-23-AUG-18 SUCHI-4	3000 - 5000/-
29.	CARDIOPULMONARY EXERCISE TESTING SYSTEM (CPET)	GO-7-DEC-2022	50 LACS
30.	HIGH FLOW NASAL OXYGEN	GO-7-DEC-2022	5 LACS

**Dr. O.P. Sanjeev**  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

**Dr. Jitendra Singh Chahar**  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

**Prof. P.K. Das**  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow



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	THERAPY DEVICE (HFNO)		
31.	SURGICAL SCRUB SINK (2 BAY)	GO-7-DEC-2022 GO-7-DEC-2022	5 LACS
32.	INFUSION PUMP (VOLUMETRIC)	GO-28-DEC-17 SUCHI-1 GO-7-DEC-2022	2 LACS
33.	MOBILE AIRWAY BRONCHOSCOPE	NEW ADDITION	16 LACS
34.	INTEGRATED DIFFICULT AIRWAY SCOPE SYSTEM	NEW ADDITION	55 LACS
35.	INTEGRATED DIFFICULT AIRWAY CART	NEW ADDITION	70 – 75 LACS
36.	NEUROMUSCULAR MONITOR	NEW ADDITION	3 LACS
37.	MRI COMPATIBLE ANAESTHESIA MACHINE	NEW ADDITION	70 LACS
38.	PORTABLE HAND HELD X-RAY MACHINE	NEW ADDITION	45 LACS
39.	ABG MACHINE	NEW ADDITION	10 LACS
40.	INTRAOSSIOUS ACCESS DEVICE	NEW ADDITION	10,000/-
41.		NEW ADDITION	

This is to certify that technical specification of all the above-mentioned machine/instruments, approved by the technical committee is not of any specific company. The technical features of the equipment/instruments from all reputed firms in the current market have been included in this specification to the best of my knowledge and belief & in the opinion of the technical committee.

The technical specification duly signed by the technical committee members is attached herewith.

  
Dr. Jitendra Singh Chahar  
Assistant Professor  
SGPGIMS, Lucknow

Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

  
Dr. Anil Kumar Verma  
Professor

College, Kanpur

जी.एस.जी.एम. मेडिकल कॉलेज  
कानपुर

  
Dr. O.P. Sanjeev  
Associate Professor  
SGPGIMS, Lucknow

  
Prof. P.K. Das  
Chairman

Technical specifications committee  
Clinical Subjects & others

Head, Department of Anesthesiology & CCM  
DR RMLIMS, Lucknow

**Basic BiPAP**  
(For use in General Wards)

1. Non Invasive ventilation support system to ensure proper ventilation to COPD patients.
2. It should be suitable for Adult and Paediatric patients.
3. Modes of operation: CPAP, Spontaneous, S/T, Time Mode and Pressure Control, Volume assured pressure support.
4. It should have display to monitoring facility for Tidal Volume, RR, Minute ventilation, I:E ratio.
5. Operating pressure range of IPAP: 4 to 30 cm H<sub>2</sub>O or more
  - a) EPAP: 2 to 30 cm H<sub>2</sub>O or more
  - b) CPAP: 4 to 20 cm H<sub>2</sub>O or more
6. Unit should be capable of delivering Tidal Volume 1500 ml or more and have option to deliver guaranteed tidal volume.
7. Breath rate should be able to set up 50 BPM with Ti of 0.5 to 3 sec. and rise time 100ms to 600ms.
8. Sensitivity settings: should have trigger and cycle setting.
9. Unit should have integrated alarm for power, pressure (high/low), Low minute ventilation, Apnea, Circuit disconnection etc. with digital technology for improved leak compensation during inspiration & exhalation.
10. Complete unit should be supplied with a good quality reusable bag or box for equipment safe.
11. Unit should have external battery backup capacity of 2 hour or more.
12. Should have remote monitoring option for data monitoring and patient's report preparation.

**Certification:**

- a) ISO 13485:2016
- b) IEC 60601-1 Classification, Class II (double insulation), type BF Continuous operation
- c) USFDA & EU CE from notified body.

**Scope of supply:**

- a) Patient circuit- 2 nos.
- b) Oxygen connector- 2 nos.
- c) Full-face mask (S, M, L) - 2 nos. each.
- d) Fio<sub>2</sub> monitoring accessories- 1 no.

डा० अनिल कुमार वर्मा  
सहपाठ  
एनेस्थीसियोलॉजी, क्रिटिकल केयर  
एवं पेन मेडिसिन  
जी.एस.वी.एम. मेडिकल कॉलेज  
कानपुर

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

Dr. O.P. Sanjeev  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Advanced BiPAP Machine

(For use in HDUs and ICUs)

1. Non-Invasive Ventilator having invasive application capabilities for Adult and Pediatrics usage (above 15 Kgs).
2. It should be a light & compact device combining unique latest NIV features with simplicity in use.
3. Modes of Ventilation: S/T (Spontaneous/Timed), PAC (Pressure Assisted Control), CPAP (Continuous Positive Airway Pressure), S (Spontaneous), T (Timed).
4. Should incorporate latest algorithms for leak compensation and synchronization. Both should work together to provide control and flexibility to improve ventilation, comfort and sleep better disease management, increased patient comfort and therapy acceptance (patient's breathing 'in sync' with their device)
5. It should have colour screen for real-time monitoring to provide essential information including simultaneously viewed flow and pressure curves, the Ti-bar graph to fine-tune ventilation and FiO<sub>2</sub> monitoring.
6. The machine should have a choice of disease-specific preset values Defaults (for obstructive, restrictive, normal lung mechanics and obesity hypoventilation) based on commonly used clinical values to help the users for optimizing settings.
7. Should have built in internal battery for minimum 2 hours of back up time.
8. Should include user adjustable alarms and essential non-adjustable, fixed alarms for patient safety
9. Should have oxygen inlet port to accept higher flow up to 30 L/min of oxygen to achieve a high FiO<sub>2</sub> with built in FiO<sub>2</sub> monitoring.
10. Data Download capability – The usage and summary data for up to 365 treatment sessions and seven days of high resolution, breath-by-breath data should be stored in the device; data can be download via USB or cable, using a data management PC application.
11. It should also provide patient reminders, such as filter and mask replacements.

  
Dr. Jitendra Singh Chahar

Assistant Professor

Department of Critical Care Medicine

S.G.P.G.I.M.S., Lucknow

डा० अनिल कुमार वर्मा

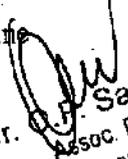
आचार्य

एनेस्थीसियोलॉजी, इन्टेंसिव कैंयर

एच पेन मेडिसिन

जी.एस.जी.एम. मेडिकल कॉलेज

कानपुर

  
Dr. O.P. Sanjeev  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

12. The NIV should comply with following technical specifications:

- Pressure range: IPAP:2-40 cm H<sub>2</sub>O & EPAP:2-25 H<sub>2</sub>O
- Ti-Control setting: Ti Max 0.1-4 & Ti Min 0.1-Ti Max
- Respiratory Rate:5-55bpm
- Rise Time: Min 130-900 m sec
- Trigger and Cycle: Min 5 sensitivity setting

13. Adjustable alarms:

High leak, Low Minute Ventilation, High Pressure, Low Pressure, Low/High Respiratory Rate, Apnoea, Low/High Fio<sub>2</sub>, Non -Vented Mask.

14. Standard fixed alarms:

Circuit disconnected, over pressure, Block tube, internal Battery empty

15. Weight: Less than 4 Kgs

16. Air filters: Electrostatics fiber mesh

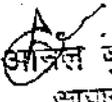
**Certification:**

- ISO 13485:2016
- IEC 60601-1 Classification, Class II (double insulation), type BF Continuous operation
- USFDA & EU CE from notified body.

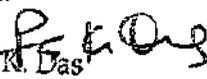
**Scope of supply:**

- Patient circuit- 2 nos.
- Oxygen connector- 2 nos.
- Full-face mask (S, M, L) - 2 nos. each.
- Fio<sub>2</sub> monitoring accessories- 1 no.

  
Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

  
डा० अनिल कुमार वर्मा  
अध्यापक  
एनेस्थीसियोलॉजी, क्रिटिकल केयर  
एजेंट मेडिसिन  
जी.एस.वी.एम. मेडिकल कॉलेज  
कानपुर

  
Dr. O.P. Sanjeev  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Basic Monitor

(For HDU/ Ward, Trauma & Emergency)

1.	Should be suitable for adult, paediatric and neonatal patient monitoring.
2.	Should have 12" Display with touchscreen/ rotary knob for multi-functionality
3.	It should have 5-Lead ECG, Spo2 (Nellcor / Masimo or Equivalent), Perfusion Index (PI) and it can work in low perfusion, NIBP, Respiration Rate, Temperature.
4.	It should have minimum 8 waveforms simultaneously
5.	The monitor should have 2IBP monitoring as a standard with required accessory.
6.	Monitor should be able to measure PPV parameters to guiding fluid therapy for patient on Mechanical ventilation
7.	Grid/Graph mode for ECG display
8.	It should have 3 Lead ST Segment analysis and arrhythmia monitoring
9.	SpO2 Transducer should be Dual wavelength LED having measuring range from 35 to 100%.
10.	Apnoea Alarm from 5 to 120 from user selectable ECG lead 1 or ECG lead 2.
11.	NIBP in mmHg/kPa from 30 to 260 mmHg with Manual, Stat, Auto mode along with customised Multicycle mode.
12.	Respiratory Rate from 0 to 120 rpm
13.	Temperature from 15 to 45 Degree
14.	It Should have records of 2000 or more arrhythmia events, 2000 NIBP readings, 72 or more hours of ECG waveforms storage, 2000 or more Alarm Events storage, 2000 or more Spo2 readings
15.	Should have graphical and tabular trend of 148 hours or more
16.	Single button pre-configured various screen layouts for easy visibility in different working conditions
17.	Battery back-up should be 2 hours
18.	Data export and connectivity to Central Monitoring Station
19.	Network capability through LAN for Central Monitoring
20.	Should have Defibrillator and ESU protection
21.	Monitor Should be HL7 Compliant
	<b>Certifications:</b> <ol style="list-style-type: none"> <li>1. The monitor should be US FDA / EU CE Notified/ BIS approved IS with CML number.</li> <li>2. The manufacturer should be ISO13485:2016 approved from IAF approved notified body.</li> <li>3. The quoted model should be CDSCO approved for Manufacturer or Importer</li> </ol>
	<b>Upgradability features:</b> <ol style="list-style-type: none"> <li>1. Cardiac Output</li> <li>2. 12 Lead ECG should be available as an option.</li> <li>3. ETCO2 Monitoring</li> </ol>
	<b>Scope of supply:</b> <ol style="list-style-type: none"> <li>4. ECG Cable &amp; ECG 5 Leads wire for adult - 1 set</li> <li>5. SpO2 Sensor Adult - 1 No</li> <li>6. SpO2 Sensor Pediatric - 1 No</li> </ol>

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

डा० अजित कुमार वर्मा  
आचार्य  
एनेस्थीसियोलॉजी, क्रिटिकल केयर  
एवं पेन मेडिसिन  
जी.एस.जी.एम. मेडिकल कॉलेज  
काशीपुर

Dr. P. Sanjeev  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

	<p>7. NIBP Hose- 1 No        8. NIBP cuff Adult – 1 box        9. NIBP cuff Pediatric – 1 box        10. Dual Temp rectal and skin Probe- 1 each        11. Dual IBP interface Cable with 10 transducer set- 1 No        12. Wall Mount – 1 set</p>	
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 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.R.G.I.M.S., Lucknow

  
 Dr. O.P. Sanjeev  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

  
 डा० अनिल कुमार वर्मा  
 आचार्य  
 एनेस्थीसियोलॉजी, क्रिटिकल केयर  
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 जी.एस.वी.एम. मेडिकल कॉलेज  
 कानपुर

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## Advanced monitor

(Intended to be used in high end ICUs of tertiary care centres)

1. High-end modular monitor should have Adult, Pediatric and Neonatal applications with facility of freely exchangeable modules with data transmission facility
2. Should be user friendly with full touch screen operation.
3. The monitor should have 19 inch color TFT/LCD display, screen resolution at least 1280 x 1024 pixels
4. It should be capable of monitoring ECG, Two invasive blood pressure, non-invasive blood pressure, oxygen saturation (SpO<sub>2</sub>), perfusion index, dual temperature, as standard.
5. The monitor should have display of 08 or more waveform simultaneously. The operator should be able to freeze the waveform at will.
6. Should be capable to connect to a slave display
7. The color of each individual curve should be freely selectable.
8. Main monitor must be supplied with power backup for 30 min at least (UPS)
9. The monitor should have facility for enlarge numeric display for distance viewing with multiple layout of screen.
10. Monitors should have facility to store and display last 48 hours or more full disclosure of waveforms directly or through central station.
11. Should have a facility to deactivate all the alarms if necessary.
12. Should have event recall minimum up to 24 hours Trend, graphical and tabular trends, alarm logs and able to take print out using network printer.
13. Should display latest trend graph of at least 10 minutes on main screen along with real-time waveform and numerical values.
14. It should have facility to display real time data and alarms of other bedside monitors.

### ECG monitoring essential specification:

1. Available leads: I, II, III, V, AVR, AVF with facility for recording 5 lead ECG.
2. Should display at least two or more selected leads at a time.
3. Accuracy of  $\pm 2$  beat/min.
4. Should efficiently filter out the ESU disturbances and defibrillation protection.
5. Should have ST segment analysis with ST map review for each ECG lead.
6. Should have arrhythmia monitoring facility for up to 20 arrhythmias types. It should store and display the number of arrhythmias occurred in last 48 hours with ECG segment.
7. Should have user selectable alarms.
8. Heart rate measured ranges 20-300 or more beats/min.
9. Display sweep speeds 6.25, 12.5 and 25 mm/sec, measured by the same ECG lead

### Pulse Oximeter (SpO<sub>2</sub>) :

1. Should provide a digital value of the arterial oxygen saturation as well as diagnostic plethysmograph pulse waveform, perfusion index display.
2. Measurement range 0% to 100% +/-2% (80-100%) accuracy.
3. User selectable upper and lower alarm limits.
4. Should have Massimo/Nellcor/Equivalent technology to work well in low perfusion and motion Artifacts.
5. Should provide the clinical data/reports in support for the accuracy of SPO<sub>2</sub> in low Perfusion.

Dr. Jitendra Singh Chahar

Assistant Professor

Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow  
Dr. Anil Kumar Verma  
Associate Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

डा. अनिल कुमार वर्मा

आचार्य

एनेस्थीसियोलॉजी, क्लिनिकल केयर  
एवं पेन मेडिसिन  
जी.एस.डी.एम. मेडिकल कॉलेज  
कानपुर

Prof. P.K. Das

Professor & Head

Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**Respiration :**

1. Range 0-150 breaths/min
2. Accuracy :  $\pm 2$  breaths/min
3. Should have an apnea alarm.

**Invasive pressure monitoring:**

1. Should have the ability to measure and display minimum two or more invasive pressure value with waveforms.
2. Should have facility to measure and display pulse pressure variation from arterial pressure waveform.
3. User selectable upper and lower alarm limits.
4. Measuring range: 0 to 300 mm Hg.
5. Accuracy :  $\pm 1$  mmHg

**Non-Invasive blood pressure (NIBP) monitoring:**

1. Range: 0-280 mm Hg for adults and 0-200 pediatric.
2. Manual, auto and time limited with user selectable automatic time intervals, stats mode.
3. Accuracy:  $\pm 3$ mm Hg

**Network integration**

1. Monitor should be HL7 compliant and able to connect to hospital information system
2. Monitor should be IT enabled for single point access to web based applications (like X- ray, DICOM, HIS. Should give direct access to Web-based applications/ digital connectivity solution.

**The monitoring should be Upgradable to**

1. Cardiac output ,minimal invasive continuous cardiac output (CCO)
2. ETCO<sub>2</sub>
3. IBP, PVI and hemoglobin (SpHb) must be submitted (third party device integration will not be accepted)
4. NMT
5. BIS/EEG
6. Transport module having an inbuilt full touch display of a minimum of 5 inches or more that can be used for transfer of connected parameters (ECG, SpO<sub>2</sub>, NIBP, two IBP and temp) on patient without disconnected the cables/accessories to other bedside monitor. The transport module should have its own battery backup of 4-5 hours.
7. Integrated automated charting system of same make

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

डॉ० अनिल कुमार वर्मा  
आचार्य  
एनेस्थीसियोलॉजी, क्लिनिकल फेजर  
एन पीन मेडिसिन  
एन पीन मेडिसिन, क्लिनिकल फेजर  
एन पीन मेडिसिन

Dr. G.P. Sanjeev  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

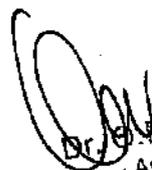
**Certificates**

1. The unit should be US FDA and European CE from notified body.
2. IEC-6060-1
3. The quoted model should be CDSCO approved for Manufacturer or Importer

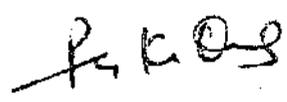
**Scope of Supply with each monitor**

- a. 5 Lead ECG cable 1 No.
- b. Adult /Pediatric SpO2 probe – 1 No.
- c. NIBP cuffs for Adult, Pediatrics and neonates – 1 no each
- d. Temp Probe – 2 Nos. (esophageal and surface)
- e. IBP connections cable – 2 Nos.
- f. IBP Disposable Pressure Transducers – 5 Nos

  
**Dr. Jitendra Singh Chahar**  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
**Dr. P. Sanjeev**  
 Assoc Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

  
**डॉ० अनिल कुमार वर्मा**  
 अध्यक्ष  
 एनेस्थीसियोलॉजी, ट्रिपल कैंसर  
 एवं पैन मेडिसिन  
 जी.एस.वी.एम. मेडिकल कॉलेज  
 कानपुर

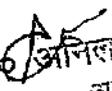
  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

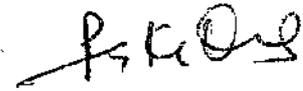
### Optional Modules and Accessories Prices

- |  |                  |
|--|------------------|
| 1. The number of transport module needs to be specified for the total number of parent monitor requirement. Cost of each transport module is | --- Rs. 5 Lacs   |
| 2. Spirometry  | ----Rs.3 Lacs    |
| 3. Minimal Invasive cardiac output   | ---Rs.2 Lacs     |
| 4. EEG   | ----Rs. 3.5 Lacs |
| 5. AGM   | ----Rs.5 Lacs    |
| 6. BIS   | ----Rs.3 Lacs    |
| 7. Mainstream/sidestream ETCO2   | ----Rs.2 Lacs    |
| 8. Central Station(16 bed)   | ---Rs. 7 Lacs    |

  
 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 Dr. O.P. Sanjeev  
 Assoc Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

  
 डा० अनिल कुमार वर्मा  
 आचार्य  
 एनेस्थीसियोलॉजी, क्रिटिकल केयर  
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 जी एस.पी.एम. मेडिकल कॉलेज  
 काजपुर

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## High End monitor

(Intended to be used in ICUs)

1. High-end modular monitor should have Adult, Pediatric and Neonatal applications with facility of freely exchangeable high end parameter modules like EtCO<sub>2</sub>, NMT, BIS/ Entropy, AGM as per requirement
2. Should be user friendly with full touch screen operation.
3. The monitor should have 15 inch color TFT/LCD display, screen resolution at least 1280 x 1024 pixels
4. It should be capable of monitoring ECG, Two invasive blood pressure, non-invasive blood pressure, oxygen saturation (SpO<sub>2</sub>), perfusion index, dual temperature, as standard.
5. The monitor should have display of 12 or more waveform simultaneously. Auto snapshot facility(alarm triggered) should be available to capture the critical events automatically
6. The color of each individual curve should be freely selectable.
7. Main monitor must be supplied with power backup 2 hours
8. The monitor should have facility for enlarge numeric display for distance viewing with multiple layout of screen.
9. Monitors should have facility to store and display last 48 hours or more full disclosure of waveforms directly
10. Should have a facility to deactivate all the alarms if necessary.
11. Should have event recall minimum up to 24 hours Trend, graphical and tabular trends, alarm logs and able to take print out using network printer.
12. Monitor should be capable for Bed-to-Bed View connectivity thru
13. It should have facility to display real time data and alarms of other bedside monitors.

### ECG monitoring essential specification:

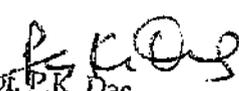
1. Available leads: I, II, III, V, AVR, AVF with facility for recording 5 lead ECG.
2. Should display at least four or more selected leads at a time.
3. Monitor should have Simultaneous four-lead analysis
4. Accuracy of  $\pm 2$  beat/min.
5. Should efficiently filter out the ESU disturbances and defibrillation protection.
6. Should have ST segment analysis.
7. Should have arrhythmia monitoring facility for up to 20 arrhythmias types. It should store and display the number of arrhythmias occurred in last 48 hours with ECG segment.
8. Should have user selectable alarms.
9. Heart rate measured ranges 20-300 or more beats/min.
10. Display sweep speeds 6.25, 12.5 and 25 mm/sec, measured by the same ECG lead

### Pulse Oximeter (SpO<sub>2</sub>) :

1. Should provide a digital value of the arterial oxygen saturation as well as diagnostic plethysmograph pulse waveform, perfusion index display.
2. Measurement range 0% to 100% +/-2% (80-100%) accuracy.
3. User selectable upper and lower alarm limits.
4. Should have Massimo/Nellcor/Equivalent technology to work well in low perfusion and motion Artifacts.
5. Should provide the clinical data/reports in support for the accuracy of SPO<sub>2</sub> in low Perfusion.

Dr.  Anand Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow  
Asstt. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

Dr.  Anil Kumar Sharma  
आचार्य  
जि.एस.पी.एम. मेडिकल कॉलेज  
कानपुर

Dr.  P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**Respiration :**

1. Range 0-150 breaths/min
2. Accuracy :  $\pm 2$  breaths/min
3. Should have an apnea alarm.

**Invasive pressure monitoring:**

1. Should have the ability to measure and display minimum two or more invasive pressure value with waveforms.
2. Should have facility to measure and display pulse pressure variation from arterial pressure waveform.
3. User selectable upper and lower alarm limits.
4. Measuring range: 0 to 300 mm Hg.
5. Accuracy :  $\pm 1$  mmHg

**Non-Invasive blood pressure (NIBP) monitoring:**

1. Range: 0-280 mm Hg for adults and 0-200 pediatric.
2. Manual, auto and time limited with user selectable automatic time intervals, stats mode.
3. Accuracy:  $\pm 3$  mm Hg

**Network integration**

1. Monitor should be HL7 compliant and able to connect to hospital information system
2. Monitor should be IT enabled for single point access to web based applications/digital connectivity solution (like X-ray, DICOM, HIS. Should give direct access to Web-based applications/ digital connectivity solution

**The monitoring should be Upgradable to**

1. Cardiac output monitoring module
2. ETCO<sub>2</sub>
3. NMT
4. BIS/ Entropy

**Certificates**

1. The unit should be US FDA.
2. IEC-6060-1
3. The quoted model should be CDSCO approved for Manufacturer or Importer

Dr. O. P. Sanjeev  
Assoc Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

डा. अमित कुमार वर्मा  
जानाब  
एनेस्थीसियोलॉजी, क्रिटिकल केयर  
एवं रेन मेडिसिन  
जी.एस.टी.एम. मेडिकल कालेज  
कानपुर

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

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Dr. RMLIMS, Lucknow

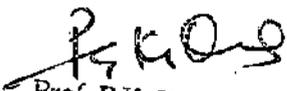
**Scope of Supply with each monitor**

- a. ECG Cable & ECG 5 Leads wire for adult - 1 set
- b. SpO2 Sensor Adult - 1 No
- c. SpO2 Sensor Pediatric - 1 No
- d. NIBP Hose- 1 No
- e. NIBP cuff Adult - 1 box
- f. NIBP cuff Pediatric - 1 box
- g. Dual Temp rectal and skin Probe- 1 each
- h. Dual IBP interface Cable with 10 transducer set- 1 No
- i. Wall Mount - 1 set

  
 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 Dr. O.P. Sajeer  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

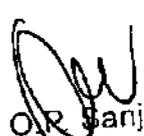
  
 डा. अनिल कुमार वर्मा  
 प्राध्यापक  
 एनेस्थीसियोलॉजी, क्लिनिकल कैम्पर  
 एवं पैन मेडिसिन  
 ली.एस.पी.एच. मेडिकल कॉलेज  
 काशीपुर

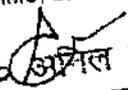
  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

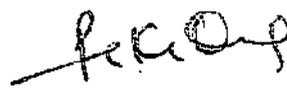
**Optional Modules and Accessories Prices**

1. Mainstream/ Sidestream ETCO2 ----Rs.2 Lacs
2. Central Station(16 bed) ---Rs. 7 Lacs
3. AGM ---- Rs. 4 Lacs
4. BIS/Entropy ---- Rs. 3.5 Lacs
5. NMT ---- Rs. 4.5 Lacs

  
 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 Dr. O.P. Sanjeev  
 Assor. Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

  
 डा. अनिल कुमार वर्मा  
 आचार्य  
 एनेस्थीसियोलॉजी, क्रिटिकल केयर  
 एवं पैन मेडिसिन  
 श्री राम लाल अस्प. मे. प्र. क. लखनौ

  
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 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## FOWLER BED ELECTRIC

1. Overall Size: Approx. 2200 mm x 990 mm (L x W) ( $\pm 10$  mm Engineering Variation)
2. Bed frame: Approx. 2000 mm x 860 mm (L x W) ( $\pm 10$  mm Engineering Variation)
3. Minimum Height (without mattress) : 350 mm  $\pm$  10 mm (without mattress)
4. Maximum Height (without mattress) : 700 mm  $\pm$  10 mm (without mattress)
5. Backrest adjustment up to  $70^\circ \pm 5^\circ$
6. Knee rest adjustment up to  $25^\circ \pm 5^\circ$
7. Four section 1.2 mm (18 G) CRCA M.S perforated sheet top for easy breathing of mattress.
8. Fixed mattress arresters on both sides of Head & Leg sections.
9. Backrest, knee rest, height adjustment, cardiac chair positions operated by Electromechanical adjustment through-Hand remote.
10. Manual pull lever on both sides of the bed to quickly bring the backrest to a flat position for CPR. Manual CPR assisted with the counterbalance spring mechanism which allows the backrest to come to a flat position without any jerk.
11. The bed frame is made from 50 mm x 30 mm x 1.8 mm thick and 40 mm x 20 mm x 2.3 ERW tube with proper support and Flat of size 12 mm x 10 mm, 40 mm x 10 mm, 25 mm x 10 mm and 32 mm 6 mm.
12. The base frame is having expanded tube size of 31.75 mm x 2.0 mm (14 G) for mounting 125 mm, Dia. Single Wheel Castors of High-grade synthetic Body with Individual locking system.
13. Degree indicator on both sides for Backrest positions. It is mounted in a foot side railing.
14. The bed has ABS/HDPE moulded head & foot panels detachable by hand without the need for any tool. Four corner rubber buffers of 100MM dia.
15. The mattress base should be removable ABS/HDPE for easy cleaning.
16. The bed has ABS/HDPE moulded Safety side railings on both sides. Railings are fitted to the mattress support sections and raised and locked through a spring lock mechanism.
17. Four locations on the bed to hold one stainless steel Saline rod 12 mm dia with 31.7 mm dia x 1.2 mm (18 G) stainless steel SS 304 Grade outer covering tube with a knob to mount the syringe pump. This saline pole is mounted on a round bracket size 40 mm OD x 32 mm ID made from MS tube and welded with the bed frame.
18. Four/ Single section Mattress with 100 mm thickness PU foam of 32 Density covered with PVC Safe Working Load-230 kg.
19. Battery Backup: 10 to 12 complete cycles of full functions.
20. The lowest bed height should be 35cm (without a mattress).
21. Side-rails are provided with stopper levers than can lock them when in use. The lock is constructed so that side rails cannot be unlocked when a load is applied in the downward direction of the side rail or the outward direction of the bed-FOR PATIENT SAFETY.
22. Back section operation should have Stretch Saver Raise (SSR) mechanism to prevent any pressure build-up on the Patient's abdomen.
23. Warranty of 05 years will apply for mattress as well.
24. Satisfactory quality of all the movements.

डा० अमिता कुमार वर्मा  
 अध्यक्ष  
 एनेस्थीसियोलॉजी, क्लिनिकल कैथर  
 एवं पैन मेनेज्मन्ट  
 जी.एस.के.एम. मेडिकल कॉलेज  
 कानपुर

Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

Dr. O.P. Sanjeev  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 S.G.P.G.I.M.S., Lucknow

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

25. Satisfactory quality of joints welding.
26. Satisfactory quality of painting.
27. Satisfactory quality of mattress and its cover.

**Electrical Specifications:**

1. Nominal- 220-240 VAC, 50 Hz
2. Switch Mode Power Supply: Operating range with battery (85 V to 265 V) and Operating range without battery (85 V to 265 V), frequency 50/60 Hz and Max ampere 5 A.
3. Degree of Shock Protection: Type B
4. Power Consumption ideal mode with battery: 24 V

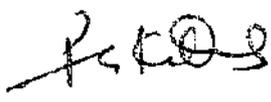
**Certifications:**

1. Protection Voltage: 100 to 240 V
2. Power Consumption at maximum load: 500 VA or less
3. Liquid Ingress Protection: IPX4
4. Rechargeable Batteries: 2 X 12 Volt Sealed Lead/ Acid Gel.
5. All Process Parameters to be as per documented IMS Procedures for Quality Assurance (ISO 9001: 2015/ISO 14001: 2015/ISO 45001: 2018/ ISO 13485:2016) Quality Management Systems) & EU CE/BIS from notified body.

  
Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

  
Dr. O.P. Sanyal  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

  
डा. अनिल कुमार वर्मा  
अध्यक्ष  
एनेस्थीसियोलॉजी, सिविलियन मेडिसिन  
एवं पैल मेडिसिन  
जी.एस.पी.एम. मेडिकल कॉलेज  
लखनऊ

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Basic ICU Bed

### Technical Specifications for ICU Bed

1. The bed should have four motors with the function of back raise, knee raise, Hi-lo, Trendelenburg, and reverse Trendelenburg, One button cardiac chair, one button CPR.
2. Each operation is activated using electric actuators.
3. Manual CPR (Quick release) & Eclectic CPR function should be provided.
4. The back raise function should have retraction and extension motion to reduce pressure and shearing on the patient.
5. Low bed height should be 320-370 mm (without mattress) with an indicator to see from a distance that the bed is at the lowest height.

### Measurement/Dimension

1. Back Raise; 0-70 degrees.
2. Knee Raise: 0-25 degrees.
3. Trendelenburg/Reverse Trendelenburg :  $0 \pm 12$  degrees.
4. Mattress base height: 320 -760 mm – Low bed height to minimize injury in case of patient fall.
5. Overall size: 990 -1000mm (w) x 2,200-2300mm (L)+/-10mm
6. Safe working load: 230 kg.

### Side rails

1. Split side rails with foot side open, foldaway movement with embedded control panel for patient & Caregiver. Side rails can bear a weight of 50 kg or more than that to provide better stability.
2. Side rails are to be swing away type and can be lowered so that side rails would not be in a way while caregiving or transferring a patient.
3. Side- rails are provided with stopper levers that can lock them when in use. The lock is constructed so that side rails cannot be unlocked when a load is applied in the downward direction of the side rail or the outward direction of the bed. – For Patient safety.
4. The bed comes equipped with a buffering mechanism to soften shocks and impacts that occur when side rails are lowered.
5. The outside of both side-rails at the head end comes with a recessed side-rail with a Bi – lateral integrated Control panel.
6. The inside of both side rails at the head end comes with a recessed control panel for the patient.
7. Both side – rails at the head end have a grip position and a shape so that patients can easily hold on to them when standing up after back raising.
8. There are angle indicators on the outside of both side rails at the head end to indicate the back raise angle.

Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

Dr. P. Sanjeev  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGGIMS, Lucknow

डा. प्र. क. दास  
 प्रा. प्र. क. दास  
 एनेस्थीसियोलॉजी, क्लिनिकल चैम्बर  
 एच. के. एम. मेडिकल कॉलेज  
 डॉ. एम. डी. एम. मेडिकल कॉलेज  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

9. There are angle indicators on the outside of both side rails at the foot end to indicate Trendelenburg angle.
10. To ensure the safety of the patient, the voltage for the Side- rail integrated panel and patient control panel should be 5 V.
11. The side - rail integrated panel should have a switch to enable or disable the patient control panel to prevent operation errors.
12. The side - rail integrated panel should be with a battery allowing the bed to be operated in case of power failure or lack of power supply.

#### Mattress base

1. The mattress base structure is divided into four areas, the back, hip, knee, and foot, and the main material is HDPE plastic which should be removable for cleaning & housekeeping purposes.
2. There should be ventilation holes inserted into each surface of the HDPE base that is designed to allow proper ventilation to flow through the base.
3. The mattress base is provided with a mattress stopper to prevent the mattress from shifting out of place or sliding downward.
4. Good quality powder coating to be used for surface finishing on the main parts to prevent rusting of structural materials and maintain surface strength.
5. Each section base allows a urine bag to be hooked on.
6. Two accessory rails (one on each side) are provided on both side surfaces of the main frame.
7. Corner bumpers are attached to the four corners of the bed to prevent scratches to the bed, walls, and other objects.
8. Four IV pole attachment holes are provided, two on the head end and two on the foot end.

#### Castors

1. Total locking system, single - wheel casters with a wheel diameter of 125mm should be used for casters. The caster operating step allows the user to switch between simultaneously locking and unlocking all four casters (swivelling and rotation), and steering (one wheel on head end only).
2. The caster wheels should be made of polyurethane resin with excellent abrasion resistance, ageing resistance, and oil resistance.
3. To improve transferability, one of the four casters should be a steering caster.

#### Head & Footboard

1. The headboard and footboard are made of chemical - resistant resin material and come with grips at the top that enable easy handling during transfer.
2. The headboard and footboard can be attached and detached easily and are provided with stoppers to prevent them from becoming detached at inopportune times.
3. In regards to hygienic management, the boards are to be with less unevenness, a flat shape to let wiping be easier

Dr. Jitendra Singh Chahar

Assistant Professor

Department of Critical Care Medicine

SGPGIMS, Lucknow

डॉ. अनिल कुमार  
अनाम  
एनेस्थीसियोलॉजी, क्रिटिकल केयर  
एंड पैन मेडिसिन  
जी.एस.जी.एस. अस्पताल, काशीपुर

Dr. Anirban Jana  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

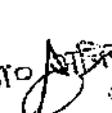
**Certifications:**

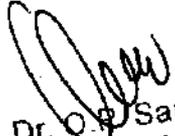
1. Instruments must be ISO certified and a copy should be enclosed. (The ISO Certificate must be issued by any organization accredited by the Bureau of Indian Standard or accredited by the international accrediting forum "IAF" (Certificate to be attached).
2. Electrical safety conforms to standards for electrical safety IEC-60601-1 General Requirements and IEC-60601-2-25 safety of Electrocardiograms. (Or Equivalent BIS Standard)
3. Should have USFDA/ EU CE certificate from notified body.

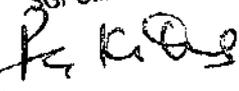
**Scope of supply:**

1. Bed to be supplied with suitable size mattress. Having durable long- lasting, elastic, and non-skid mattress cover having antibacterial and anti-fungal properties (MRSA anti-bacterial cover)
2. Bed to be supplied with one IV Poles
3. Power cable fitted with Indian plug (input to be 220-240VAC, 50Hz as appropriate).

  
 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 डा० अनिल कुमार वर्मा  
 आचार्य  
 एनेस्थीसियोलॉजी, क्रिटिकल केयर  
 एवं एम. मेडिसिन  
 जी.एस.जी.एम. अंतर्गत फार्मास्य  
 लखनऊ

  
 Dr. O.P. Sanjeev  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

### Advanced ICU Bed

1. ICU Bed (7 function) with electrically operated back rest tilting 0-70°, knee rest tilting 0-30°, trendelenburg tilting 0-12°, Reverse trendelenburg tilting 0-12°, mattress base (lateral) tilting to the left up to 12°, tilting to the right up to 12°
2. All the Electrical Adjustments of the bed should be done by 6 actuators.
3. Outer dimensions L2240\*W1060mm ( $\pm 10$ mm), Bed extension 200mm ( $\pm 10$ mm), height Adjustment 440mm to 750mm (+-5%). All function controlled with Electric Actuator.
4. Split Guard rails: Guard rail PP- 4pcs provides protection to patient.
5. Angle Gauge on Side rails display's the angle of back rest, Lateral tilt and Trendelenburg / Reverse Trendelenburg.
6. Integrated Scale control panel: Weighing Function should be displayed on the touch screen which should be embedded in foot end Panel (Integrated with Control Box).
7. The Bed should have Safety feature, the lateral tilt position shall only function when all the guard rails and locked and in up right Position.
8. Removable mattress platform: PP Plastic board mattress platform can be easily removed for sterilization.
9. Mounted on 150mm noiseless castor with central locking.
10. Embedded controls on both sides of guard rails, Linen shelf: At the bottom of foot end
11. Easily Removable head and Foot Board Panels
12. X-ray cassette holder provided in Backrest.
13. Manual/Electric CPR: The Electric CPR operates with one key control & Manual CPR can be used single handedly.
14. The bed should be provided with Mattress of 40 Density with Washable, anti-Microbial rexine cover.
15. Safe working load of 200 kg or more. SWL means bed operate while 170 kg weight on bed and all movement should be functional.
16. Bed has mattress stopper for improving safety and better mattress positioning.
17. Bed have corner buffers for protection.
18. Satisfactory quality of all the movements.
19. Satisfactory quality of joints weilding.
20. Satisfactory quality of painting.
21. Satisfactory quality of mattress and its cover.

#### Certifications:

1. Electrical safety Standard Power in AC, 50/60 HZ, Electric Shock Protection; Class 1, At least mattress washable.
2. Manufacturer should have ISO 9001:2015 & ISO 13485:2016 from NABCB Accredited Certification Body. Copy to be provided along with bid.

डा. अनिल कुमार वर्मा  
अध्यक्ष  
एनेस्थीसियोलॉजी, क्लिनिकल केंद्र  
एन के मेडिकल  
की एस सी एन - मेडिकल कॉलेज  
लखनऊ

Dr. Jitendra Singh Chahal  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

Dr. P. Sanjeev  
Assoc Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

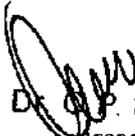
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

3. Manufacturer should also have ISO 50001:2018, Green Guard, BIFMA, ISO 14001:2015, ISO 45001:2018. Copy to be provided along with bid.
4. Manufacturer must have CDSCO License / Registration.
5. Manufacturer must have USFDA and EU CE.

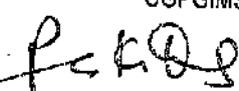
**Scope of supply:**

1. Bed to be supplied with suitable size mattress. Having durable long- lasting, elastic, and non-skid mattress cover having antibacterial and anti-fungal properties (MRSA anti-bacterial cover)
2. Bed to be supplied with one IV Poles
3. Power cable fitted with Indian plug (input to be 220-240VAC, 50Hz as appropriate).

  
 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 Dr. P. Sanjeev  
 Assoc Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

  
 डॉ० अमित कुमार वर्मा  
 अध्यक्ष  
 एनेस्थीसियोलॉजी, इंटेंसिव केयर  
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 जी.एस.जी.एम. मेडिकल कॉलेज  
 कानपुर

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**Ventilator (Transport/ Portable)**  
(Intendant use: Intra Hospital/ Inter Hospital Transportation)

1. The ventilator should be Microprocessor based Independent of Medical Air.
2. The unit should have light weight (less than 7kg) for easy transport purpose and different Mounting options capable of ventilating and transport different environments such as emergency ICU, Road-Ambulance.
3. The machine should have integrated turbine/blower able to generate a peak flow of 240 or more.
4. Ventilator must be capable to ventilate Adult, Paediatric and Neonates patients.
5. Machine should have facility to ventilate Both Invasive & Non-invasive with leak compensation.
6. Should be based on flow measuring technology.
7. Ventilator should have upgradable option to mainstream EtCO<sub>2</sub> and Spo<sub>2</sub>.
8. The ventilator should have standard facilities of LPO-Low pressure oxygen for intra hospital transportation.
9. Should have O<sub>2</sub> sensors and It should be covered under warranty.
10. Ventilator should have min 8" inch TFT colour touch screen with a rotatory encoder knob.
11. The ventilator should have following Modes of ventilation:
  - a) CMV, PCV, SIMV, PSIMV.
  - b) Dual control modes like PRVC/APV/Auto flow etc.
  - c) PSV/CPAP.
  - d) Non Invasive Mode for PC and PS.
  - e) Should have CPR mode of ventilation. Should have CPR mode without disconnecting patient we can continue the CPR no need to Ambu the patient.
  - f) Should have Volume Support Ventilation.
12. Ventilator should have inbuilt nebulizer.
13. The ventilator should have the following Setting Parameter
  - a) Tidal Volume: 20-2000ml
  - b) BR: 1-80b/min
  - c) I:E Ratio: 1:9 to 4:1
  - d) PInsp: 5-60cmH<sub>2</sub>O
  - e) PEEP/CPAP (cmH<sub>2</sub>O) 0 to 35
  - f) Trigger, flow (l/min) 0.5 to 20.0
  - g) P Support (cmH<sub>2</sub>O) 0 to 60
14. The machine should have battery backup min 6 hrs.
15. Should display vital monitoring parameters including Exhaled tidal volume, Breath rate, I:E ratio, FiO<sub>2</sub>, Peak Pressure, Mean Airway Pressure etc.
16. The machine should have 360° visual alarm with audible High, Medium, Low Priority Alarm facility.

डा० अरवि कुमार वर्मा  
ज्येष्ठ  
एनेस्थीसियोलॉजी, इन्डिपेंडेंट क्लिनिक  
एवं मेन मेडिसिन  
जी.एस.जी.एम. मेडिकल कॉलेज  
लखनऊ

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

Dr. P. Sanjeev  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

17. The machine should have graphical display of Pressure, Volume, Flow as standard and (EtCo2 and SpO2) as optional.
18. Should have Visual representation of ventilator dependency, grouped into oxygenation, CO2 elimination, and patient activity.
19. Source input pressure of oxygen: 41 to 60 psi (HPO) and LPO both.
20. Should have graphical trends for maximum of 72 hours.
21. Should have display facility of Loops: Pressure/Volume, Pressure/Flow, Volume/Flow.
22. Should have Interface connectors USB as standard and upgrading facility to RS-232 and PDMS.
23. **Certification:**
  - a) EN 60601-1:2006/A1:2013, IEC 60601-1-2:2014
  - b) transport standards EN 794-3 and ISO 10651-3 for emergency and transport ventilators, EN 1789 for ambulances
  - c) USFDA and EU CE from notified body.
24. **Scope of supply:**
  - a. Flow sensors with each ventilator – 10 nos.
  - b. Test lung Adult/pediatric – 1 no
  - c. Oxygen hose – 1no
  - d. Power cable – 1 no.

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

Dr. O. Anjeev  
Asst. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

डा० अनिल कुमार वर्मा  
एनेस्थीसियोलॉजी, सिटीजनल कैयर  
इव फोन रेजिडेंट  
जी.एस.पी.एम. मेडिकल कॉलेज  
कानपुर

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Basic Ventilator

(Intended to be used in HDU/Post-operative ward/Non ICU area)

S. No.	Technical Specifications
1.	Should be a microprocessor-controlled ventilator with providing support to Adult/pediatric and upgradable to neonatal range.
2.	Ventilator should have IBW automatic setting.
3.	Ventilator should be either inbuilt turbine or external medical grade compressor based
4.	High flow oxygen therapy with at least 60 LPM direct adjustable flow should be available as standard along with one set of cannula for adult/Ped Patients
5.	Inbuilt display should Be 12 inch or higher
6.	Ventilator should have the capability to upgrade to ETCO <sub>2</sub> measurement in the future
	<b>Should have following mode of ventilation</b>
7.	Volume control -VC/PC in CMV
8.	Assist control VC/PC
9.	CPAP with pressure support, along with APRV
10.	SIMV (Volume Control/ Pressure Control with Pressure support)
11.	BIPAP/BIVENT/BI-LEVEL or equivalent with the settings of ventilatory breaths
12.	Combination/Dual modes such as PRVC/Auto flow/PAV/APV for automatic adjustment of pressure.
13.	Apnoea backup ventilation mode with adjustable settings option
14.	Separate independent NIV: Mode with automatic leakage compensation
15.	There should be leak adapted trigger, compensating for the leakages during NIV.
	<b>Should have the following parameters</b>
16.	"Tidal Volume in Volume mode: 20- 2000ml
17.	CPAP/PEEP /Intermittent peep :1 - 35 cmH <sub>2</sub> O
18.	Pressure support - 0-60 cmH <sub>2</sub> O
19.	Pressure control 5 to 60 cmH <sub>2</sub> O
20.	Pressure ramp 0 to 2000ms.
21.	Respiratory rate: 1-80bpm
22.	Inspiratory Time - 0.1-10sec
23.	I:E ratio 1:5 to 4:1
24.	Trigger sensitivity: - Flow 0.5 to 20 l/min, Pressure Trigger: -0.1 to -15 cm H <sub>2</sub> O.
25.	Expiratory trigger sensitivity (cycle) 5 to 80% of inspiratory peak flow.
26.	Occlusion pressure should be available P0.1

डा० अशोक कुमार वर्मा  
 अध्यक्ष  
 एनेस्थीसियोलॉजी, इंटिग्रेज्ड सेंटर  
 एन पीय मेडिकल  
 जी.एस.जी.एस. मेडिकल कॉलेज  
 लखनऊ

Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

Dr. G.P. Saha  
 Asso. Professor  
 Dept. of Emergency Medicine  
 SGP GIMS, Lucknow

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

27.	FIO2 21-100%
28.	Should have facility for a) Manual Breath b) standby c) screen-lock d) Inspiratory hold e) Expiratory Hold f) Suctioning tool g) Configurable Quick Start-Settings
29.	should have a display of weaning parameters like RSBI, expiratory time constant (RC Exp), PNIF, WOBI, Elastance & Pressure Time Product. (Pressure generated by respiratory muscles during inspiration).
30.	It should display breath to breath measured values of tidal volume; minute volume, spontaneous frequency, FIO2, Peak, Pmean, PEEP, Pplateau, Resistance, compliances
31.	Should have following Alarms: a) Low/high minute volume b) Low/high Pressure c) Low/high tidal volume d) low/ high Rate e) Apnea time f) low/high oxygen g) Loss of PEEP h) Patient Disconnection i) Exhalation obstruction j) Power supply k) Batteries l) Gas supply failure
32.	should have inbuilt battery back-up for at least 90 minutes for ventilator in the event of Power failure.
33.	It should have simultaneous display of a minimum 2 wave forms along with 2 loops and dynamic lung. The screen should display the following waveforms: a) Flow Vs time b) Pressure Vs time c) Volume Vs time d) ASV/AVM Minute ventilation Graph and following loops e) Pressure-volume f) Flow-volume g) Flow-pressure
34.	Ventilator should have inbuilt FIO2 Monitoring
35.	Should have auto reusable expiration cassette/valves for complete disinfection capability.
36.	Should be supplied with vibrating mesh Nebulizer
37.	Should have Interface connecting facility to patient data management system.

डा० जयशंकर कुमार वर्मा  
अध्यक्ष  
एनेस्थीसियोलॉजी, इन्सिटीयूट ऑफ मेडिसिन  
जी.एस.जी.एम. लखनऊ

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.R.G.I.M.S., Lucknow  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Dr. O.P. Sameev  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

38.	<b>Up-gradation features:</b> a) Neonatal mode
39.	<b>Certification</b> a) The ventilator should be US FDA/EU CE from Notified body. b) ISO13485 certificate issued by organization accredited by IAF (International Accreditation Forum) c) The quoted model should be CDSCO approved for Manufacturer or Importer
40.	<b>Scope of supply should include the following with each ventilator</b> a) corrosion free ventilator cart /trolley with circuit holding arm from the same source b) Breathing circuit disposable with HMEF for adult & ped 10 pcs each c) Oxygen connecting hose and air connecting hose (if needed ) 1 pc each d) Vibrating mesh Nebulizer e) Test lung and instruction manual

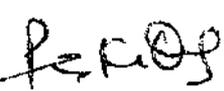
**NOTE:**

1. Those colleges /institute who don't have compressed air supply at places where ventilator is intended to be used should include compressor as scope of supply: 1.5 Lacs
2. Servo Controlled Humidifier: 1 Lac
3. Neonates mode up-gradation: 1.5 Lacs

  
Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

  
Dr. O.P. Sanjeev  
Assoc Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

डा० जितेंद्र कुमार चहार्  
आचार्य  
एनेस्थीसियोलॉजी, इन्टेंसिव क्येअर  
एवं ईमर्जेंसी मेडिसिन  
जी.एस.जी.एम. मेडिकल कॉलेज  
कानपुर

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## High End ICU Ventilator

(Intended to be used in ICUs)

S. No.	Technical Specifications
1.	Should be a microprocessor-controlled ventilator with providing support to Adult/pediatric and upgradable to pre-term & neonatal range.
2.	Ventilator should have IBW automatic setting.
3.	Preferable to have a dynamic lung view for an adult-paed patient to visualize assessment for compliance, resistance, obstructive and spontaneous breathing indication
4.	Ventilator should be either inbuilt turbine or external medical grade compressor of same make.
5.	High flow oxygen therapy with at least 60 LPM direct adjustable flow should be available as standard along with one set of cannula for adult/Ped Patients
6.	Inbuilt display should Be 12 inch or higher touch with rotary knob operation
7.	Ventilator should have the capability to upgrade to SPO2 and ETCO2 measurement in the future
	<b>Should have following mode of ventilation</b>
8.	Volume control -VC/PC in CMV
9.	Assist control VC/PC
10.	CPAP with pressure support, along with APRV
11.	SIMV (Volume Control/ Pressure Control with Pressure support)
12.	BIPAP/BIVENT/BI-LEVEL or equivalent with the settings of ventilatory breaths
13.	Combination/Dual modes such as PRVC/Auto flow/PAV/APV for automatic adjustment of pressure.
14.	Should be capable to upgrade to Automatic Adjustment of Oxygenation and Ventilation covering all applications (Different Lung Mechanics) from intubation through extubation With Lung Protective Ventilation like Hypo Ventilation, Hyper Ventilation, High/Low Tidal Volume, Minimum Alveolar Ventilation, Dead Space Ventilation Etc
15.	Apnoea backup ventilation mode with adjustable settings option
16.	Separate independent NIV: Mode with automatic leakage compensation
17.	There should be leak adapted trigger, compensating for the leakages during NIV.
	<b>Should have the following parameters</b>
18.	Tidal Volume in Volume mode: 20- 2000ml
19.	CPAP/PEEP /Intermittent peep :1 - 35 cmH2O
20.	Pressure support - 0-60 cmH2O
21.	Pressure control 5 to 60 cmH2O

डा० अशोक कुमार वर्मा  
 अध्यक्ष  
 एनेस्थीसियोलॉजी, आइकएचके  
 एवं वेंदु मेडिकल  
 जी एस.पी.एम. मेडिकल कॉलेज  
 कन्नपुर

Dr. Jitendra Singh Chahar,  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

Dr. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

Dr. P. Sanjeev  
 Asst. Professor  
 Dept. of Emergency Medicine  
 SGGIMS, Lucknow

22.	Pressure ramp 0 to 2000ms.
23.	Respiratory rate: 1-80bpm
24.	Inspiratory Time - 0.1-10sec
25.	I:E ratio 1:5 to 4:1
26.	Trigger sensitivity: - Flow 0.5 to 20 l/min, Pressure Trigger: -0.1 to -15 cm H <sub>2</sub> O.
27.	Expiratory trigger sensitivity (cycle) 5 to 80% of inspiratory peak flow.
28.	Occlusion pressure should be available P <sub>O<sub>2</sub></sub>
29.	FI <sub>O<sub>2</sub></sub> 21-100%
30.	Should have facility for a) Manual Breath b) standby c) screen-lock d) Inspiratory hold e) Expiratory Hold f) Suctioning tool g) Configurable Quick Start-Settings
31.	Should be able to measure intrinsic PEEP
32.	should have a display of weaning parameters like RSBI, expiratory time constant (RC Exp), PNIF, WOBI, Elastance & Pressure Time Product. (Pressure generated by respiratory muscles during inspiration).
33.	It should display breath to breath measured values of tidal volume; minute volume, spontaneous frequency, FIO <sub>2</sub> , Peak, P <sub>mean</sub> , PEEP, P <sub>plateau</sub> , Resistance, compliances
34.	Ventilator should have the facility of P-V tool to find the recruitability of the ARDS Lung along with the facility to calculate the LIP and UIP.
35.	Should have following Alarms: a) Low/high minute volume b) Low/high Pressure c) Low/high tidal volume d) low/ high Rate e) Apnea time f) low/high oxygen g) Loss of PEEP h) Patient Disconnection i) Exhalation obstruction j) Power supply k) Batteries l) Gas supply failure
36.	should have inbuilt battery back-up for at least 90 minutes for ventilator in the event of Power failure
37.	It should have simultaneous display of a minimum 2 wave forms along with 2 loops and dynamic lung. The screen should display the following waveforms: a) Flow Vs time

डा. अनिल कुमार वर्मा  
आचार्य  
एनेस्थीसियोलॉजी, सिकिअर वेंचर  
एन वैन मेडिसिन  
जी.एस.पी.एम. मेडिकल कॉलेज  
फाजपुर

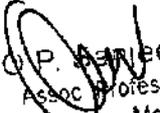
Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow  
Dr. O.H. Saha  
Assoc. Professor  
Dept. of Emergency Medicine  
S.G.P.G.I.M.S., Lucknow  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

	b) Pressure Vs time c) Volume Vs time d) ASV/AVM Minute ventilation Graph and following loops e) Pressure-volume f) Flow-volume g) Flow-pressure
38.	Ventilator should have inbuilt FIO <sub>2</sub> Monitoring
39.	Should have auto reusable expiration cassette/valves for complete disinfection capability.
40.	Should be supplied with vibrating mesh Nebulizer
41.	Should have Interface connecting facility to patient data management system.
42.	<b>Up-gradation features:</b> a) Automatic Adjustment of Oxygenation and Ventilation covering all applications b) Neonatal mode
43.	<b>Certification</b> a) The ventilator should be US FDA and EU CE from Notified body. b) ISO13485 certificate issued by organization accredited by IAF (International Accreditation Forum) c) The quoted model should be CDSCO approved for Manufacturer or Importer
44.	<b>Scope of supply should include the following with each ventilator</b> a) corrosion free ventilator cart /trolley with circuit holding arm from the same source b) Breathing circuit disposable with HMEF for adult & ped 10 pcs each c) Oxygen connecting hose and air connecting hose (if needed ) 1 pc each d) Vibrating mesh Nebulizer e) Test lung and instructions manual

**NOTE:**

1. Those colleges /institute who don't have compressed air supply at places where ventilator is intended to be used should include compressor as scope of supply: 1.5 Lacs
2. Servo Controlled Humidifier: 1 Lac
3. Neonates mode up-gradation: 1.5 Lacs
4. Automatic Adjustment of Oxygenation and Ventilation covering all application: 7.5 Lacs

  
 Dr. Jitendra Singh Chahar,  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 Dr. O.P. Banerjee,  
 Assoc Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 डा० अनिल कुमार वर्मा  
 जलपाय  
 एनेस्थीसियोलॉजी, सिविलजल वैद्यक  
 एवं पैरा मेडिसिन  
 जी.एस.बी.एम. मेडिकल कॉलेज  
 कानपुर

## Advanced ICU Ventilator

(Intended to be used in high end ICUs of tertiary care centres)

S. No.	Technical Specifications
1.	Should be a microprocessor-controlled ventilator with providing support to Adult/pediatric and upgradable to pre-term & neonatal range.
2.	Ventilator should have IBW automatic setting.
3.	Should have a dynamic lung view for an adult-paed patient to visualize assessment for compliance, resistance, obstructive and spontaneous breathing indication
4.	Ventilator should be either inbuilt turbine or external medical grade compressor based
5.	High flow oxygen therapy with at least 60 LPM direct adjustable flow should be available as standard along with one set of cannula for adult/Ped Patients
6.	Inbuilt display should Be 15 inch or higher touch with rotary knob operation
7.	Ventilator should have ETCO <sub>2</sub> measurement.
8.	<b>Should have following mode of ventilation</b>
9.	Volume control -VC/PC in CMV
10.	Assist control VC/PC
11.	CPAP with pressure support, along with APRV
12.	SIMV (Volume Control/ Pressure Control with Pressure support)
13.	BIPAP/BIVENT/BI-LEVEL or equivalent with the settings of ventilatory breaths
14.	Combination/Dual modes such as PRVC/Auto flow/PAV/APV for automatic adjustment of pressure.
15.	Should be capable to upgrade Automatic Adjustment of Oxygenation and Ventilation covering all applications (Different Lung Mechanics) from intubation through extubation With Lung Protective Ventilation like Hypo Ventilation, Hyper Ventilation, High/Low Tidal Volume, Minimum Alveolar Ventilation, Dead Space Ventilation Etc
16.	Apnoea backup ventilation mode with adjustable settings option
17.	Separate independent NIV: Mode with automatic leakage compensation
18.	There should be leak adapted trigger, compensating for the leakages during NIV.
	<b>Should have the following parameters</b>
19.	"Tidal Volume in Volume mode: 20- 2000ml
20.	CPAP/PEEP /Intermittent peep :1 - 35 cmH <sub>2</sub> O
21.	Pressure support - 0-100 cmH <sub>2</sub> O
22.	Pressure control :5 to 100 cmH <sub>2</sub> O

डा० अजित कुमार वर्मा  
अध्यक्ष  
एनेस्थीसियोलॉजी, सिविल सर्जरी  
एवं रीसिडेंसियल  
जी.एस.डी.एस. मेडिकल कॉलेज  
कानपुर

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S. Lucknow  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Dr. O.P. Sateev  
Assoc. Professor  
Dept. of Emergency Medicine  
S.G.P.G.I.M.S., Lucknow

23.	Pressure ramp 0 to 2000ms.
24.	Respiratory rate: 1-80bpm
25.	Inspiratory Time - 0.1-10sec
26.	I:E ratio 1:5 to 4:1
27.	Trigger sensitivity: - Flow 0.5 to 20 l/min, Pressure Trigger: -0.1 to -15 cm H <sub>2</sub> O.
28.	Expiratory trigger sensitivity (cycle) 5 to 80% of inspiratory peak flow.
29.	Occlusion pressure should be available P0.1
30.	FI0 <sub>2</sub> 21-100%
31.	Should have facility for a) Manual Breath b) standby c) screen-lock d) Inspiratory hold e) Expiratory Hold f) Suctioning tool g) Configurable Quick Start-Settings
32.	Should be able to measure intrinsic PEEP
33.	should have a display of weaning parameters like RSBI, expiratory time constant (RC Exp), PNIF, WOBI, Elastance & Pressure Time Product. (Pressure generated by respiratory muscles during inspiration).
34.	It should display breath to breath measured values of tidal volume; minute volume, spontaneous frequency, FIO <sub>2</sub> , Peak, Pmean, PEEP, Pplateau, Resistance, compliances and ETCO <sub>2</sub> monitoring
35.	Ventilator should have the facility of P-V tool to find the recruitability of the ARDS Lung along with the facility to calculate the LIP and UIP.
36.	Should have following Alarms: a) Low/high minute volume b) Low/high Pressure c) Low/high tidal volume d) low/ high Rate e) Apnea time f) low/high oxygen g) Loss of PEEP h) Patient Disconnection i) Exhalation obstruction j) Power supply k) Batteries l) Gas supply failure
37.	The ventilator should have standard facilities like a) Trans pulmonary Pressure Monitoring b) Tube resistance Compensation.

डा. अमिता कुमार वर्मा  
अध्यक्ष  
एनेस्थीसियोलॉजी, सिविल सर्जरी केंद्र  
एच.के.एम. मेडिकल कॉलेज  
कानपुर

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine SGRGIMS, Lucknow  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Sanjeev  
Asst. Professor  
Emergency Medicine  
SGRGIMS, Lucknow

38.	should have inbuilt battery back-up for at least 90 minutes for ventilator in the event of Power failure
39.	It should have simultaneous display of a minimum 2 wave forms along with 2 loops and dynamic lung. The screen should display the following waveforms: a) Flow Vs time b) Pressure Vs time c) Volume Vs time d) ASV/AVM Minute ventilation Graph and following loops e) Pressure-volume f) Flow-volume g) Flow-pressure
40.	Ventilator should have inbuilt FIO <sub>2</sub> Monitoring
41.	The flow sensor should be reusable and should be covered during the warranty period with no additional cost.
42.	Should have auto reusable expiration cassette/valves for complete disinfection capability.
43.	Should be supplied with vibrating mesh Nebulizer
44.	Should have Interface connecting facility to patient data management system.
45.	<b>Up-gradation features:</b> a) Automatic Adjustment of Oxygenation and Ventilation covering all applications through close loop features. b) Neonatal mode
46.	<b>Certification</b> a) The ventilator should be US FDA and EU CE from Notified body. b) ISO13485 certificate issued by organization accredited by IAF (International Accreditation Forum) c) The quoted model should be CDSCO approved for Manufacturer or Importer
47.	<b>Scope of supply should include the following with each ventilator</b> a) corrosion free ventilator cart /trolley with circuit holding arm from the same source b) Breathing circuit disposable with HMEF for adult & ped 10 pcs each c) Oxygen connecting hose and air connecting hose (if needed ) 1 pc each d) Vibrating mesh Nebulizer e) Side stream/ main stream ETCO <sub>2</sub> f) Test lung and instruction manual

**NOTE:**

- Those colleges /institute who don't have compressed air supply at places where ventilator is intended to be used should include compressor as scope of supply: 1.5 Lacs
- Servo Controlled Humidifier: 1 Lac
- Neonates mode up-gradation: 1.5 Lacs
- Automatic Adjustment of Oxygenation and Ventilation covering all applications: 8 Lacs

डा. जितेंद्र सिंह चहार  
आचार्य  
एनेस्थीसियोलॉजी, इन्टेंसिव केयर  
का रीन मेडिसिन  
जी.एस.पी.एस. मेडिकल कॉलेज  
कानपुर

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Dr. O.P. Saher  
Assoc. Prof.  
Dept. of Emergency  
SGPGIMS, Lucknow

## Basic Anesthesia Workstation

(Intended for providing anaesthesia in basic OTs for major/minor surgeries and monitored anaesthesia care)

S. No.	Technical Specification
1	Anesthesia Workstation should be complete with Anesthesia gas delivery system, Circle absorber system, inbuilt anesthesia ventilator.
2	Anesthesia Workstation should ventilate the patient range from infant to adult.
3	Anesthesia machine should have inbuilt capnography with sidestream monitoring
4	Anesthesia Workstation must have in built battery backup of 90 minutes.
5	<b>Flow management:</b>
	i. Should be Compact, ergonomic & easy to use.
	ii. Multi-color touch screen display of at least 10.1" size, with cascaded flow meters for O <sub>2</sub> & N <sub>2</sub> O.
	iii. Should have O <sub>2</sub> Flush having a flow of 25 to 75 LPM.
	iv. Gas regulators should be of modular design and have display of individual pressure of connected gases.
	v. One no. yoke each for Oxygen & Nitrous Oxide, Separate Pipeline inlet for 1 x Oxygen & 1 x Nitrous oxide.
	vi. Hypoxic Guard to ensure minimum 25% O <sub>2</sub> across all O <sub>2</sub> -N <sub>2</sub> O mixtures and Oxygen Failure warning.
	vii. The anesthesia machine should be low flow capable.
	viii. Fresh gas flow range should be from 0- 10 L/min each for O <sub>2</sub> & N <sub>2</sub> O.
	ix. In the event of complete power loss and battery failure it shall be possible to manually ventilate at 100% O <sub>2</sub> and deliver anesthetic agents.
6	<b>Breathing system</b>
	a) Latex free fully autoclavable, easy to dismantle the breathing system
	b) Flow and Oxygen Sensor connections shall be internal to help prevent disconnect,
	c) Sensor should not require daily maintenance.
	d) Bag to vent switch shall be available and begins mechanical ventilation in the ventilator position.
	e) Adjustable pressure limiting valve upto 70cm H <sub>2</sub> O
	f) Compact breathing system should be supplied with CO <sub>2</sub> absorbent canister of capacity more than 800 Gms and should be reusable and autoclavable at 134 degrees.
	g) The circle absorber system should have pressure gauge.
	h) Fresh gas compensated breathing heating system should be available.
	i) Flow sensors should be available in both inspiratory & expiratory parts of the breathing system.
	j) Should have facility for automatic moisture removal by heated system.
	k) CO <sub>2</sub> bypass facility should be available as standard.

डा० जितेंद्र चहार वर्मा  
 सहायक प्राध्यापक  
 एनेस्थीसियोलॉजी, इन्सिडेंट केंद्र  
 एवं हेमो-नेफ्रोलॉजी  
 जी.एस.जी.एम. मेडिकल कॉलेज  
 कानपुर

Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anesthesiology, S.G.P.G.I.M.S., Lucknow

Dr. O.P. Sanjeev  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGP.GIMS, Lucknow

7	<b>Vaporizer</b>	
	a) The new generation Vaporizer must be isolated from the gas flow in the off position and prevent the simultaneous activation of more than one vaporizer.	
	b) Vaporizers should mount to a Selectatec manifold of 2 vaporizers, which allows easy exchange between agents. Temperature, pressure and flow compensated vaporizers and Maintenance free for Isoflurane.	
	c) Isoflurane and sevoflurane vaporizer to be provided.	
	d) The vaporizer should be maintenance free and should not require any calibration.	
8	<b>Ventilation</b>	
	a) The workstation should have in-built Anesthesia Ventilator system, having the following standard modes: -	
	i) Volume Controlled	
	ii) Pressure Controlled	
	iii) VC - SIMV	
	iv) PC - SIMV	
	v) Pressure Support Ventilation with Apnoea Back up	
	b) It should have flow trigger having a range of 1 to 15 LPM	
	c) It should have pressure trigger having a range of PEEP-1 to PEEP-20 cmH <sub>2</sub> O.	
	d) Tidal volume: 20 ml-1500 ml (Volume Controlled Ventilation)	
	e) The mandatory rate should range from 4-100 breaths / min	
	f) Monitoring of Pressure (Pressure - Peak, Mean, Plateau, PEEP), Volume (Volume- V <sub>t</sub> , V <sub>e</sub> , MV, MV <sub>spn</sub> , Rate, Spontaneous, I:E ratio) & Oxygen parameters (Rate, I:E, Oxygen- FiO <sub>2</sub> )	
	g) Should monitor patient resistance & compliance.	
	h) Should have simultaneous waveforms of Pressure Vs Time, Volume Vs Time & Flow Vs Time. Capnography waveform should be available.	
	i) Ventilator should have direct setting of Tip:Ti upto 60% in order to achieve desired plateau.	
	j) It should be pneumatically / electrically driven and electronically controlled.	
9	The AGSS port should be available as a standard.	
10	The front casters should have individual brakes & it should also have two large drawers to store the desired accessories or drugs.	
<b>Monitor Specifications: -</b>		
1	Should be suitable for adult, paediatric and neonatal patient monitoring.	
2	Should have 12" or more TFT Display with touchscreen and optical encoder for multi-functionality	
3	It should have 5-Lead ECG, Spo <sub>2</sub> (Nellcor/Masimo or Equivalent), NIBP, IBP, Respiration Rate and Temperature	
4	It should have minimum 8 waveforms simultaneously	

डॉ. अमित कुमार वर्मा  
अध्यक्ष  
एनेस्थीसियोलॉजी, चिकित्सा केंद्र  
एच. एन. मेडिकल  
जी.एस.वी.एम. मेडिकल कॉलेज  
कानपुर

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

Dr. P.K. Sanjeev  
Assoc. Professor  
Dept. of Emergency Medicine  
SGSIMS, Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

5	ECG sweep Speed from 12.5 to 50 mm/sec.
6	It should have ST Segment analysis and arrhythmia monitoring
7	SpO2 Transducer should be Dual wavelength LED having measuring range from 35 to 100%.
8	Apnoea Alarm from 5 to 120 from user selectable ECG lead 1 or ECG lead 2.
9	NIBP in mmHg/kPa from 30 to 260 mmHg with Manual, Stat, Auto mode along with customised Multicycle mode.
10	Respiratory Rate from 0 to 120 rpm
11	Temperature from 15 to 45 Degree
12	It Should have records of 2000 or more arrhythmia events, 2000 NIBP readings, 100 or more hours of ECG waveforms storage, 2000 or more Alarm Events storage, 2000 or more Spo2 readings
14	Should be provided with one set of 5 Lead ECG cable, one set each of Adult & Pediatric SpO2 Probe, One set each of Adult, Pediatric and Infant NBP cuff and One set of rectal / oesophageal temperature sensor.
15	Should have graphical and tabular trend of 72 hours or more
16	Battery back-up should be 3 hours
17	Data export and connectivity to Central Monitoring Station
18	Network capability both through LAN for Central Monitoring
19	Should have Defibrillator and ESU protection
20	The monitor should be US FDA - 510k / EU CE Notified/ BIS approved IS with License number.
21	ISO13485 certificate issued by organization accredited by IAF (International Accreditation Forum)
22	The quoted model should be CDSCO approved for Manufacturer or Importer

#### Future up gradation facility required

1	Ability to major cardiac output
2	BIS
3	NMT

#### Certifications

1	The anaesthesia machine and monitor should be US FDA / EU CE Notified/ BIS approved IS with License number.
2	ISO13485 certificate issued by organization accredited by IAF (International Accreditation Forum)
3	The quoted model should be CDSCO approved for Manufacturer or Importer

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

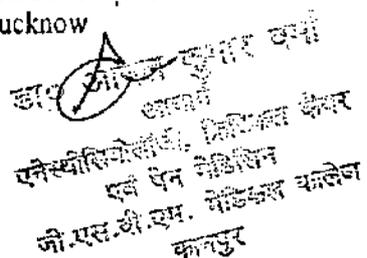
डा० जितेंद्र कुमार चहार्  
असिस्टन्ट प्रोफेसर  
एनेस्थीसियोलॉजी, इमिजिनेन्स क्लिनिक  
एल वन मेडिकल  
जी.एस.पी.एम. मेडिकल कॉलेज  
लखनऊ

Dr. P.K. Das  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

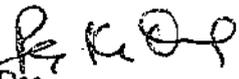
## Scope of supply

- Anaesthesia machine: 1
- Monitor: 1
- Anesthesia Gas Module – 1
- Water trap with sampling line – 50 Set
- Reusable Adult Silicon circuit – 2Nos.
- Reusable Pediatric Silicon Circuit – 1Nos.
- Disposable breathing circuit – 20
- Face Mask size (0 – 5) – 1 Set
- Rebreathing Bag 0.5Ltr, 1Ltr and 2Ltr – 2 Each
- Soda Lime – 18Kg
- Vaporizer: Isoflurane – 01 No., Sevoflurane – 01 No.
- ECG Cable – 2 Nos.
- ECG 5 Lead Set – 4 Nos.
- NIBP Hose – 2
- NIBP Cuff Size – Child, Pediatric, Small Adult, Adult – 5 Each
- SpO<sub>2</sub> Cable – 2 Nos.
- SpO<sub>2</sub> Probe Adult – 2 Nos.
- SpO<sub>2</sub> Probe Pediatric – 1 Nos.
- Skin Temperature Probe – 1 Nos.
- Nasopharyngeal Temperature Probe: Adult 1, Pediatric 1
- IBP Cable – 2 Nos.
- IBP Transducers: Disposable 5 nos
- Maintenance record register: 1

  
 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 डॉ. जितेंद्र कुमार चहार  
 एनेस्थीसियोलॉजी, इंटिग्रेटिव क्लिनिक  
 एवं पैन मेडिसिन  
 जी.एस.जी.एम. मेडिकल कॉलेज  
 कानपुर

  
 Dr. P.K. Das  
 Associate Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

Following upgrades may be asked by the department if needed with approximate price

1. Ability to major cardiac output: 2.5 Lacs
2. BIS: 3.5 LAcs
3. NMT: 4.5 Lacs

  
 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 डा० अशोक कुमार वर्मा  
 जागरण  
 एनेस्थीसियोलॉजी, इन्सिजल केयर  
 एवं पैन मैनेज्मन्ट  
 जी.एस.पी.एम. मेडिकल कॉलेज  
 काशीपुर

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Dr. Rajeev  
 Assoc Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

## High End Anesthesia Workstation

(Intended for providing anesthesia in advanced OTs for major surgeries)

Sr. No.	Technical Specification
1.	<p><b>General Points:</b></p> <ul style="list-style-type: none"> <li>• It should be integrated anesthesia workstation with monitor from same company capable of providing anesthesia to adult, pediatric and neonatal patients.</li> <li>• The machine should be suitable for low and minimal flow anesthesia application.</li> <li>• It should have configurable screen layouts for individual screen set ups.</li> <li>• Single user interface should control and display all parameter including control of modes, display of cylinder pressures etc.</li> <li>• Should be provided two or more drawers for storage space.</li> <li>• Anesthesia machine and monitor should be from the same company</li> </ul>
2.	<p><b>Gas Management:</b></p> <ul style="list-style-type: none"> <li>• Three Gas system : Oxygen , compressed air, Nitrous Oxide</li> <li>• Should have pin indexed yoke assembly for oxygen and nitrous oxide one each.</li> <li>• Pipeline inlet for Oxygen, compressed air, Nitrous Oxide</li> <li>• Oxygen Concentration: 25% to 100%</li> <li>• Should have Extra flow meters for oxygen.</li> <li>• Machine should have Digital display of pressure value for Cylinders and pipeline pressures.</li> <li>• Machine should have Electronic Virtual flowmeter with digital measurement of individual and total flow for Oxygen, Nitrous-oxide and Air.</li> <li>• Oxygen Flush between 35 lpm -70 lpm.</li> <li>• Should have a decision support tool for optimizing FGF.</li> <li>• Colour coded high pressure tubings 5 meter long for oxygen, nitrous oxide and air with suitable pipeline connectors.</li> <li>• Hypoxic guard to ensure minimum 25% oxygen across all O<sub>2</sub>-N<sub>2</sub>O mixtures.</li> <li>• Oxygen failure warning device. All alarms to be audio as well as visual.</li> <li>• Should have atleast oxygen back up mechanical flow control in case of failure of electronics</li> </ul>
3.	<p><b>Breathing System:</b></p> <ul style="list-style-type: none"> <li>• Breathing system shall be fully autoclavable to 134° C and natural latex free. It should be compact.</li> <li>• Total circuit volume shall not exceed 3 L, including Absorber volume.</li> <li>• Ventilator bellows/piston shall be integrally mounted to the breathing system. Should have Ascending Bellows/piston design.</li> <li>• Bag to vent switch shall be bi-stable and automatically begins mechanical ventilation in the ventilator position.</li> <li>• Adjustable pressure limiting valve shall be flow and pressure compensated.</li> <li>• APL Valve assembly and bag mount should be conveniently placed.</li> <li>• Machine shall provide circle mode breathing circuits.</li> <li>• Components coming in contact with patient gas shall be disposable or autoclavable.</li> <li>• O<sub>2</sub> sensor either paramagnetic type/ others, will be covered under warranty and CMC without any incurring cost to the user.</li> </ul>

  
 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow  
 डॉ० जितेंद्र कुमार चहार्  
 सहायक प्राध्यापक  
 कठिन चिकित्सा विभाग  
 स.ग.प.ग.ी.एम. लखनऊ  
 काठपुर

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Assoc. Professor  
 Dept. of Emergency Med  
 SGPGIMS, Lucknow

	<ul style="list-style-type: none"> <li>Flow sensing should be at both inspiratory and expiratory port, the flow sensors should be autoclavable.</li> <li>Common Gas outlet should be standard supply for connecting open circuit.</li> <li>Machine should have CO<sub>2</sub> absorber system with the following features: -           <ol style="list-style-type: none"> <li>Single/Double canister.</li> <li>It should be autoclavable.</li> <li>Canister capacity should be 1000 mL or more.</li> <li>It should be possible to bypass the canister if removed during clinical cases to change soda lime.</li> </ol> </li> <li>AGSS ready to be connected to hospital installed active system</li> </ul>
4.	<b>Vaporizers:</b> <ul style="list-style-type: none"> <li>Vaporizer must be isolated from the gas flow in the off position and prevent the simultaneous activation of more than one vaporizer.</li> <li>Vaporizer shall require no tools to mount.</li> <li>Vaporizer shall mount to a Selectatec® manifold which allows easy exchange between agents.</li> <li>Supplier must offer total vaporizer manufacturing capability-Desflurane, Sevoflurane, and Isoflurane. Sevoflurane and isoflurane vaporizers to be standard accessories. Desflurane vaporizer of same manufacturer to be optional and price to be quoted.</li> <li>Back bar to accept two selectatec vaporizers</li> </ul>
5.	<b>Ventilation</b> <ul style="list-style-type: none"> <li>Should be Electronically controlled and Pneumatically/ Electrically driven through advanced Flow control valve</li> <li>Should calculate ventilator settings based on patient's weight.</li> <li>Should have VCV, PCV, SIMV-PCV, SIMV-VC, Pressure support with apnea backup, dual ventilation mode PCV-VG /PRVC/ AUTOFLOW and CPAP</li> <li>Option of using either Air or Oxygen as driving gas</li> <li>Modes of Ventilation: VCV, PCV, SIMV (Volume &amp; Pressure), CPAP Loops, integrated PEEP adjustment.</li> <li>Cardiac bypass mode</li> <li>Tidal Volume: 20ml to 1200ml in Volume mode</li> <li>Respiratory Rate : 4 to 80bpm</li> <li>Peep : Off, 4 to 30cms H<sub>2</sub>O</li> <li>Settable I:E ratios (2:1 to 1:8), Pause, Trigger, Insp Pressure from 5 upto 50cms H<sub>2</sub>O</li> <li>Ventilator shall be capable of 100 L/min peak flow .</li> <li>Ventilator shall have leak and compliance test and dynamic tidal volume compensation. Operates on a breath-by-breath basis and does not require special calibration.</li> <li>Ventilator shall have a "bag mode" to allow manual ventilation totally separate from the electronic componentry of the system..</li> <li>Should have Cardiac bypass mode.</li> <li>It should have Pause Gas flow /Systematic Lung Recruitment facility.</li> <li>Should have ventilatory parameter trends of at least 12Hrs or more.</li> <li>Should have a battery backup of at least 60 minutes.</li> </ul>
6.	<b>Display:</b> <ul style="list-style-type: none"> <li>Minimum 15 inches screen</li> <li>Waveforms: Pressure, Flow vs Time</li> <li>Loops: Pressure vs Volume, Flow vs Volume</li> </ul>

  
 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Dr. A. K. Singh  
 Assistant Professor  
 Emergency Medicine  
 Lucknow

	<ul style="list-style-type: none"> <li>• Display all set and Monitored parameters like Volumes, Rate, Timing, Pressure, Pressure of Inlet Gases</li> <li>• Should display consumed amount of Gases and Anaesthetic agent when Anaesthesia Gas Monitor module is connected.</li> <li>• Should display O<sub>2</sub>, CO<sub>2</sub>, detected Agent waveforms, Insp and Exp FO<sub>2</sub>, N<sub>2</sub>O, EtCO<sub>2</sub>, Agent Conc values &amp; MAC</li> <li>• The gas module must use universal kind of Water trap and sampling line for adult to neonatal patients and the sample flow selection must be automatic</li> </ul>
7.	<b>Power:</b> <ul style="list-style-type: none"> <li>• Will work on electric mains</li> <li>• Anaesthesia workstation should have an individual battery backup of up to 45mins on fully charged battery.</li> <li>• Should have integrated lighting for vaporizers and working table(optional)</li> </ul>
8.	<b>Braking Mechanism</b> <ul style="list-style-type: none"> <li>• Front caster wheel should have a central baking mechanism</li> </ul>
9.	<b>Monitor</b> <ul style="list-style-type: none"> <li>• Monitor should be Modular design with flexible monitoring</li> <li>• High visibility with large color screen and additional alarm light</li> <li>• Screen Size should be minimum 15 inches TFT colour touch screen display and highly visible alarm light</li> <li>• Up to 8 waveforms/ 4 digit fields, 7 optimized user modes, Standard Adult, Pediatric &amp; Neonate mode with OxyCRG</li> <li>• Easy to set with Comp wheel, Split screen facility to view Mini trend for 5-30 mins,</li> <li>• Trend up to 72 hours of graphic and numerical data</li> <li>• Should have an individual Battery backup, minimum of 2 hrs.</li> <li>• ECG and IBP analog output. Should have arrhythmia and ST segment Analysis with ST Trend</li> <li>• Monitor should have Simultaneous Monitoring facility for 2xIBP &amp; 2xTemp for all monitors, BIS/ Entropy</li> <li>• Basic Patient side module for Measuring Parameters like 5 lead ECG, NIBP, SPO<sub>2</sub> Masimo SET, RESP, 2xIBP, 2xTemp, EtCO<sub>2</sub>( side stream)</li> <li>• Should have sweep speeds 6.25, 12.5 and 25 mm/sec, measured by the same ECG lead</li> <li>• Accessories - Standard use for ECG(1 in no.), SpO<sub>2</sub> probes (1 each for adult &amp; pediatric), NIBP(2 cuffs each for adult and pediatric &amp; 1 for neonate), Temperature probes( 1 for core and 1 for skin), IBP cables (2 in no with 10 pressure transducers and their one holder), EtCO<sub>2</sub>- 5 filter assemblies.</li> <li>• Should have facility to monitor SPV and PPV</li> <li>• Should be HL7 Compliant</li> <li>• Shall have color coding for different pressure waveforms.</li> <li>• Should be able to perform manual and Automatic Noninvasive Blood Pressure measurements.</li> <li>• Should be able to set alarm limits for all the measured Parameters using single function.</li> <li>• Should have Audio and Visual alarms with alarm light on display.</li> </ul>
10.	<b>Following upgrades should be available as options</b> 1. NMT module

  
 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 डा० जितेंद्र कुमार चहार्  
 जलकाय  
 एनेस्थीसियोलॉजी, इन्टेंसिव केयर  
 एं स गेन मेडिसिन  
 जी.एस.पी.एम. के.एल.एस. कालिदा  
 कामपुर

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Assoc. Prof.  
 Dept. of Emergency  
 SGPCHMS, Lu

2. <b>Cardiac Output module</b> for measuring the cardiac output using the thermo-dilution technique with four Invasive pressure channels.5.
3. <b>BIS/ Entropy</b>

### Certifications

1	The anaesthesia machine and monitor should be US FDA.
2	ISO13485 certificate issued by organization accredited by IAF (International Accreditation Forum)
3	The quoted model should be CDSCO approved for Manufacturer or Importer

### Scope of supply

<ul style="list-style-type: none"> <li>• Anaesthesia machine: 1</li> <li>• Monitor: 1</li> <li>• Anesthesia Gas Module - 1</li> <li>• Water trap with sampling line - 50 Set</li> <li>• Reusable Adult Silicon circuit - 2Nos.</li> <li>• Reusable Pediatric Silicon Circuit - 1Nos.</li> <li>• Disposable breathing circuit - 20</li> <li>• Face Mask size (0 - 5) - 2 Set</li> <li>• Rebreathing Bag 0.5Ltr, 1Ltr and 2Ltr - 2 Each</li> <li>• Soda Lime - 18Kg</li> <li>• Vaporizer: Isoflurane - 01 No., Sevoflurane - 01 No.</li> <li>• ECG Cable - 2 Nos.</li> <li>• ECG 5 Lead Set - 4 Nos.</li> <li>• NIBP Hose - 2</li> <li>• NIBP Cuff Size - Child, Pediatric, Small Adult, Adult - 5 Each</li> <li>• SpO<sub>2</sub> Cable - 2 Nos.</li> <li>• SpO<sub>2</sub> Probe Adult - 2 Nos.</li> <li>• SpO<sub>2</sub> Probe Pediatric - 1 Nos.</li> <li>• Skin Temperature Probe - 1 Nos.</li> <li>• Nasopharyngeal Temperature Probe: Adult 2, Pediatric 1</li> <li>• IBP Cable - 2 Nos.</li> <li>• IBP Transducers: Disposable 10 nos</li> <li>• Maintenance record register: 1</li> </ul>
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डा० अनिल कुमार वर्मा  
अध्यक्ष  
एनेस्थीसियोलॉजी, क्लिनिकल केयर  
एनेस्थीसियोलॉजी  
जी.एस.पी.एस. मेडिकल कॉलेज  
कानपुर

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Dr. Anil Kumar Banjeev  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

Following upgrades may be asked by the department if needed with approximate price

1. NMT module – 4.5 Lacs
2. BIS/Entropy – 3.5 Lacs
3. Cardiac Output module -2.5 Lacs

  
 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 डा० अनिल कुमार वर्मा  
 आचार्य  
 एनेस्थीसियोलॉजी, क्लिनिकल कैम्बर  
 एन येन मेडिसिन  
 जी.एस.जी.एम. मेडिकल कॉलेज  
 कानपुर

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Dr. O.P. Sanjeev  
 Assoc. Profess  
 Dept. of Emergency Med  
 SGPGIMS, Lucknow

## Advanced Anesthesia Workstation

(Intended use for providing anesthesia in advanced OTs for major/ long duration/ super-specialty/Transplant/ advanced surgeries)

Sr. No.	Technical Specification
1.	<p><b>General Points:</b></p> <ul style="list-style-type: none"> <li>• It should be integrated anesthesia workstation to provide anesthesia to adult, pediatric and neonatal patients.</li> <li>• The machine should be suitable for low and minimal flow anesthesia application.</li> <li>• It should have configurable screen layouts for individual screen setups.</li> <li>• Single user interface should control and display all parameter including control of modes, display of cylinder pressures etc.</li> <li>• Should be provided two or more drawers for storage space.</li> <li>• Entire anesthesia workstation including monitor, vaporizers &amp; gas module should be from same make</li> <li>• Front caster wheel should have a central braking mechanism</li> </ul>
2.	<p><b>Gas Management:</b></p> <ul style="list-style-type: none"> <li>• Three Gas system : Oxygen , Air, Nitrous Oxide</li> <li>• Should have pin indexed yoke assembly for oxygen and nitrous oxide one each.</li> <li>• Pipeline inlet for Oxygen, Air, Nitrous Oxide</li> <li>• Machine should have Digital display of pressure value for Cylinders and pipeline pressures.</li> <li>• Oxygen Concentration: 25% to 100%</li> <li>• Should have Extra flow meters for oxygen only.</li> <li>• Machine should have Electronic Virtual flowmeter with digital measurement of individual and total flow for Oxygen, Nitrous-oxide and Air.</li> <li>• Electronic gas mixing with auxiliary Oxygen Flowmeter.</li> <li>• Oxygen Flush between 30 lpm -70 lpm</li> <li>• Will have an additional optional receptacle for accepting/ integrating Anesthesia Gas monitoring module.</li> <li>• Should have a decision support tool for optimizing FGF.</li> <li>• The system must have a target control anesthesia/end tidal control tool where end tidal oxygen concentration &amp; end tidal agent concentration inputs would be used to automate the flow of fresh gas and agents</li> <li>• Colour coded high pressure tubings 5-meter long for oxygen, nitrous oxide and air with suitable pipeline connectors.</li> <li>• Hypoxic guard to ensure minimum 25% oxygen across all O<sub>2</sub>-N<sub>2</sub>O mixtures.</li> <li>• Oxygen failure warning device. All alarms to be audio as well as visual.</li> <li>• Should have atleast oxygen back up mechanical flow control in case of failure of electronics</li> </ul>
3.	<p><b>Vaporizers:</b></p> <ul style="list-style-type: none"> <li>• Electronically controlled delivery of agent with setting of the agent delivery from the display of the workstation.</li> <li>• Vaporizer must be isolated from the gas flow in the off position and prevent the</li> </ul>

  
**Dr. Jitendra Singh Chahar**  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
**Dr. P. Sanjeev**  
 Assoc. Profes  
 Dept. of Emergency Me  
 SGPIMS, Lucknow

	<p>simultaneous activation of more than one vaporizer.</p> <ul style="list-style-type: none"> <li>• Vaporizer shall require no tools to mount.</li> <li>• Must offer vaporizer manufacturing capability-Desflurane, Sevoflurane, and Isoflurane. Desflurane vaporizer of same manufacturer to be optional and price to be quoted.</li> <li>• Temperature / pressure compensated and flow independent vaporizer.</li> </ul>
4.	<p><b>Breathing System:</b></p> <ul style="list-style-type: none"> <li>• Breathing system shall be fully autoclavable to 134° C and natural latex free. It should be compact.</li> <li>• Total circuit volume shall not exceed 3 L, including Absorber volume.</li> <li>• Machine should have CO<sub>2</sub> absorber system with the following features: - <ul style="list-style-type: none"> <li>➤ Single/Double canister.</li> <li>➤ It should be autoclavable.</li> <li>➤ Canister capacity should be 1000 mL or more.</li> <li>➤ It should be possible to bypass the canister if removed during clinical cases to change soda lime.</li> </ul> </li> <li>• Breathing system shall have integrated Volume sensing and shall be of a type that does not require daily maintenance.</li> <li>• Ventilator bellows/piston shall be integrally mounted to the breathing system. Should have Ascending Bellows/piston design.</li> <li>• Bag to vent switch shall be bi-stable and automatically begins mechanical ventilation in the ventilator position.</li> <li>• Adjustable pressure limiting valve shall be flow and pressure compensated.</li> <li>• Machine shall provide circle mode breathing circuits.</li> <li>• FiO<sub>2</sub> monitoring should be available for both inspired &amp; expired oxygen concentration and should be of paramagnetic type/ others with 5 years warranty and should be replaced free of cost during CMC.</li> <li>• Flow sensing should be at both inspiratory and expiratory port, the flow sensors should be autoclavable</li> <li>• Common Gas outlet should be standard supply for connecting open circuit.</li> <li>• AGSS ready to be connected to hospital installed AGSS system</li> </ul>

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

डा० जितेंद्र कुमार चर्मा  
आचार्य  
एनेस्थीसियोलॉजी, क्लिनिकल कैर  
एवं रेन मेडिसिन  
जी.एस.टी.एन. मेडिकल कॉलेज  
कानपुर

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Dr. Sanjeev  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

5.	<p><b>Ventilation</b></p> <ul style="list-style-type: none"> <li>• Should be Electronically controlled and Pneumatically driven and Electronic Gas Mixing through advanced Flow control valve</li> <li>• Option of using either Air or Oxygen as driving gas</li> <li>• Should have VCV, PCV, SIMV-PCV, SIMV-VC, Pressure support with apnea backup, dual ventilation mode PCV-VG /PRVC/ AUTOFLOW and CPAP</li> <li>• Cardiac bypass mode</li> <li>• Tidal Volume: 20ml to 1500ml in Volume mode</li> <li>• Respiratory Rate : 4 to 80bpm</li> <li>• Peep : Off, 4 to 30cms H2O</li> <li>• Settable I:E ratios, Pause, Trigger, Insp Pressure from 5 upto 50cms H2O</li> <li>• Ventilator shall be capable of 120 L/min peak flow .</li> <li>• Ventilator shall have leak and compliance test and dynamic tidal volume compensation. Operates on a breath-by-breath basis and does not require special calibration.</li> <li>• Ventilator shall have a "bag mode" to allow manual ventilation totally separate from the electronic componentry of the system.</li> <li>• It should have colored touch screen with minimum 15" or more.</li> <li>• Waveforms: Pressure, Flow vs Time</li> <li>• Loops: Pressure vs Volume, Flow vs Volume</li> <li>• Display all set and Monitored parameters like Volumes, Rate, Timing, Pressure, Pressure of Inlet Gases</li> <li>• Should display consumed amount of Gases and Anaesthetic agent when Anaesthesia Gas Monitor module is connected.</li> <li>• Should display O2, CO2 , detected Agent waveforms, Insp and Exp FO2, N2O, EtCO2, Agent Conc values &amp; MAC</li> <li>• The gas module must use universal kind of Water trap and sampling line for adult to neonatal patients and the sample flow selection should be automatic</li> <li>• There should be lung protective ventilation technology backed by software including single-step and multi-step Lung Recruitment maneuvers to optimize clinical outcome</li> </ul>
6.	<p><b>Power:</b></p> <ul style="list-style-type: none"> <li>• Will work on electric mains</li> <li>• Anaesthesia workstation should have an individual battery backup of up to 45mins on fully charged battery.</li> <li>• Should have integrated lighting for vaporizers and working table(optional)</li> </ul>
7.	<p><b>Monitor</b></p> <ul style="list-style-type: none"> <li>• Monitor should be Modular design and flexible monitoring</li> <li>• High visibility with large color touch screen and alarm light</li> <li>• Screen Size should be minimum 19 inches colour touch screen display and highly visible alarm light</li> <li>• Up to 8 waveforms / 4 digit fields, 7 optimized user modes, Standard Adult, Pediatric &amp; Neonate mode with OxyCRG</li> <li>• Easy to set with Comp wheel , Split screen facility to view Mini trend for 5 -30 mins,</li> <li>• Trend up to 72 hours of graphic and numerical data</li> <li>• Should have an individual Battery backup, minimum of 2 hrs .</li> <li>• ECG and IBP analog output.</li> <li>• Should have arrhythmia and ST segment Analysis with ST Trend</li> <li>• Monitor should have Simultaneous Monitoring facility for 2xIBP &amp; 2xTemp for all</li> </ul>

  
**Dr. Jitendra Singh Chahar**  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
**डा० अनिल कुमार वर्मा**  
 Associate Professor  
 एनेस्थीसियोलॉजी, मिडिकल कैंसर  
 एवं पेन मेडिसिन  
 जी.एस.डी.एम. मेडिकल कॉलेज  
 कानपुर

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
**Sanjeev**  
 Assoc. Professor  
 Emergency Med  
 SGPIMS, Lucknow

	<p>monitors</p> <ul style="list-style-type: none"> <li>• Monitor should have Simultaneous Monitoring facility for ECG, Respiration, SpO<sub>2</sub>, NIBP, 2xIBP and 2xTemp.</li> <li>• Should be able to perform manual and Automatic Noninvasive Blood Pressure measurements.</li> <li>• Shall have color coding for different pressure waveforms.</li> <li>• Should have facility to monitor SPV and PPV</li> <li>• Should have facility Monitor Depth of Anesthesia monitoring i.e BIS / Entropy.</li> </ul>
8.	<p><b>Following upgrades should be available if required – (Quote unit prices in price bid)</b></p> <ol style="list-style-type: none"> <li>1. Module for monitoring Cardiac Output with the help of thermo-dilution or PiCCO technique</li> <li>2. Electronic charting system from the same OEM</li> <li>3. Module for NMT monitoring</li> </ol>

### Certifications

1	The anaesthesia machine and monitor should be US FDA.
2	ISO13485 certificate issued by organization accredited by IAF (International Accreditation Forum)
3	The quoted model should be CDSCO approved for Manufacturer or Importer

### Scope of supply

<ul style="list-style-type: none"> <li>• Anaesthesia machine: 1</li> <li>• Monitor: 1</li> <li>• Anesthesia Gas Module – 1</li> <li>• Water trap with sampling line – 50 Set</li> <li>• Reusable Adult Silicon circuit – 2Nos.</li> <li>• Reusable Pediatric Silicon Circuit – 1Nos.</li> <li>• Disposable breathing circuit – 20</li> <li>• Face Mask size (0 – 5) – 1 Set</li> <li>• Rebreathing Bag 0.5Ltr, 1Ltr and 2Ltr – 2 Each</li> <li>• Soda Lime – 18Kg</li> <li>• Vaporizer: Isoflurane – 01 No., Sevoflurane – 01 No.</li> <li>• ECG Cable – 2 Nos.</li> <li>• ECG 5 Lead Set – 4 Nos.</li> <li>• NIBP Hose – 2</li> <li>• NIBP Cuff Size – Child, Pediatric, Small Adult, Adult – 5 Each</li> <li>• SpO<sub>2</sub> Cable – 2 Nos.</li> <li>• SpO<sub>2</sub> Probe Adult – 2 Nos.</li> <li>• SpO<sub>2</sub> Probe Pediatric – 1 Nos.</li> </ul>	<p>Dr. Jitendra Singh Chahar Assistant Professor Department of Critical Care Medicine S.G.P.G.I.M.S., Lucknow</p>
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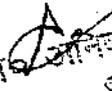
डा. अनिल कुमार वर्मा  
जयपुर  
एनेस्थीसियोलॉजी, सिविल कैंसर  
एवं डेन मेडिसिन  
जी.एस.बी.एम. मेडिकल कॉलेज  
जयपुर

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Dr. P. Sanjay  
Assoc. Prof  
Dept. of Emergency &  
SGPGIMS, Luc

- Skin Temperature Probe – 1 Nos.
- Nasopharyngeal Temperature Probe: Adult 1, Pediatric 1
- IBP Cable – 2 Nos.
- IBP Transducers: Disposable 5 nos
- Maintenance record register: 1

  
 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 डॉ. अनिल कुमार शर्मा  
 आचार्य  
 एनेस्थीसियोलॉजी, क्रिटिकल केयर  
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 लखनऊ

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Dr. O.P. Sanjeev  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 S.G.P.G.I.M.S., Lucknow

Following upgrades may be asked by the department if needed with approximate price

1. NMT module - 4.5 Lacs
2. Cardiac Output module (Thermodilution): 2.5 Lacs
3. Module for monitoring Cardiac Output with the help of PiCCO technique: 2.5 Lacs
5. Electronic charting system from the same OEM: 10 Lacs for first machine and their after around 2.5 Lacs for additional each machine



Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

डा. अजय कुमार वर्मा  
जन्म  
एनेस्थीसियोलॉजी, क्रिटिकल केयर  
एवं पैल मेडिसिन  
जी.एस.पी.एम. मेडिकल कॉलेज  
काशीपुर

Dr. O.P. Sanjeev  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow



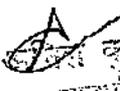
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

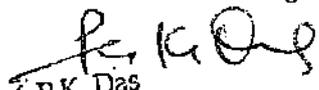
## 5L oxygen concentrator

1. Oxygen Concentrator (5LPM) with standard accessories (Mask, Tubing, Power Cord, Humidifying Bottle, Operational Manual).
2. Specifications:
  - a) Oxygen Concentration at 5 LPM = 93 % ( $\pm$  3%)
  - b) Litre Flow = 0.5 to 5 Litres per Minute (with setting in 0.5 increment)
  - c) Outlet Pressure = 5psi ( $\pm$  0.5)
  - d) Sound Level = Less than 45 dB
  - e) Operating Humidity upto 95% relative Humidity
  - f) Startup Time not more than 15 Minutes
  - g) Alarm for Power Failure and low oxygen concentration
  - h) Power consumption < 350 Watts
3. Scope of supply:
  - a) Oxygen concentrator unit- 1no.
  - b) Mask- 15 nos of different size.
  - c) Tubing- 15 nos.
  - d) Nasal cannula- 15 nos of different size.
  - e) Humidifier Bottle- 2 nos.
  - f) Power cord- 1 no.
4. Item should be BIS/CE/FDA Approved

  
 Dr. Jitendra Singh Chahar,  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 Dr. O.P. Sanjeev  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGP GIMS, Lucknow

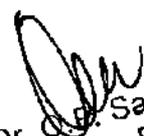
  
 डा० प्रकाश कुमार वर्मा  
 अध्यक्ष  
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 काशीपुर

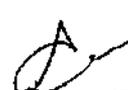
  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## Oxygen Concentrator 10L

1. Oxygen Concentrator (10 LPM) with standard accessories (Mask, Tubing, Power Cord, Humidifying Bottle, Operational Manual).
2. Specifications:-
  - a) Oxygen Concentration at 6 LPM = 93 %( $\pm$  3%) and at 10 LPM=90%( $\pm$  3%)
  - b) Liter Flow = 0.5 to 10 Liters per Minute(with setting in 0.5 Liters increment)
  - c) Outlet Pressure >10psi(More Than 10psi)
  - d) Sound Level= Less than 60 dB
  - e) Operating Humidity up to 95% relative Humidity
  - f) Startup Time not more than 15 Minutes
  - g) Alarm for Power Failure and low oxygen concentration
  - h) Power consumption < 350 Watts
3. Scope of supply:
  - a) Oxygen concentrator unit- 1no.
  - b) Mask- 15 nos of different size.
  - c) Tubing- 15 nos.
  - d) Nasal cannula- 15 nos of different size.
  - e) Humidifier Bottle- 2 nos.
  - f) Power cord- 1 no.
4. Item should be BIS/CE/FDA Approved

  
 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 Dr. Sanjeev  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

  
 डा० अनिल कुमार वर्मा  
 अध्यक्ष  
 एनेस्थीसियोलॉजी, इंटिग्रेटिव केंद्र  
 एम. सी. मेडिकल  
 जी.एस.पी.जी.एम. संशोधन केंद्र

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## Basic ECG Machine 12 Channels

Technical Specification		
1.	Power Supply	AC Power Supply 100-240 VAC
2.	Rated Frequency	50/60Hz
3.	Rated Power	130VA
4.	Battery	Built-in-Lithium Rechargeable 14.4 V, 4400mAh, Charging Time: 8Hrs, Cycle Life: 300 Times
5.	Fuse	T4AH250V Ø5 x 20
6.	Electromagnetic Compatibility	IEC 60601-1-2
7.		
8.	Functional Features	7 Inches bright TFT with touchscreen, real time 12 Channel Display ECG measurement & analysis function Three types of operation: AUTO, MANUAL & RR ANA Eight manual print types: 12x1, 12x1+P, 6Tx2, 6x2+1Rhythm, 6x2+1R+P, 3x4+3R, 3x4+1R+P, 3x4+1R+P+Templates It can connect with Laser Printer, Bar Code Scanner & can support SD card/USB Drive Clinical Information: Patient ID, Gender, Age, Height, Weight, Technician, Doctor, Bed No, Blood Pressure & Hospital Information Automatic adjustment of baseline for optimal recording Internal storage of 5000 or more ECG reports & auto save option after print Date & Time settings Touchscreen & Hard keys both is available for easy operation Auto Shutdown Function Pacemaker detection Minnesota Code
9.		
10.	Filters	AC Filter: AC Off, 50Hz, 60Hz EMG Filter: EMG Off, 25Hz, 35Hz, 45Hz ADS Filter: Off, .05Hz, .015Hz, .25Hz, .32Hz, .5Hz, .67Hz Low Passed Filter: 75Hz, 90Hz, 100Hz, 165Hz & off.
11.	Sensitivity	Auto, 2.5, 5, 10, 10, 40mm/mV

डा. अजय कुमार वर्मा  
जाबार्थ  
एनेस्थीसियोलॉजी, क्रिटिकल केयर  
एवं रीजिस्ट्रेशन  
जी.एस.डी.एम. मेडिकल कॉलेज  
कानपुर

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

Dr. O.P. Banje  
Assoc. Professor  
Dept. of Emergency Med.  
SGPGIMS, Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

12.	Communication Ports	Functional RS232 port for PC connectivity & ECG data transfer to PC, functional USB port to store ECG in pdf format, LAN interface for communication between ECG & Workstation.
13.	Net Weight	< 3.5 Kg
14.	Environment	Storage Temperature -10°C-55°C, Operation Temp. 5°C-40°C Relative Humidity Storage 25-85%, Operation 25-85% Atmospheric Pressure Storage 700hpa-1060hPa, Operation 700hpa-1060hPa 210/216mm, Print Width : 200/206mm
15.	Paper Width	
16.	HR Range	30-250 BPM; Accuracy $\pm 1$ BPM
17.	Leads	12 Standard Leads (10 Lead Cable)
18.	Acquisition	12 Lead Simultaneous
19.	Sampling Rate	8000Hz
20.	A/D Switch	24 bits
21.	Frequency Response	.05Hz $\sim$ 165Hz
22.	Input Impedance	>50M $\Omega$ (10Hz)
23.	Noise	<15 $\mu$ A I
24.	CMRR	$\geq 120$ dbI
25.	Patient Leakage Current	$\geq 10\mu$ A (A/C)
26.	Certifications:	<ul style="list-style-type: none"> <li>• US FDA / EU CE 4 digit notified / BIS with CML Number</li> <li>• CDSO Certificate</li> <li>• IEC60601-1: 2005+A1:2012 ; IEC60601-2-25:2011, IEC60601-2: 2014</li> </ul>

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

डा० जितेंद्र कुमार चर्मा  
उपाध्यक्ष  
एनेस्थीसियोलॉजी, सिटिकल केयर  
आर एन केडिसिन  
जी.एस.जी.एम. मेडिकल कॉलेज  
कागपुर

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Asstt. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

## Advanced ECG Machine

### General Requirements:

1. The ECG Machine should be able to acquire all 12 Leads simultaneously for both adult and pediatric patients.
2. Should have facility to interpret 12 lead and derive 6 more ECGs of back (V7, V8, and V9) and right chest region (V3R, V4R, V5R).
3. Must be able to display all 12 lead ECG and other data on bright color back lit LCD With minimum 7 inch display.
4. Should display all ECG waveforms, patient information, heart rate, QRS mark, error messages; 12 lead ECG display with Print Preview; QTc interval; HRV analysis, recording speed change option
5. Should be easy-to-operate, compact and light weight, with weight not exceeding 5kg including battery.
6. Should have alpha numeric key board for patient data entry.

### Operational Requirements:

1. Machine should have inbuilt thermal recorder to print 12 lead ECG with analysis results On 210 mm wide thermal ECG paper.
2. Machine should have different formats of recording ECG like 3, 4, 6 and 12 channels ECG.
3. Should have rhythm recording (cascaded ECG) for 1 or 3 channel ECG lead.
4. Should have extended recording in case of arrhythmia detection, recording of rhythm and effected lead group should be automatically extended.
5. Should have both manual and automatic recording.
6. Should have large memory capacity: up to 300 ECG files in internal memory and 2000 ECG files in SD memory card/ USB.
7. Should operate on both battery and mains power supply.
8. Should operate with line voltage range from 100-240VAC, 50/60Hz.
9. Should have in built battery for at least 30 min continuous ECG recording.

### Technical Requirements:

1. Should have AC and EMG suppression and high pass frequency filters.
2. Should display Real time ECG waveforms with signal quality indication for each lead in case of any electrode detachment or noise.
3. Should have
  - a. Sampling rate: 6000sample/s.
  - b. AC interference filter: 50/60Hz
  - c. High cut filter: 75, 100, 150Hz
  - d. EMG suppression filter: 25, 35Hz
  - e. CMRR: >105db
4. It should save ECG data and waveform in PDF format and can be transfer to SD Memory Card/ USB.
5. Should have the facility to review and manage ECG data on a Windows @ PC with optional viewer software.
6. Machine should have facility to connect to Hospital network (HIS) through LAN and Wireless connectivity.

### Other Requirements:

1. Should comply with IEC standard for digital electro cardio graphs specifying accuracy of Signal processing, ECG measurement and analysis.
2. The company should have local service engineer to rectify any technical problem immediately.

Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.R.G.I.M.S., Lucknow

डा० अनिल कुमार वर्मा  
 आचार्य  
 जे.एस.जी.एम. मेडिकल कालेज  
 कानपुर

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

Dr. O.P. San  
 Assoc. Pro  
 Dept. of Emergency  
 S.G.P.G.I.M.S., Lucknow

**Certifications:**

1. Should be European CE (with four digit notified body) approved or US-FDA approved.

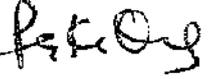
**Scope of supply should include**

- a. ECG Machine 12 Leads with Interpretation- 01 Nos.
  - b. Patient ECG Cable- 02 Nos.
  - c. Chest Electrodes Adult (set of six)- 01 Nos.
  - d. Limb Electrodes (set of 4)- 01 Nos.
  - e. Thermal Paper A4 Size (210mmx100m)- 50 Nos.
  - f. Trolley from same manufacturer as of ECG Machine -01 Nos.
  - g. Grounding earth wire cable- 01 Nos.
5. Manufacturer should ensure proper after sale services & company should provide the Service directly not by channel partner to ensure maximum up time of the equipment by local service center.
  6. List of Installation should be attached
  7. Demonstration must be provided by OEM/ Dealer cost at Institute premises.

  
 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 डा० अनिल कुमार शर्मा  
 प्राध्यापक  
 एनेस्थीसियोलॉजी, क्लिनिकल केंद्र  
 एम.एस.सी.एम. मेडिकल कॉलेज  
 काशीपुर

  
 Dr. O.P. Shrivastava  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**Ambu Bag Adult****Specification:**

1. Semi-transparent/ transparent Resuscitator bag adult with face mask of size 3-5.
2. Tidal volume of approximate 1500 ml, the outer cover of bag should be 100 % latex free, with single shutter patient valve.
3. The bag should be made of silicone rubber.
4. It should have expiratory connector (for PEEP valve attachment): 30mm male (ISO).
5. It should have hand strap ensures a good grip, which helps to reduce fatigue during manual ventilation.
6. It should have single shutter valve. It should have double swivel mount at mask connector and bladder enable free movement of hands without disrupting manual ventilation. This valve impacts each stroke and retains oxygen level within reservoir bag.
7. Volume of oxygen reservoir bag is approx. 1500ml.
8. Resuscitators can be autoclaved repeatedly at 134 degree C.
9. There should be inlet for oxygen.

It should be USFDA/ EU CE/ BIS certified.



Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

डा. अनिल कुमार वर्मा  
अध्यक्ष  
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कानपुर

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

डा. ओ.ए.  
Assoc. Prof.  
Dept. of Emergency M.  
SGPGIMS, Lucknow



**Ambu Bag Neonate****Specification:**

1. Rao's Silicon Resuscitator Weight: upto 7 Kg
2. Ventilation Bag volume 240 ml
3. Reservoir bag volume 600 ml
4. There should be inlet for oxygen.

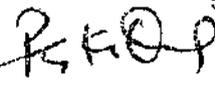
Mask Size : 0 A (Circular Pedia Mask)

It should be USFDA/ EU CE/ BIS certified.

  
 Dr. Jitendra Singh Chahar,  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 Dr. P. Sanjeev  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

  
 डा० अनिल कुमार शर्मा  
 आचार्य  
 एनेस्थीसियोलॉजी, क्रिटिकल केयर  
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 जी.एस.जी.एम. मेडिकल कॉलेज  
 कानपुर

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## Ambu Bag Paediatric

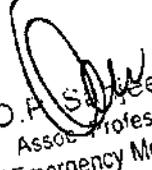
### Specification:

1. Rao's Silicon Child Resuscitator Weight: Upto 7 Kg to 20 Kg
2. Ventilation Bag Volume: 500 ml
3. Reservoir Bag Volume: 2600 ml
4. There should be inlet for oxygen.

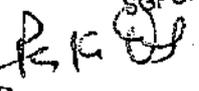
Mask Size: 0A (Circular Pedia Mask)

It should be USFDA/ EU CE/ BIS certified.

  
 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 Dr. O.P. Saha  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

  
 डा० अनिल कुमार वर्मा  
 आचार्य  
 एनेस्थीसियोलॉजी, क्रिटिकल केयर  
 एवं पैन मेडिसिन  
 जी.एस.पी.एम. मेडिकल कॉलेज  
 लखनऊ

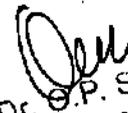
  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

### Basic Infusion Pump (Syringe)

Sr. No.	Technical Specifications
1	The syringe pump should be programmable, user friendly, should have battery backup and a comprehensive alarm system.
2	Flow rate range should be 0.1 - 1800 ml/h in 0.1 ml/h with accuracy +/- 2%.
3	Syringe Pump should detect the syringe size automatically and should be compatible to all syringe sizes from 2 ml, 5 ml, 10 ml, 20 ml, 30 ml, 50ml
4	Concentration and rate calculation on the basis of doses(mg/kg/h)xBody weight (kg)XSolution volume(ml)/dosage(mg).
5	Syringe Pump should have Automatic and manual bolus with pre-selectable volume.
6	Bolus rate should be upto 800 ml/hr.
7	Standby should be possible.
8	Pumps should have drug library and display drug name.
9	Infusion volume range from 0.1 to 9999.9ml, step by 0.1ml.
10	Occlusion Pressure settings should be adjustable in 9 levels from about 26 kPa - 130 kPa.
12	Syringe Pump should have State of the art technology Lithium-Ion battery with battery operating time of 7 hrs.
13	Flow accuracy typically +/-2%.
14	Pump should be ingress protected grade 2.
15	Syringe Pump should have colour display which can be easily read.
16	Screen size should be 2.4 inch or more.
17	. Alarm signals: - Pump should have optical and acoustic signaling with on screen help text of alarm and alarm cause Pre-Alarms: - Battery, time, volume, KVO Alarms: - Battery, volume, time, pressure in system is too high, KVO ended,
18	Control of the infusion pump in accordance with the standards and safety requirements according to IEC 60601-1 - Software update via interface of the pump - Keylock (Menu-button) easily accessible with one key press
19	Power Supply: 100-240 V, 50-60 Hz
20	Pump should be US-FDA/EU-CE /BIS with CML number
21	The quoted model should be CDSCO approved for Manufacturer or Importer.
22	Weight of the pump should be 2 kg or less

  
 डॉ० अनिल कुमार वर्मा  
 अध्यक्ष  
 एम्बुलेंस सेवा, दिल्ली  
 का पत्र बखीर  
 जी.एस.जी.एम. अस्पताल, कलकत्ता  
 कानपुर

  
 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 Dr. P.P.S.  
 Assoc

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## INFUSION PUMP (SYRINGE) - HIGH END

Sl. No.	Specification - INFUSION Pump (Syringe) HIGH END
1	Flow rate range should be 0.1ml/hr to 1200 ml/h with accuracy of $\pm 1\%$ on mechanism.
2	Should work on the following syringe capacities 5, 10, 20, 30/35, 50/60 CC
3	Infusion modes to be present ml/hr mode, Dose mode, Volume / time: 0.1 - 99.9 mL; 00h01 - 96h00.
4	Should have the following Dose rate mode units: ng/h, ng/kg/min, ng/kg/h, microg/min, microg/h, microg/kg/min, microg/kg/h, mg/min, mg/h, mg/24h, mg/kg/min, mg/kg/h, mg/kg/24h, mg/m <sup>2</sup> /h, mg/m <sup>2</sup> /24h, g/h, g/kg/min, g/kg/h, g/kg/24h, mmol/h, mmol/kg/h, mmol/kg/24h, mU/min, mU/kg/min, mU/kg/h, U/min, U/h, U/kg/min, U/kg/h, kcal/h, kcal/24h, kcal/kg/h, mEq/min, mEq/h, mEq/kg/min, mEq/kg/h.
5	Should have drug library of more than 2000 drugs categorized in user defined 15 or more categories with facility to set all infusion parameters like soft limit, hard limit, bolus dose etc.
6	Should have Soft and Hard limit for max. or min. Flow/Dosage rate that cannot be exceeded and is rejected by the pump.
7	Should have facility to upload drug library simultaneously through a single interface in the station with up to 4 infusion pumps in a system with an external hardware
8	Should have direct bolus option with flow rate 50ml/hr to 1200ml/hr with increment of 50ml/hr along with programable bolus with settable dose or volume/time
9	Should have settable KVO option ranging from 0.1 to 5ml/hr with feature to keep it off
10	3 modes Priming is required (Mandatory, not mandatory, or advised) with max flow rate: 1200 ml/hr.
11	Should have induction dose facility with setting of Dose / time: 0.1 - 99.9 units / 1 second - 24 hours rate auto-calculation
12	Night mode programmed manually or automatically in a variable time range is must to decrease the brightness of the screen.
13	Fast start option is mandatory with pause option programmable from 1min to 24hrs
14	Variable and 3 pre-set levels pressure mode is must. Range from 50 to 900 mmHg. (25 mmHg increment from 50 to 250 mmHg / 50 mmHg increment from 250 to 900 mmHg). Can be enables / disabled and adjusted with facility to display realtime inline pressure in both digital and analog form.
15	The Dynamic Pressure System with maximum and minimum threshold setting is mandatory.
16	Anti-bolus system is required
17	On Screen Graphical display of the following history "Volume / dose infused, pressure, flow rate" must be present.
18	There should be facility of dedicated button for Increasing and decreasing the flow rate
19	Should save 1500 data log events in real time and should have graphical history of Volume/ dose infused, pressure and flow rate
20	The device should have Syringe barrel clasp check, plunger head detection, anti-siphon system check, flange detection.

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

Dr. O.P. Sanjeev  
Assoc. Professor  
Dept. of Emergency Medicine  
S.G.P.G.I.M.S., Lucknow

डा० जयदेव कुमार वर्मा  
ज्योतिष  
एनेस्थीसियोलॉजी, क्लिनिकल केंद्र  
एवं पैन मेडिसिन  
जी.एस.बी.एस. मेडिकल कॉलेज  
कासपुर

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

21	The device should have the following alarm: a. Occlusion pressure pre-alarm b. occlusion pressure alarm c. patient line disconnection d. end of infusion pre-alarm e. end of infusion alarm f. volume limit pre-alarm g. volume limit alarm h. keypad manual locking or keypadlock i. hard and soft flow rate limits j. start infusion at pause end k. Disengaged driving mechanism alarm l. plunger disengaged alarm m. low battery pre-alarm n. discharged battery alarm o. battery capacity display in hours and minutes. p. unconfirmed programming q. technical malfunction alarm (auto-test, rotation) r. drive system advance check s. watchdog check, communication connection failure t. plug-head disengagement u. auto-lock/lock code (on Keypad) v. preventive maintenance.
22	The device should have push guard for syringe protection!
23	Should have LCD display of size equal or more than 66 mm x 33 mm
24	Should have Swinglock clamp for versatile clamp and horizontal clamp that allows the fixation on a rail or on a pole
25	Should have Li-ion Smart battery, remaining battery life and battery charge level available on the display. Battery Life (when fully charged): > 13 h at 5 mL/h.
26	The device should have RS232 Communication port with HL7 compatibility.
27	Should have option of self stackability of min 3 pumps
28	The device should have facility of Docking station to fit in 4 or 6 pump
29	Docking station should be able to communicate to HIS and should be HL7 compliant
The device should Compliance with the following	
a	Electromagnetic compatibility EMC - IEC 60601-1-2, IEC 60601-2-24
b	Medical Device Directive - CE 0123 marking in compliance with the Concl Directive 93/42/EEC
c	Electrical Compliance - Protection against leakage current: Defibrillation-proof type CF and Protection against electric shocks: class II in accordance with IEC 60601-1
d	Alarm system - IEC 60601-1-8
e	Usability Engineering - IEC 60601-1-6 and IEC 62366
f	The device should be USFDA / European CE certified

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

डॉ. जितेंद्र कुमार वर्मा  
अध्यापक  
एनेस्थीसियोलॉजी, क्रिटिकल केयर  
एवं एम मेडिसिन  
जी.एस.पी.एस. मेडिकल कॉलेज  
लखनऊ

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Dr. O.P. Sanjeev  
Assoc. Prof.  
Dept. of Emergency Med.  
SGPGIMS, Lucknow

## Advanced Infusion Pump with TCI Facility

(A)	Technical Specification
1.	Ergonomically designed mechanism to stack 4 pumps to maximum 24 that has the capability to supply power with only one power cable, transfer data i.e. with communication capabilities.
2.	Fixation of the pumps by simply click in mechanism into the system.
3.	All pumps can be removed individually without interrupting the functioning of remaining pumps.
4.	Integrated workstation for both syringe and volumetric pump
5.	Optional data module per patient bed for PDMS or HIS systems with following Interface connection <ul style="list-style-type: none"> <li>• RS 232</li> <li>• USB Master &amp; Slave</li> <li>• Ethernet RJ 45</li> <li>• Wireless LAN</li> </ul>
6.	Weight Equal or less than 1.4 kg.
7.	Flow rate range 0.01 - 999.9 ml/h <ul style="list-style-type: none"> <li>• 0.01- 99.99 ml/h in increments of 0.01 ml/h</li> <li>• 100.0 - 999.9 ml/h in increments of 0.1 ml/h</li> </ul>
8.	Syringe sizes :- 2/3; 5; 10; 20; 30; 50/50 ml
9.	Online rate modification without delivery interruption
10.	Accuracy of set delivery rate equal or less than +/- 2 % including recommended syringe.
11.	Bolus application Delivery rate 1 - 1,800 ml/h; max. Bolus Volume 99.99 ml
12.	Bolus on demand with manual selection
13.	Bolus with volume/dose pre-selection
14.	Bolus delivery with time pre-selection (1 min - 24 h)
15.	Should be Automated syringe change for optimal start up characteristics
16.	Standardized User Interface for all Syringe & volumetric infusion pumps.

Dr. Jitendra Singh Chahar

Assistant Professor

Department of Critical Care Medicine

S.G.P.G.I.M.S., Lucknow

डा० अजय कुमार वर्मा  
अध्यक्ष  
एनेस्थीसियोलॉजी, डी.एम.  
ए.पी.एस. सिस्टम  
एन.ए.ए.ए. सिस्टम  
एन.ए.ए.ए. सिस्टम

Prof. P.K. Das  
Professor & Head

Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Dr. O.P. Sarin  
Assoc. Pr.  
Dept. of Emergency  
SGPGIMS, L.

17.	Dose calculation: Automatic calculation of the delivery rate based on dose entries in mg, µg, IE or mmol, weight- and/or time related
18.	Pole clamp must be rotated to connect either in IV pole or in bed handle.
19.	Different color LED display for operational indication
20.	During infusion, following parameters must be displayed for better therapy control <ul style="list-style-type: none"> <li>• Infusion Rate</li> <li>• Occlusion Pressure limit setting</li> <li>• Current occlusion pressure</li> <li>• Battery level</li> <li>• Mains mode</li> <li>• Infused volume</li> <li>• Infusion therapy time</li> <li>• Infusion status</li> </ul>
(B)	<b>Special Features:-</b>
1.	User individual configuration or deactivation of KVO rates possible with following setting <ul style="list-style-type: none"> <li>• Rate <math>\geq 10</math> ml/h: KVO rate 3 ml/h</li> <li>• Rate <math>&lt; 10</math> ml/h: KVO rate 1 ml/h</li> <li>• Rate <math>&lt; 1</math> ml/h: KVO rate = set rate</li> </ul>
2.	Drug library :- 1500 drugs including all parameters with category Up to 15 user preference and with dosage limits to reduce medication errors
4.	Key pad must be back lit with light brightness control
5.	Key pad structure must be identical to Infusion pump
6.	Parameter fonts in pump display may changed into small & Large for better visibility.
7.	Lock-key for drive to avoid accidental removal of syringes by unauthorized person.
8.	Pump must store last 1000 events on following aspects <ul style="list-style-type: none"> <li>• functionality of pumps</li> <li>• Operational &amp; technical alarm of pumps</li> <li>• Keypad operation</li> </ul>
(C)	<b>Safety Features:-</b>
1.	Integrated piston brake within syringe drive to prevent free flow during syringe change.
2.	Occlusion alarm pressure limits must be Adjustable in 9 steps (0.1-1.2 bar or 75 - 900 mmHg)

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

डा० अजय कुमार वर्मा  
असिस्टेंट प्रोफेसर  
एनेस्थीसियोलॉजी, क्रिटिकल केयर  
एवं एम मेडिसिन  
जी.एस.डी.एम. मेडिकल कॉलेज  
कानपुर

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Dr. P.K. Das  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

3.	Occlusion Pressure setting must be displayed in in mmHg
6.	Medication error prevention through dose limits referring to selected drug
7.	Computer assisted software for configuring 700 plus drugs for all safety related parameters setting.
8.	International Classification according to:- <ul style="list-style-type: none"> <li>• IEC/EN60601-1 - type, IEC/EN 60601-2-24,, EN 55011</li> <li>• FDA/CF defibrillator proof protective class II</li> <li>• 93/42/EWG - Class II b</li> <li>• Moisture protection IP22 (drip protected for horizontal usage)</li> </ul>
(D)	<b>Power Supply:</b>
1.	Mains adaptor with rated voltage from 100...240 V AC, 50/60 Hz for stand alone - operation
2.	External low voltage rating must be 11 ... 15 V; via external power supply 12 V
3.	Rechargeable NiMH battery pack with operating time approx over 12 hrs.
4.	Battery change must be quick and easy without using screw-driver and not opening pump.
5.	Battery with Battery capacity display in h and min
6.	Battery must be common for syringe pump as well as infusion pump.
(E)	<b>Upgradable Features:-</b>
1.	Stacking pumps together to save space in ICU / OT min 4 to max. 24 pumps. with single power cord & additional battery.
2.	Plug & Play connection Monitoring Pump working condition, alarm condition with central alarm display
3.	Single power adaptor facility to power 3 pumps.
4.	Computer aided software to collect 2000 plus events to understand <ul style="list-style-type: none"> <li>• Functionality of pumps</li> <li>• Operational alarm of pumps</li> <li>• Technical Alarm of pumps</li> <li>• Keypad operation</li> </ul>
5.	Connecting & Monitoring pumps (With Station) to hospital information systems / computer network via. <ul style="list-style-type: none"> <li>• RS232</li> <li>• Ethernet</li> <li>• Wireless LAN,</li> <li>• USB</li> </ul>
6.	Upgrade of pumps to special therapy like PCA therapy mode

Dr. Jitendra Singh Chahar

Assistant Professor

Department of Critical Care Medicine

S.G.P.G.I.M.S., Lucknow

डा० अनिल कुमार वर्मा  
अध्यक्ष

एनेस्थीसियोलॉजी, क्रिटिकल केयर  
एंड डेप थैरेपिज  
की एम.डी.एम. केन्द्र, एनेस्थीसियोलॉजी  
की एम.डी.एम. केन्द्र, एनेस्थीसियोलॉजी

Prof. P.K. Das

Professor & Head

Dept. of Anaesthesiology & CCM

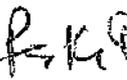
Dr. RMLIMS, Lucknow

Dr. J.P. Sanjeev  
Assoc. Professor  
Emergency Medicine  
Lucknow

7.	<b>Seamless Documentation-</b> Infusion pumps introduce an internal data buffer for data caching when no network connection is available.
8.	<b>Should be upgradable to Information density-</b> Unique combination of the colour graph and further TCI relevant data, such as titrating the target, drug name and remaining volume in the syringe
(F)	<b>TCI feature should be inbuilt:</b> <ol style="list-style-type: none"> <li>1. 3rd generation of TCI</li> <li>2. Pump should have all therapies in clinical routine including TIVA/TCI.</li> <li>3. Pump provides a variety of TCI algorithms (Propofol: Schnider, Marsh; Remifentanyl: Minto) as well as user profiles (plasma targeting/effect site targeting)</li> <li>4. All important information visible on one screen</li> <li>5. Enhanced user control with the possibility of delivering an extra bolus during TCI</li> </ol>
(G)	<b>Certification:</b> <ol style="list-style-type: none"> <li>1. US FDA and EU CE</li> <li>2. IEC/EN60601-1 - type CF defibrillator proof protective class II</li> <li>3. 93/42/EWG - Class II b</li> <li>4. EMC EN60601-1-2</li> <li>5. Moisture protection IP22 or better</li> </ol>

  
**Dr. Jitendra Singh Chahar**  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 डॉ० प्रकाश कुमार वर्मा  
 प्राध्यापक  
 एनेस्थीसियोलॉजी, क्रिटिकल केयर  
 एवं एम मेडिसिन  
 जी.एस.जी.एम. मेडिकल कॉलेज  
 कानपुर

  
**Prof. F.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
**Dr. O.P. Sanjeev**  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

## Ventilator (MRI Compatible Transport type)

(For use in MRI Suit of 1.5/3 Tesla)

1. The ventilator should be Microprocessor based Independent of Medical Air.
2. Ventilator should be designed for the ventilating Adult, Paediatric & Neonatal in MRI environment.
3. The ventilator should work with 1.5 Tesla and 3.0 Tesla static magnetic field scanners.
4. The Ventilator should have a handle with quick-lock mounting option that allows the user to remove and re-fix the ventilator from the trolley and attach it to the patient's bed.
5. Ventilator should have facility to remain close to the patient even during MRI scans.
6. System should have Indications for safety MRI zone, magnetic field navigator with standalone alarms mirrored on the device.
7. The machine should continuously measure the background magnetic levels, even when the ventilator is switched off.
8. The system must be designed to withstand a static magnetic field of 50 mT or above.
9. Should have auto lock facility for trolley when handles are released to prevent it from rolling accidentally towards the MRI scanner.
10. The machine should have integrated turbine/blower able to generate a peak flow of 240l/min or more.
11. Machine should have facility to ventilate Both Invasive & Non-invasive with leak compensation.
12. Should be based on reliable flow measuring technology.
13. Should have inbuilt O<sub>2</sub> sensors and It should cover under warranty.
14. Ventilator should have min 8" inch TFT colour touch screen with/without rotatory encoder
15. The ventilator should have following Modes of ventilation:
  - a) Pressure control ventilation.
  - b) Dual control modes like PRVC/APV/Auto flow etc.
  - c) SIMV PCV with pressure support ventilation.
  - d) SIMV VC with pressure support ventilation.
  - e) PSV/CPAP-PS.
  - f) NIV (PC), NIV (PS).
  - g) Should have CPR mode.
  - h) Machine should have Advanced close loop control mode as a standard.
16. Ventilator should have integrated pneumatic nebulizer which should be synchronized with inspiratory cycle.
17. The ventilator should have the following Setting Parameter
  - a) Tidal Volume: 2-1500ml
  - b) BR: 1-80b/min
  - c) I:E Ratio: 1:4 to 4:1
  - d) P<sub>insp</sub>: 5-60cmH<sub>2</sub>O
  - e) PEEP/CPAP (cmH<sub>2</sub>O) 0 to 35
  - f) Trigger, flow (l/min) 0.5 to 20.0
  - g) P Support (cmH<sub>2</sub>O) 0 to 60
18. The machine should have battery backup of minimum 2hrs.
19. Ventilator should have quick start based on IBW or Height.
20. Should display vital monitoring parameters including Exhaled tidal volume, Breath rate, I:E ratio, FiO<sub>2</sub>, Peak Pressure, Mean Airway Pressure etc.
21. The machine should have 360° visual alarm with audible High, Medium, Low Priority Alarm facility.
22. The machine should have graphical display of Pressure, Volume and Flow as standard.

  
 Dr. Jitendra Singh Chahar,  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 डा० अनिल कुमार वर्मा  
 एम.बी.बी.एस., फिजिशियन  
 एम.के.एस.के.एस.के.एस.  
 एम.के.एस.के.एस.के.एस.  
 एम.के.एस.के.एस.के.एस.

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Dr. P. Sanjay  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGP.GIMS, Lucknow

23. Source input pressure of oxygen: 41 to 60 psi. 65
24. The ventilator should represent virtual lung which shows changes in lung mechanics including spontaneous activity of the patient.
25. Should have graphical trends for maximum of 72 hours.
26. Should have display facility of Loops: Pressure/Volume, Pressure/Flow, Volume/Flow.
27. The trolley should be from the same manufacturer.
28. Certification:  
A) US FDA / European CE from notified body.
29. Scope of supply:  
a. Breathing circuit suitable for MRI – 10 nos.  
b. Flow sensors with each ventilator – 10 nos.  
c. Test lung – 1 no.  
d. Oxygen hose – 1no.



Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

डा० अजीत कुमार वर्मा  
अध्यापक  
एनेस्थीसियोलॉजी, क्रिटिकल केयर  
एवं गिन मेडिसिन  
जी.एस.पी.एम. मेडिकल कालेज  
कानपुर



Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow



Dr. O.R. Sanjeev  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGMS, Lucknow

## Jet Nebulizer

1. The compressed air based jet nebulization system should be suitable for use for adult/Pedia and applicable for spontaneously breathing patients.
2. The system should be use for treating the upper and lower airways, colds, asthma and respiratory diseases for short inhalation time.
3. Performance Parameters for the Drug chamber should meet:
  - a) Flow Rate: 6-10 L/min
  - b) MMAD (Mass Median Aerodynamic Diameter):  $< 10\mu\text{m}$
4. Size should be Compact and Weight less than 2 kg.
5. Maximum Sound Level should be  $\leq 90$  dB
6. Device should be US FDA or European CE from 4 digit notified body.
7. Scope of supply:
  - a) Compressor Unit- 1 no.
  - b) Power Supply unit with Cable- 1 no.
  - c) Drug Chamber- 5 nos.
  - d) Mask- 15 nos. of different size.
  - e) Connecting Tubing- 5 nos.

  
 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 Dr. O.P. Sanjeev  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGP GIMS, Lucknow

  
 डॉ० प्रमोद कुमार दास  
 प्राध्यापक  
 एनेस्थीसियोलॉजी, क्लिनिकल केमिस्ट्री  
 एवं रीन मेडिसिन  
 जी.एस.पी.एम. मेडिकल कॉलेज  
 लखनपुर

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

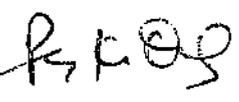
## Ultrasonic Nebulizer

1. The Ultrasonic Nebulizer should nebulize drugs for administration via face mask.
2. Technical specifications:
  - a) Ultrasonic crystal operating frequency should be more than 1.6 MHz
  - b) The Medication Cup Capacity should be at least 100 ml
  - c) The Water Tank Capacity should not be more than 300 ml.
  - d) The Nebulization Rate should be adjustable from 0 to 5 ml per minute  $\pm$  10%.
  - e) Should have a residual volume of less than 2ml.
  - f) The Noise Level should be less than 50 dB
  - g) The particle size should have an MMAD (Mean Mass Aerodynamic Diameter)  $<$  5 $\mu$ m
3. Should be capable of continuous operation and the time of operations should be adjustable between 5 and 30 minutes
4. Flow range of air volume should adjustable from 5 to at least 20 LPM.
5. Power consumption should be less than 100 W
6. Should have weight less than 3 Kg.
7. Scope of supply:
  - a) US Nebulizing Unit- 1no.
  - b) Medication cup- 10nos.
  - c) Inhalation hose- 10nos.
  - d) Mouthpiece- 15 nos of different sizes.
  - e) Power cord-1 no.
  - f) User manual- 1 no.
8. Device should be US FDA or European CE from 4 digit notified body.

  
 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 डा० अनिल कुमार वर्मा  
 आचार्य  
 एनेस्थीसियोलॉजी, क्रिटिकल केयर  
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 जी.एस.पी.एस. मेडिकल कॉलेज  
 वाराणसी

  
 Dr. O.P. Sanjeev  
 Assoc. Professor  
 Dept. of Emergency Med.  
 SGPMS, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## Vibrating Mesh Nebulizer

1. The microprocessor-controlled vibrating mesh aerosol drug delivery / Nebulization system should be suitable for use from adults to neonates, compatible with any respirator/ventilators and applicable for spontaneously breathing patients.
2. The system should include a controller unit with a built-in battery backup, an interconnecting cable for the aerosol drug chamber, a power supply unit, T-pieces for adult, pediatric, and neonatal ventilator connections, and a spacer unit with a mask for spontaneously breathing patients.
3. Performance Parameters for the Drug chamber should meet:
  - a) **Nebulization Rate:** 0.15 ml/min - 0.90 ml/min
  - b) **MMAD (Mass Median Aerodynamic Diameter):**  $< 5\mu\text{m}$
  - c) **Residual Volume:**  $\leq 0.3\text{ml}$
  - d) **Medication Cup Capacity:** 10 ml (max)
  - e) **Maximum Temperature (Above Ambient in Medication Cup):**  $< 30^\circ\text{C}$
  - f) **Vibration Frequency:**  $130\text{ kHz} \pm 10\%$
4. Controller Unit should meet the below specifications:
  - a) **Modes :** Continuous -45 min & Patient Breath trigger mode -90 min
  - b) **Size should be Compact**
  - c) **Weight:** less than 100 g
  - d) **Operating Frequency:**  $130\text{ kHz} \pm 10\%$
  - e) **Battery Model:** Built-in Lithium Battery for the back-up up-to min 45 min
5. Should have two nebulization mode:
  - a) Continuous Mode
  - b) Nebulization Mode with induction (trigger mode)
6. Maximum Sound Level should be  $\leq 50\text{ dB}$
7. Power Consumption should be  $< 4.0\text{ W}$
8. Particle Size and Aerosol Output Measured in accordance with EN ISO 27427:2023, Annex C and D using a breathing simulator and multistage cascade impactor.

Dr. Jitendra Singh Chahar,  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

डा० जितेंद्र कुमार चर्मा  
असिस्टेंट प्रोफेसर  
एनेस्थीसियोलॉजी, सिविलिकल सेंटर  
इस वेंस मेडिसिन  
जी.एस.पी.एम. मेडिकल कॉलेज  
कानपुर

Dr. P.K. Das  
Assoc. Prof.  
Dept. of Emergency  
SGPGIMS, Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**9. Certifications:**

- Ingress Protection (IEC 60529):IP22
- US FDA or European CE from 4 digit notified body.

**10. Scope of supply:**

- Controller Unit with Continuous & Patient Trigger Mode with built-in Battery backup- 1no.
- Power Supply unit with Cable- 1no.
- USB Cable for Drug Chamber- 1no.
- Patient Sensor- 1no.
- Drug Chamber- 5nos.
- T-Pieces - 22mm, 15 mm, 12 mm - 1 no each.
- Spacer with Mask & Oxygen Tube- 1 no.

डा० अरवि कुमार वर्मा  
अचार्य  
एनेस्थीसियोलॉजी, क्रिटिकल केयर  
एवं पैन मेडिसिन  
जी.एस.डी.एम. मेडिकल कारोबार  
काठपुर

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

Dr. O.P. Sanjeev  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## High End Portable Ultrasound with ECHO facility

A state of art fully digital, compact portable Color Doppler Ultrasound machine with following technical features:

1. It should be suitable for abdominal, small parts, cardiac, Nerve, TCD and vascular applications in adults, pediatric and neonatal patient.
2. The equipment must be capable of operating in B-mode, Anatomical M-mode, M-color, CPD, Pulse Wave, PW-TDI & CW
3. It must support pin less transducer technology with Convex Array, Micro Convex Array, Linear array, Phased Array for Adult, Pediatric and Neonatal and TEE formats. The transducer should be easy to clean and disinfect.
4. The system should have an integrated high resolution TFT / LCD of 15 inches. (flicker free images)
5. The system weight should be less than 7 kg.
6. It should be mounted on a sleek OEM Trolley which can be easily added adjusted from vertical to horizontal or vice versa.
7. The system should have touch interface for easy cleaning and disinfecting while using the system in ICU/OT/Intervention/Surgery or any department to avoid cross contamination.
8. System should have frame rate of 950 frames per second or more
9. The system should have i7 processor or any latest operating system which is not prone to failure, hang up, data corruption while in networking environment.
10. The system should have Contrast harmonic imaging (CHI), Speckle reduction imaging (SRI), Time Gain Compensation (TGC), Auto Optimization, different grey map technology for better image quality in B-Mode.
11. The system should have robust data security including an initial security set-up wizard that allows user to choose their security level for data protection.
12. Central line marker facility on probe as well as on monitor screen should be available for aiding during procedural guidance.

डा० अमित कुमार वर्मा  
 आचार्य  
 एनेस्थीसियोलॉजी, क्रिटिकल केयर  
 एवं रेसुसिटेशन  
 डी.एस.जी.एम. मेडिकल कॉलेज  
 लखनऊ

Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

Dr. O.P. Sanjeev  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

13. The system shall have ability to function 100-240VAC 50-60 Hz or inbuilt power battery with the same degree of functionality. Inbuilt battery backup should be at least one hour without external UPS to handle critical and emergency situations.
14. The system shall go from the off status to active scanning in less than 60 seconds to address any emergency or critical care need for intervention and procedural use.
15. The system should be sturdy and protected by bang proof casing/ railing for safe shifting in busy hospital environment.
16. System should reduce the spectral noise, improves contrast resolution, and provide ease of diagnosis of different application with auto smart AI options for ease of use by multiple end users (please specify the technology)
17. System should have advance auto needle visualization tool to eliminate the "hidden needle" in steep angle interventional procedure of vascular access, biopsy, small part, musculoskeletal and nerve examination (please specify the technology)
18. The system memory/ hard disk should be at least 128 GB or more to store images, clips, or combination of the same.
19. The system should have on board educational video tutorial for learning of end user with inbuilt Manual.
20. The system should have advance interface Trapezoidal, Panoramic, Dedicated calculation package along with auto calculations for EF, VTI, IVC and B-lines of Lung and Nerve Imaging.
21. The system shall have display depth of 35cm or more and minimum of 1cm.
22. The system should have a color compare mode for real time side by side comparison of structure in 2D and color mode, and with needle enhancement.
23. The system should have intensity power doppler function, zoom, post process for image enhancement, measurement, and image quality improvement.
24. The system shall be DICOM3 compliant and allow the saving DICOM configuration via USB/DICOM port for ease of transfer or store.
25. The three port system inbuilt transducer configuration should be provided along with the equipment:
  - o Linear transducer (4 to 12 MHz) for arterial, venous, musculoskeletal, lung and superficial examination
  - o Convex transducer (1 to 5 MHz) for abdominal, MSK, spine, Gyn/OB, and intervention imaging

डा. अनिल कुमार वर्मा  
जानकरी  
एनेस्थीसियोलॉजी, इन्सिडेंटल केयर  
एवं डेन मेडिसिन  
जी.एस.पी.एम. मेडिकल कॉलेज  
लखनऊ

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

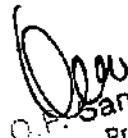
Dr. O. Ranjiv  
Assoc. Professor  
Dept. of Emergency Medicine  
S.G.P.G.I.M.S., Lucknow

26. The unit should be USFDA approved.

**Scope of supply:**

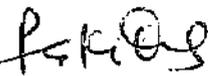
- Ultrasound machine – 1
- OEM portable trolley – 1
- Linear probe – 1 (small or large)
- Convex probe – 1
- Phased Array Probe (ECHO Probe) – 1
- Service book with column for date and time for malfunction intimation, visit of service personnel, rectification of malfunction.
- Sterile probe covers – 50

  
 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 Dr. O.P. Sanjeev  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

  
 डॉ० प्रो० पी०के० दास  
 प्राध्यापक  
 एनेस्थीसियोलॉजी, सिटीयल केयर  
 एवं क्रि० चिकित्सा  
 जी.एस.पी.एस., मेडिकल कॉलेज  
 लखनऊ

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow



### Optional Probes for High End Portable Ultrasound :

- Linear probe small footprint/large footprint - 3,50,000
- Phased array transducer/ ECHO probe 1 to 4MHz (+/- 1 MHz) for cardiac Examination, Transcranial doppler- 4,00,000
- linear array hockey stick transducer 2 to 16 MHz (+/- 1 MHz) - 5,00,000
- curved array transvaginal transducer 4 to 10 MHz (+/- 1 MHz) OB/GYN - 2,50,000
- Pediatric Cardiac Probe 2 - 8 MHz (+/-1)- 4,00,000
- Neonatal Cardiac Probe 2 - 12 MHz (+/-1) Broadband- 5,00,000
- Micro Convex Probe 2 - 11 MHz (+/-1) Single Crystal- 5,00,000
- Adult 2D TEE probe 2 - 8 MHz (+/-1)- 17,00,000



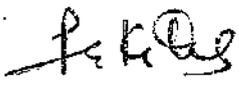
Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow



डा० जितेंद्र कुमार चहार्  
अध्यापक  
एनेस्थीसियोलॉजी, क्लिनिकल कैमर  
एवं पैल मेडिसिन  
जी.एस.जी.एम. मेडिकल कॉलेज  
कानपुर



Dr. P.K. Das  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow



Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**BASIC PORTABLE ULTRASOUND**

Intended use: OTs/Emergency ward/ICU

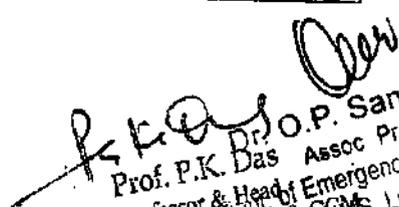
**A. Specification of Base Unit**

A state of art fully digital, compact Colour Doppler Ultrasound machine is required with following technical features:

1	Unit should be able to give very high image quality with advance technologies like compound imaging for better contrast resolution, tissue differentiation and edge detection.
2	The unit should be compact, lightweight and portable. Weight should not exceed 6 kg including the battery but excluding cart and accessories. Mention the exact weight of the equipment along with the battery.
3	Imaging modes of Real time 2D, M Mode, Colour Doppler, Power Doppler, Pulsed wave Doppler, Continuous wave Doppler must be available.
4	System must have fast start up to scanning in less than 60 seconds from off condition, for use in ICU and emergency condition.
5	System should support transducer technologies like phased array, convex, and linear and should be future upgradable to support TEE transducer.
6	The system should have a broadband architecture with an operating frequency of at least 1 to 15 MHz
7	Cine memory of at least 250 should be available on all operating modes.
8	The system should have a dynamic range of 165 decibels or more
9	The system should have maximum scanning depth of 30cm or more.
10	The system should provide minimum 6 generation digital callipers.
11	The system must have dedicated calculation packages for cardiac, vascular & Obs/Gyn measurements.
12	The system should have an integrated high resolution TFT/LCD of 12 inches or more with facility of tilt and swivel facility along with convenient grip.
13	Alphanumeric soft keys backlit and splash-proof resistant keypad with easy access scans controls, facility to sanitize the system keyboard to avoid cross contamination
14	System should possess 'Needle Visualization Software' to track the needle clearly at steep angles during procedural guidance with maintaining striking image quality of the target structures and the surrounding anatomy with simple On/Off functionary on both linear & curvilinear

  
Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.C. & J.S., Lucknow

  
डा० प्रकाश कुमार वर्मा  
अध्यक्ष  
एनेस्थीसियोलॉजी, इंटिग्रेटिव कैंसर  
एवं पैन मेडिसिन  
जी.एस.डी.एम. मेडिकल कॉलेज  
कानपुर

  
Prof. P.K. Bas  
Assoc Professor  
Department of Anaesthesiology & CCIM,  
Dr. RMLIMS, Lucknow

	transducers.
15	The system must have the ability to function by AC/DC or battery power with the same degree of functionality, the battery life (run time) shall be at least 60 minutes.
16	The system must have archive capability for storage & retrieval of images and clips. It should have at least 2 USB 3.0 slots, which allow for direct sharing of images (JPEG) and clips (AVI) to a PC.
17	The system must have in-built/external hard drive memory of at least 128 GB for sharing patient data & studies.
18	The system should be capable to supporting all DICOM functionality (Storage, Print, and work List), also shall be compatible to connect to PACS.
19	Detachable, imported, moulded, OEM Trolley/ cart to mount transducers and machine. The cart height should be hydraulically adjustable and work surface should be adaptable from horizontal to vertical.
20	Unit should function with 200-240V, 50Hz AC, 5-amp power outlets and power requirement to be specified.
21	When the machine is mounted on trolley, facility for connect three transducers simultaneously with easy selection of active transducer should be possible.
	The vendor should agree to provide any kind of future software updates at no additional cost for a period of 10 years from the date of installation. <b>Certifications:</b> 1. Should be US FDA approved by 4 digits notified body. 2. Instruments must be ISO certified and a copy should be enclosed. (The ISO Certificate must be issued by any organization accredited by the Bureau of Indian Standard or accredited by the international accrediting forum "IAF" (Certificate to be attached).
<b>Scope of supply:</b>	

S. No	Transducer	Functions	Number
1.	2-5 MHz (+/- 1 MHz) multi-frequency convex transducer	Abdominal	01
2.	6-13 MHz (+/- 2 MHz) multi-frequency Linear transducer,	vascular, nerve imaging	01
3.	Ultrasound machine		01

Dr. Jitendra Singh Chahar

Assistant Professor

Department of Critical Care Medicine

S.G.P.G.I.M.S., Lucknow

एन.एस.टी.एस. मेडिकल कॉलेज  
काशीपुर  
जी.एस.टी.एस. मेडिकल कॉलेज  
काशीपुर

Prof. P.K. Das

Professor & Head

Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

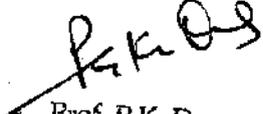
Dr. O.P. Sanjeev  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

4.	OEM trolley		
5.	Probe cover for safety from rodents		01 with each probe
6.	Sterile transparent probe covers		20

  
 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 Dr. O.P. Sanjeev  
 Assoc Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

  
 डा० अनिल कुमार दास  
 अध्यक्ष  
 एनेस्थीसियोलॉजी, क्रिटिकल केयर  
 एवं पेन मेडिसिन  
 जी.एस.टी.एस. मेडिकल कॉलेज  
 बानसपुर

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**Future up-gradations:**

- Linear probe small footprint/large footprint – 3,50,000
- Phased array transducer/ ECHO probe 1 to 4MHz (+/- 1 MHz) for cardiac Examination, Transcranial doppler– 4,00,000
- linear array hockey stick transducer 2 to 16 MHz (+/- 1 MHz) – 5,00,000
- curved array transvaginal transducer 4 to 10 MHz (+/- 1 MHz) OB/GYN – 2,50,000
- Pediatric Cardiac Probe 2 – 8 MHz (+/-1)– 4,00,000
- Neonatal Cardiac Probe 2 – 12 MHz (+/-1) Broadband– 5,00,000
- Micro Convex Probe 2 – 11 MHz (+/-1) Single Crystal– 5,00,000
- Adult 2D TEE probe 2 – 8 MHz (+/-1)– 17,00,000

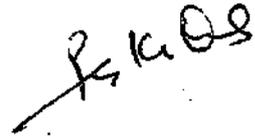


Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.C.P.G.I.M.S., Lucknow



Dr. Sangeev  
Assoc Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

डा० जितेंद्र चहार  
असिस्टंट प्रोफेसर  
एनेस्थीसियोलॉजी, इमिजिनेस क्लिनिक  
एवं डीम मेडिसिन  
जी एस सी एस. मेडिकल कॉलेज  
कानपुर



Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Wireless Handheld Ultrasound with Echocardiography

1. The device should be portable/Mobile preferably a handheld 'point of care' device/Pocket sized and Wireless, Bluetooth enabled, easily connected/ paired to any devices, and compatibility with both IOS and Android OS
2. The device should have 128 physical channel beamforming for better image quality
3. The device should be light weight, weighing less than 300 grams and battery operated should provide than 45 min backup for better mobile services within the hospital premises.
4. Device should be capable/allowing to display anatomy in real-time in black and white mode and color-coded Doppler for real time blood flow imaging.
5. Device should have the Button in the probe to control like Freeze or Store
6. Device should have Auto optimized in 2D mode for basic and Selectable focal zone marker.
7. Facility to see Image on bigger Screen up to 20cm wirelessly (both Portrait and Landscape modes)
8. System should function/allow to adjust gain depth in 2D, color modes on externally connected device
9. There should be facility for image control Selectable TGC control with 6 depth-dependent gain controls.
10. System should be capable of doing multifunctional applications such as Abdominal, Vascular, peripheral vascular, musculoskeletal (conventional and superficial), small organs, ophthalmic, pediatrics, neonatal cephalic, Procedural Guidance, fetal/obstetrics, gynecological, urology, thoracic/lung, cardiac, interventional guidance (includes free hand needle/catheter placement, fluid drainage, nerve block, vascular access and biopsy).
11. The field of view should be minimum 60 degrees with maximum depth of 24cm
12. Data should be generic format and in separate folders: jpg for still frames, Mp4 or loops, so that it can be easily transferred to other apps or another device.
13. The system should have mandatory free Application update through software IOS or any play store when they become available.

### Certifications:

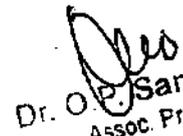
- System should be sturdy and resistant enough to withstand from hit and fall from one-meter height and IP67 Rating.

### Scope of supply:

- The system should be provided with phased array transducer probe: from 2 to 4 MHz with maximum depth of 24 cm and Linear Probe 3 - 12 Mhz with maximum depth of 8cm with 192 elements integrated on a single transducer with dual heads.
- Charger

  
 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 डॉ. अनिल कुमार दास  
 आचार्य  
 एनेस्थीसियोलॉजी, क्लिनिकल केंद्र  
 एम.के. मेडिकल  
 जी.एस.पी.एम. मेडिकल कॉलेज  
 कानपुर

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Dr. O.P. Sanjeev  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGP.GIMS, Lucknow



## Wireless Handheld Ultrasound with Convex and Linear Probe

1. The device should be portable/Mobile preferably a handheld 'point of care' device/Pocket sized and Wireless, Bluetooth enabled, easily connected/ paired to any devices, and compatibility with both IOS and Android OS
2. The device should have 128 physical channel beamforming for better image quality
3. The device should be light weight, weighing less than 300 grams and battery operated should provide than 45 min backup for better mobile services within the hospital premises.
4. Device should be capable/allowing to display anatomy in real-time in black and white mode and color-coded Doppler for real time blood flow imaging.
5. Device should have the Button in the probe to control like Preeze or Store
6. Device should have Auto optimized in 2D mode for basic and Selectable focal zone marker.
7. Facility to see image on bigger Screen up to 20cm wirelessly (both Portrait and Landscape modes)
8. System should function/allow to adjust gain depth in 2D, color modes on externally connected device
9. There should be facility for image control Selectable TGC control with 6 depth-dependent gain controls.
10. System should be capable of doing multifunctional applications such as Abdominal, Vascular, peripheral vascular, musculoskeletal (conventional and superficial), small organs, ophthalmic, pediatrics, neonatal cephalic, Procedural Guidance, fetal/obstetrics, gynecological, urology, thoracic/lung, cardiac, interventional guidance (includes free hand needle/catheter placement, fluid drainage, nerve block, vascular access and biopsy).
11. The field of view should be minimum 60 degrees with maximum depth of 24cm
12. Data should be generic format and in separate folders: jpg for still frames, Mp4 or loops, so that it can be easily transferred to other apps or another device.
13. The system should have mandatory free Application update through software IOS or any play store when they become available.

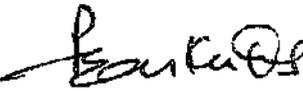
### Certifications:

- System should be sturdy and resistant enough to withstand from hit and fall from one-meter height and IP67 Rating.

### Scope of supply:

- The system should be provided with curved transducer probe: from 2 to 5 MHz with maximum depth of 24 cm with 128 elements and Linear Probe 3 - 12 Mhz with maximum depth of 8cm with 192 elements integrated on a single transducer with dual heads.
- Charger

  
Dr. Jitendra Singh Chahar,  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

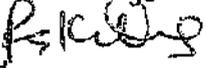
  
Dr. O.P. Sanje  
Assoc. Professor  
Dept. of Emergency Medicine  
S.G.P.G.I.M.S., Lucknow  
आचार्य  
एनेस्थीसियोलॉजी, सिविल कैंसर  
एवं पैन मेडिसिन  
जी.एस.पी.एम. मेडिकल कॉलेज  
कानपुर

## Defibrillator

S. No.	Technical Specification
1	Biphasic, Manual and AED with voice prompt, CPR Metronome, compact and light weight. CPR Metronome
2	Inbuilt CPR feedback
3	Energy selection 5J to 200J in steps.
4	Momentary energy selection access on front panel,
5	Should have adult and pediatric paddles integrated on same handle.
6	Monitor should display selected and delivered energy,
7	Charging time not more than 6 secs for 200J.
8	Should have battery backup for 50 discharges of 200J.
9	Should have ECG inputs through caddies or 5 lead cables.
10	Should have display for selected ECG input source
11	Should have inbuilt thermal recorder, 3 channel recorder.
12	Should supply 2 bottles of jelly, 12 roll of thermal paper.
13	Should supply three pairs of AED pads and the prices of AED Pads should be quoted separately in Financial Bid
14	Should work on 220VAC +/-10%, 50 Hz.
15	Screen Size 7" or More
16	Battery Backup: Monitoring Mode- min. 6hr Defib Mode: 210 Shocks of 200J Pacing Mode: 4.5 Hours. Or More
17	Instruments must be ISO 13485 certified, and a copy should be enclosed. (The ISO Certificate must be accredited by the international accrediting forum "IAF (Certificate to be attached)
18	Should be US FDA or European CE from 4 digits notified body.
19	The quoted model should be CDSCO approved for Manufacturer or Importer

  
 Dr. Jitendra Singh Chahar,  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 डा० प्रकाश कुमार दास  
 अध्यक्ष  
 एनेस्थीसियोलॉजी, क्लिनिकल केमिस्ट्री  
 एवं पैन मेनेजिमेंट  
 डी.एम.ए.एम., क्लिनिकल कालेज  
 लखनऊ

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Dr. O.P. Sanje  
 Assoc. Prof.  
 Dept. of Emergency  
 SGP.G.I.M.S., Lucknow

## Automatic CPR with Defibrillator

Intended use: Emergency resuscitation bay/ Cath lab/ ECPR for centers doing ECMO

1. The Device should be able to generate chest compression & provide consistent compression with no interruptions.
2. It should be easy to use in both Hospital and Emergency set up mainly during transportation.
3. It should have facility to provide chest compression to patient while carrying to staircase and even on 45° elevation.
4. It should be battery operated and have extremely simple user interface.
5. It should be able to achieve uniform load distribution by squeezing entire chest.
6. The Chest compression band should have an ability to do the high quality compression.
7. It should have small LCD back lit screen to show compression modes.
8. It should have ability to automatically size the patient by calculating size, shape and compliance of every patient.
9. The system should have capability to provide both 30:2 (30 compressions and 2-ventilation pause) and continuous compression just by pressing buttons.
10. The system should come with three batteries, 1 Battery Charger and three load distributing band.
11. The battery should be made Nickel metal hydride technology which enable to provide continuous compression of minimum 20 minutes in full charge.
12. The unit should come with Defibrillator for providing synchronized shock while the device is working.
13. The defibrillator should be rugged and should have easy to read three mode displays to be readable in any environment.
14. The Defibrillator should have facility for ECG Monitoring, defibrillation, rectilinear external pacing (transcutaneous) & recorder.
15. The Defibrillator should be rectilinear biphasic technology, having energy selection of 1 —200 joules.
16. The Defibrillator should have charging time of unit should be less than 7 Seconds of maximum energy.
17. The Defibrillator should have ability to measure chest compression rate and depth in real time and both visual and optional audible feedback will be provided.
18. It should have ability that all CPR data can be recorded and reviewed.
19. It should have ability to filter out CPR artifacts and allowing person to see organized rhythms without interrupting chest compression.
20. It should have voice and visual prompts.
21. The unit should have EtCO<sub>2</sub> and option of upgrade to SpO<sub>2</sub>, NIBP and 12 leads if required in future.
22. Installation will include customized wall mounting with battery storage for ease of charging and accessibility.

### Certifications:

1. The quoted Unit should be US-FDA/EU CE from four digit notified body.

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

डा० जितेंद्र कुमार वर्मा  
आचार्य  
सर्जनशास्त्र विभाग, कर्पूर कैंसर  
एवं हृदय विभाग  
जी.एस.पी.जी.एम. लखनऊ  
कानपुर

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Dr. P. K. Banjeev  
Assoc. Professor  
Dept. of Emergency Med.  
S.G.P.G.I.M.S., Lucknow

## Crash Cart

- Overall Dimensions : 900 x 580 x 1120 mm (L x W x H) along with 6 drawers having dimensions 530 x 420 x 60 mm for 1<sup>st</sup> to 3<sup>rd</sup> drawer & 530 x 420 x 125 mm for 4<sup>th</sup> to 6<sup>th</sup> drawer respectively having tolerance  $\pm 10\%$ .
- Should be made from durable mild steel & should be durable scratch resistant hard baked powder coat finish.
- Drawers should be of multicolor for easily identification of items placed inside.
- Should have key lock system to lock all drawers simultaneously .
- Should have full extension drawer's slides for easy access.
- Cart should have 5 Number Roo Tilt Bins mounted at eye level for placing medicines, ampoules, syringes etc.
- Cart should also have 6 Number Multicolor Hippo Bins mounted on cart.
- Should have side push handle for moving the cart from one place to another.
- Should be mounted on four 5" diagonally lockable heavy castors.
- Should be provided with four protective bumper to save any impact on the crash cart.
- Should have one slide-in-out writing board inbuilt in the cart structure.
- Should have stainless steel top with raised edges.
- Bio Waste Dustbin should be provided at one side of the trolley.
- Examination gloves holder slot to be provided at one side of the trolley.
- Oxygen Cylinder holder should be provided along with trolley.
- All the quality certificates must have date of issue before the date of NIB. After NIB date issued certificates will not be considered.
- Technical Compliance Sheet & Product Brochure to be submitted along with technical bid.

### Certifications:

- Manufacturer should have ISO 9001:2015 & ISO 13485:2016 from NABCB Accredited Certification Body. Copy to be provided along with bid.
- Manufacturer should also have ISO 50001:2018, Green Guard , BIFMA , ISO 14001:2015 , ISO 45001:2018. Copy to be provided along with bid.
- Manufacturer must have CDSCO License / Registration.
- Quoted model should be USFDA / European CE by Notified Body/ BIS as per medical class directive. Copy to be provided along with bid.

Dr. Jitendra Singh Chahar

Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

डा० अजय कुमार वर्मा  
काकाय  
एन.एस.टी.एम. मेडिकल कॉलेज  
कायपुर

Dr. O.P. Sanjeev  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## LMA SET: REUSABLE LARYNGEAL MASK WITH ANATOMICAL CURVE

1. Should be able to get reprocessed up to 40 times
2. Should have an anatomically correct curve for easy access and placement
3. Should have reinforced tip: to resist folding over during insertion and plug the upper oesophageal sphincter
4. It should be single molded (cuff and Tube) for better safety standards
5. Should have a pilot balloon to identify mask size and provide a precise tactile indication of the degree of inflation
6. The supraglottic airway (SGA) should be MR Safe and Phthalate Free
7. Should have convenient depth marks for monitoring the correct position
8. Should be available in all sizes from 1 to 6
9. Should be color coded packaged with directions of use
10. Should have a universal check valve

### Certifications:

- Should be US FDA/EUCE

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

डा० जितेंद्र कुमार चर्मा  
आचार्य  
एनेस्थीसियोलॉजी, मेडिकल सेक्टर  
एन.एस.एस. कॉलेज  
कानपुर

Dr. C.P. Saheev  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow.

## Patient Controlled Analgesia Pump (PCA)

- Should be ambulatory and should get power from disposable batteries.
- Ambulatory pump with delivery modes such as Continuous, Clinician Bolus, PCA (Patient Controlled Analgesia) and PIB (Programmed Intermittent Bolus)
- Indicated for IV PCA, PCEA, Subcutaneous, Epidurals, Nerve blocks and Surgical site infusion therapies
- On-board library up to 500 therapy/qualifier/drug protocols
- Should offer programmable demand dose volume, demand dose range of 1-12 demands/hour, with a demand dose lockout period of 5min-24 hours.
- Should be able to program the bolus dose and continuous rate in ml, mg, mcg and ml/hr, mcg/hr respectively.
- Programmable patient and procedure-specific protocols
- Customize security codes per protocol
- Ability to sort/order the protocols on the pump
- Advanced medication error reduction features like Medication Safety Software, Dose limits, Indication of overridden limits, Protocol/drug display always, authorized user access with security codes, Clinician advisory notes
- Easy user-interface for simpler programming
- Titrate dosing without stopping of the pump
- Large color screen with task-based menu that differentiates therapies and displays infusion settings
- On-screen color graphs and trending data
- Track therapy progress with trend and log reports that are easy-to-access and interpret
- Color coded alarm screen (as per priority alarm) with visual help
- Event log report of 5000 new log entries
- Dose lockout period of 5 minutes to 24 hours
- Powered by disposable batteries with accurate, reliable battery gauge information
- Should have at least nominal accuracy level,  $\pm 6\%$
- Should support Medication cassette reservoirs of 50ml, 100ml and 250ml drug volume
- Medication reservoirs and administration sets should have anti-siphon valve and filter.
- The firm should quote of price of all the disposables required to run the machine.

### Certifications:

- Should have IPX rating  $\geq 4$ .
- Pump must be US FDA approved.

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

डा० अमित कुमार वर्मा  
आचार्य  
एनोल्थीसियोलॉजी, मेडिकल केंद्र  
एन एम मेडिकल  
जी.एस.टी.एम. मेडिकल कॉलेज  
कानपुर

Dr. U. S. Meena  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## DVT Pump with Sleeves

- Should provide Sequential Gradient and circumferential compression around the ankle, calf and then the thigh.
- Light weight microprocessor-based pump design.
- Should have Venous Refill Detection Technology for superior emptying of veins
- Personalize decompression cycles for individual patients.
- Should have different compression level at all the points
- Should have preset audible and visual alarms with troubleshooting index display machine itself.
- Should be Light weight, Non-woven and Hydrophobic material of latex and foam free sleeves
- Sleeves should have three different chambers with Different pressure at each chambers
- Simple connecting lock of sleeves to connect with tubing set of machines.
- Should have passive cooling facility should be available in sleeves for better patient comfort
- Consumable should be available in following sizes:
  - Standard calf garments
  - Large calf garments
  - Small thigh garments
  - Medium thigh garments
  - Large Thigh garments
- Machine can be used either on single or both legs. Should have ergonomic handle and integrated versatile bed mount with built in power cord storage.
- It should be easy to clean tubing set to prevent any infection to patients.
- Pump should be compatible to operate on 100-240VAC, 50VA, 50/60 Hz.
- Should have Lithium ion battery which supplies power for 8hours for uninterrupted DVT Therapy
- System should automatically recharges whenever plugged into a wall outlet. Eliminates docking stations and user intervention to charge device.
- Operating and service manual should be supplied along with equipment.

### Certifications:

- System should be approved by US-FDA / European CE (with 4 digit notified body).
- The pump should be built to follow safety standards: UL60601-1, CSA-C22.2 No.601.1-M90, IIST 0601-2-204, EN60601-1 and IEC 60601-1-2 standards classified file #E189131.

### Scope of supply:

- Machine
- Charging cable
- Sleeves: 10

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

डा० अनिल कुमार वर्मा  
अध्यक्ष  
एनेस्थीसियोलॉजी, क्रिटिकल केयर  
एवं एम गैजिटिंग  
जी.एस.बी.एम. मेडिकल कॉलेज  
कानपुर

Dr. P. K. Das  
Associate Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCU  
Dr. RMLIMS, Lucknow

## Patient Warmer

- ❖ The equipment must be a forced air warmer – Should deliver warm air uniformly to the patient through disposable blanket.
- ❖ It should be microprocessor based handy and with accurate temperature sensor system.
- ❖ Time to reach Operating Temperature (Classified as  $32^{\circ}\text{C} \pm 1.5^{\circ}\text{C}$  to  $43^{\circ}\text{C} \pm 1.5$ ) within 2 to 5 minutes.
- ❖ Flicker-free operation defined as Meets UL & IEC 60601-1 Standard.
- ❖ It should have audible and visual alarms in case of over temperature.
- ❖ Alarm Warning Conditions Should be General Fault, Over-Temperature & Under Temperature.
- ❖ Operators' experience sound level should be 48dBA or less then. And Airflow setting should be one speed, non-adjustable Up to 44 CFM (20.8 L/s).
- ❖ Operating temperatures should be Ambient,  $32^{\circ}\text{C}$  ( $89.6^{\circ}\text{F}$ ),  $38^{\circ}\text{C}$  ( $89.6^{\circ}\text{F}$ ),  $43^{\circ}\text{C}$  ( $89.6^{\circ}\text{F}$ ).
- ❖ Unit should have a clamp to fix it either on IV Pole or Bed Rail.
- ❖ Unit should have three Temperature sensors, sensor at Hose pipe end is compulsory so as to confirm even distribution of Warm air from unit to blankets.
- ❖ Price of blanket to be quoted separately applicable for next 02 years.
- ❖ List of users (specially government hospitals)

### Certifications:

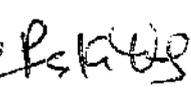
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 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 Dr. C.P. Sanjeev  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

डा० अमित कुमार वर्मा  
 अध्यक्ष

एनेस्थीसियोलॉजी, सिविल सर्जरी  
 एवं चर्म विभाग  
 ली.एस.जी.एम. अस्पताल, लखनऊ  
 लखनऊ

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**Laryngoscope (Adult)**

1. Fiberoptic Blades - Reusable
2. Made of Stainless steel with matte finish - preventing back reflection
3. No dirt-collecting recesses (easy to clean)
4. Can be treated in the autoclave at up to 134°C
5. Compliant with ISO 7376 standards
6. Can be sterilized as instructed in the user manual
7. With integrated fiber optics
8. High power LED used
9. The LED illuminations with excellent light efficiency and superb light transmission.

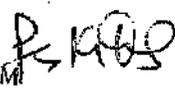
**Scope of supply:**

1. Handle
2. 4 mackintosh blades of different sizes

  
 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 Dr. P. K. Das  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

डा० अनिरुद्ध कुमार वर्मा  
 एनेस्थीसियोलॉजी, सिंगल कैयर  
 एवं पैन मेडिसिन  
 जी.एस.पी.एस. मेडिकल कॉलेज  
 लखनऊ

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

### Laryngoscope (Pediatric)

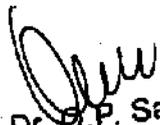
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9. The LED illuminations with excellent light efficiency and superb light transmission.

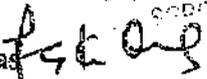
#### Scope of supply:

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 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.I.M.S., Lucknow

डा० अजित कुमार वर्मा  
 एनेस्थीसियोलॉजी, क्लिनिकल केंद्र  
 एंड रेन मेडिसिन  
 जी.एस.बी.एस. मेडिकल कॉलेज  
 काशीपुर

  
 Dr. P.P. Sanjeev  
 Assoc. Professor  
 Dept. of Emergency  
 S.G.P.G.I.I.M.S.

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## Basic Video Laryngoscope

GENERAL USE		
1.1	Clinical purpose	For viewing vocal folds and glottis. Surgical and mechanical ventilation / intubation
1.2	Used by clinical	/ ICU / Casualty / training
1.3	Overview of functional requirements	A light source on or via the blade illuminates the larynx to allow viewing and tube passage. The unit is handheld with internal batteries and has interchangeable, rigid blades of different sizes with display screen and external connection facility for demonstration.

TECHNICAL CHARACTERISTICS		
2.1	Technical characteristics (specific to this type of device)	Fiber optic Laryngoscope with LCD Display preferably should be single patient use to ensure no infection to the patients, should comprise of disposable handle and reusable light source using the latest LED technology. The main body of the handle should incorporate an excellent grip & should feel even wearing a glove. There should be a freely moving light intensifier of light from the light source through to the tip of the fiber optic blade to prevent any possibility of cross contamination. The unit should allow the blade to be inserted easily & should provide a positive locking mechanism when moved in to the closed position. The patient contact material should be biocompatible.
	Display	LCD SCREEN SIZE 3.5" Full View, Resolution Ratio 640x480 RGB, Aspect Ratio 4:3 Video Refresh Rate: 30FPS, Illumination : LED. Screen is reinforced with antishatter protection
	Laryngoscope blade Camera	Included Resolution ratio 2.0 M Pixels, Field Angle 66°, Illuminance : ≥800LUX
	Data Output Image Output	Easy to Establish and store files Connect to External Monitor and convenient for training and presentation
2.3	User's interface	Manual
PHYSICAL CHARACTERISTICS		
3.1	Weight (lbs, kg)	Light weight
3.2	Configuration	1. Handheld unit, single piece when in use 2. On/off switch to be robust and easy to use 3. External material to be non-ferrous 4. Blades to be surgical grade stainless steel and autoclavable 5. Supplied in protective, reclosable case
3.3	Mobility, portability	Yes
3.4	Others	storage box should be provided
ENERGY SOURCE		
4.1	Power Requirements	Independent of external source
4.2	Battery	Type: Rechargeable Lithium Battery Long working time : > 200 minutes Voltage 3.7 V Capacity : 3200mAh Battery Life Cycle : more than 300 charges Charging time: Less than 8 Hrs.
	Power Adapter	Type: Rechargeable Lithium Battery Long Working Time : > 200 minutes Voltage 3.7 V Capacity: 3200 mAh Battery Life Cycle : More than 300 Charges Charging time: Less than 8 Hrs.

ACCESSORIES, SPARE PARTS, CONSUMABLES		
5.1	Accessories (mandatory, standard,)	Batteries, light source, macintosh blades of all available adult and pediatric sizes
5.2	Spare parts (main ones)	Handle
5.3	Consumables / reagents (open, closed system)	5 LED should be given as spare

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

डा० जितेंद्र सिंह चहार  
एनेस्थीसियोलॉजी, सिकंदरा बाजार  
एन.एस.जी.एस. मेडिकल कॉलेज  
कानपुर

Dr. O. P. Singh  
Associate Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

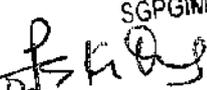
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

6 ENVIRONMENTAL AND DEPARTMENTAL CONSIDERATIONS		
6.1	Atmosphere / Ambiance (air conditioning, humidity, dust...)	Operating condition: - Capable of operating continuously in ambient temperature of 0 to 50 deg C and relative humidity of 15 to 90% in ideal Circumstances. - an ambient air velocity is less than 0.3 m/s. Liquid splash resistant Blades should be autoclavable
6.2	User's care, Cleaning, Disinfection & Sterility	Should be autoclavable
7 Certifications		
7.2	Certificates (pre-market, sanitary, ...); Performance and safety standards (specific to the device type); Local and/or international	ISO7376 standard; Manufacturer / supplier should have ISO certificate for quality standard. The lithium battery should comply to IEC 62133 or its equivalent. The device should meet IEC 60601-1, IEC 60601-2 standard requirements. Should be BIS/FDA / CE approved product

  
 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 डा० अनिल कुमार वर्मा  
 अध्यक्ष  
 एनेस्थीसियोलॉजी, क्लिनिकल केयर  
 एवं पैन मैनेजिमेंट  
 जी.एस.पी.एम. मेडिकल कॉलेज  
 कानपुर

  
 Dr. P. Sahjeev  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## Advanced Video Laryngoscope

### Monitor

- Screen 8 to 12 inch in size for display with touch screen to control features with HDMI output for connecting to a big screen which can display picture simultaneously on both screens.
- Monitor should have two ports to connect two video scopes (VL & Flexible scope) at one time and picture can be swapped using touch screen.
- Monitor should be chargeable, to be supplied with charger and should have facility to be used while charging.
- Monitor resolution should be minimum 1920 X 1200 pixels in 16:9 format.
- Integrated recording of Audio, Video and Still images should be possible on data card or USB drive with JPEG, MPEG, MP4 format which can be easily transferred to the computer/laptop. Documented videos & still images should be easily recalled/Playback on the monitor.
- Monitor should have Picture-in-Picture & side-by-side mode to view images from 2 different video scopes attached (video laryngoscope blades and flexible video scopes).
- Monitor should be splash proof according to IP 54 and should be shock resistant.
- Monitor should have lithium-Ion rechargeable batteries and run for at least 100 mins. when fully charged.
- Soft bag from same manufacturer should be supplied to place the monitor and system can also be operated without taking monitor out from the bag.
- Adult and Pediatric angulated Magill forceps from same manufacturer to be provided for foreign body removal and for assisting nasal intubation while using blades.
- Same Monitor should be compatible with all the below mentioned scopes of same manufacturing principal company-
  - Reusable video laryngoscope
  - Single use video laryngoscope
  - Reusable Flexible Intubation video endoscope
  - Single use Flexible Intubation video endoscope
  - Video Intubation endoscope with flexible tip

### Video Laryngoscopes - Reusable

- Blades and connection cable should be fully immersible in disinfecting solution.
- Blades should have a button for real time documentation.

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

डा० जितेंद्र चव्हाळ  
असिस्टंट प्रोफेसर  
एनेस्थीसियोलॉजी, क्लिनिकल ईमर्जेन्सी  
एंड इंटेंसिव्हिव्ह मेडिसिन  
जी.एस.पी.एस. मेडिकल कॉलेज  
कराचुर

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Dr. O.P. Sanjeev  
Assoc. Professor  
Dept. of Emergency Medicine  
S.G.P.G.I.M.S., Lucknow

- Blades can be sterilized using Sterrad and Steris system. Thermal disinfection up to 93 degrees and Chemo-thermal disinfection up to 65 degrees should be permissible.
- Macintosh blade size 3 producing resolution of minimum 800p.
- Macintosh blade size 4 producing resolution of minimum 800p.
- Special angulated Adult Blade for difficult intubation with device for introduction of suction catheter of size 16-18 Fr., angle of view should be 70 degree or more should be provided with stylet from same manufacturer.

#### Trolley-

- Trolley to hold monitor, processor, light source and hang flexible scopes should be supplied.
- Protection cap for video laryngoscope blades should be provided for proper cleaning and sterilization.
- Tray for cleaning and sterilization of blades (at least two blades at a time) from the same manufacturer should be provided.
- Compatible tray for sterilization and disinfection of flexible intubation scope from same manufacturer should be supplied.

#### Note: -

1. All quoted items should be from the same manufacturer for total system compatibility and optimal system performance.
3. The system should be USFDA / European CE certificate with 4 digit notified body.
4. OEM should have ISO 13485:2016 certified service process in India.

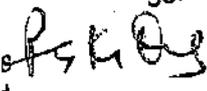
#### Scope of supply:

1. Monitor with processor with light source
2. Trolley
3. 3/4 no. blade - 1
4. D blade - 1

Dr.  Mendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

एनेस्थीसियोलॉजी, इंटिवेन्सिव क्वीयर  
एवं पैरामेडिकल  
जी.एस.डी.एस. मेडिकल कॉलेज  
काशीपुर

Dr.  P.K. Das  
Associate Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

Prof. P.K. Das   
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. R.M.I.M.S., Lucknow

### Air mattress

1. Tubular therapeutic pressure redistribution support system without pump.
2. Mattress should have two layer construction comprising antimicrobial foam top surface and minimum 9 transversal air filled cylinders.
3. Cover should be made up of bactericidal core material blended with butyl rubber backing with breathable properties to inhibit microorganism growth and to manage moisture.
4. Base should have nonskid material
5. Pressure redistribution under the shoulders, seat and legs via air cylinders for protecting skin of medium to high risk patients from development of pressure ulcers.
6. Non electric powered & without pump operating technology to reduce electrical costs, unnecessary alarms and system breakdowns and uninterrupted pressure relief even in the event of an electrical power failure.
7. Self-adjusting technology comprises of dynamic air chambers and cut-off valve to help to maximize body weight displacement and minimize tissue interface pressure by automatically adjusting the internal air pressure in reaction to body movement, altitude and temperature.
8. Individual & independently operating air chambers with intake and regulating valve that automatically regulates internal air pressures of the mattress to optimize patient weight displacement and help manage skin breakdown without the need for air reservoirs, manual adjustments or monitoring.
9. Sloped heel section to help to transfer weight off of the heel and onto the calf and thigh area of the leg.
10. Firm perimeter to provide seating support for the patient.
11. Flammability: Mattress material should meet TB 117 standards and all mattresses meet Federal cigarette ignition standards.
12. Dimension: Length 200 cm (80 inch) x Width 87.5 cm (35 inch) x Depth 17.5 cm (7 inch)
13. Should be able to support up to 220Kg patient weight.

#### Certifications:

1. USFDA / EU CE / BIS from four digit notified body.

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

डा० अमित कुमार वर्मा  
एनेस्थीसियोलॉजी, इमिजना केंद्र  
एन.एस.एस.एस.  
जी.एस.एस.एस. एमिजना केंद्र  
लखनऊ

Dr. P. K. Das  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Resuscitation Kit/ Tray

## 1. Generic Specifications

i.	Product description	Resuscitator / Resuscitation Kit
ii.	Clinical purpose	For medical procedures involving repeated cycles of compression of the chest and artificial respiration, performed to maintain blood circulation and oxygenation in a person who has suffered cardiac arrest
iii.	Patient application	Adults
iv.	Face mask size	3,4
v.	Number of face masks in a kit	2 Nos of each size
vi.	Material of Mask (Non-toxic and non-allergic; Medical grade)	Silicon Rubber and TPE(Thermoplastic Elastomer)
vii.	Face masks are transparent with good quality air seal facility	Yes
viii.	Self inflating resuscitator bag	Yes
ix.	Material of resuscitation bag	Silicon and 100% Latex Free
x.	Resuscitation bag capacity (ml)	300 to 550
xi.	Number of resuscitation bags in a kit	1
xii.	Construction of resuscitator bag	Double wall type
xiii.	Mask and resuscitator bag are autoclavable to 134 deg C	Yes
xiv.	Built-in pressure limitation facility for the resuscitator bag	Yes
xv.	Non-rebreathable one way valve	Yes
xvi.	PEEP Valve and manufacturer of resuscitator bag	Same
xvii.	Provision of integrated handle in Resuscitator bag	Yes
xviii.	Connection for manometer port	To be specified by bidder/supplier
xix.	Material of the reservoir bag (Latex free, Medical grade, Non-toxic and non-allergic)	Polyvinyl chloride (PVC)
xx.	Reservoir bag capacity (ml)	1500 to 2600
XX I	Laryngoscope with 4 machintosh blades & handle (adult)	
xxii	Laryngoscope with 3 miller blade (pediatric)	

Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.C.P.G.I.M.S., Lucknow

डॉ. जितेंद्र सिंह चहार  
 सहायक प्रोफेसर  
 कठिन देखभाल विभाग  
 सी.एस.पी.जी.एम.सि., लखनऊ

Dr. P.K. Das  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

xxii i	Pharyngeal airway 4 different sizes		
xxvi	PVC ET tube of sizes 3,4,5,6,7,8		

### 2. Packing mode

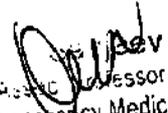
i.	All the items of the kit are placed in a waterproof bag / container in such a way that there should not be any transit damage during transportation	Peel off / zipper type carrying bag	
ii.	Carrying box or bag should have sufficient space to keep drugs and disposable items	Yes	

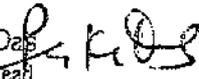
### 3. CERTIFICATIONS & REPORTS

i.	Submission of Test Report for all kit items from OEM complying the declared specification at the time of supply	YES	
ii.	Product certification	EU-CE	
iii.	Number of times Resuscitator bag can be autoclaved and re-used (Nos) Minimum	20	

  
 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

डा० अजित कुमार वर्मा  
 एनेस्थीसियोलॉजी, मेडिकल केंद्र  
 एवं रेसुसिटेशन  
 जी.एस.पी.एस. मेडिकल कॉलेज  
 कानपुर

  
 Dr. P.K. Das  
 Associate Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow



## Spirometer System

1. Should be a portable device, easy to handle with plug and play system.
2. Should have calibration-free Ultrasonic technology.
3. Should fully conform to ATS/ERS guidelines.
4. Should measure and calculate BTPS correction online at the time of measurement.
5. Flow sensor should be resistance-free using ultrasound technology.
6. Should perform complete spirometer test including FVC, SVC, and MVV both pre and post.
7. **Should measure:** MEF 75-85, MIF50%, MEF50 [%], FEV1, FIV0.5, EV%FVC, FVC, AEX, AIN, BF, MIF 50, FEV, FEV 6, PEFT, T, TOT, IC, IRV, VC EX & IN, VT, VC MAX, PIF, TI/TE, MIF 25, T IN & EX, PEF & MV
8. Should be supplied with branded PC/Laptop with i5 processor and 1 TB SSD hard disc and Colour Laser printer.
9. System interface with a computer should be through USB

### Certifications:

1. Should be USA FDA / European CE be approved by 4 digits notified body.

### Scope of Supply:

- a. Main Unit
- b. Disposable Breathing Tube: 50 nos.
- c. Nose Clips: 10 nos.
- d. Latest Configuration PC and Printer

### Future up-gradation

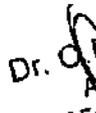
- Rhinomanometry
- Tidal Breath Analysis
- Provocation Test

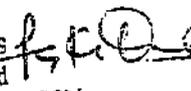
  
Dr. Jitendra Singh Chahar,  
Assistant Professor

Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

डा० अभिल कुमार वर्मा  
आचार्य

एनेस्थीसियोलॉजी, क्रिटिकल केयर  
एंड पैन मेडिसिन  
जी.एस.टी.एम. मेडिकल कॉलेज  
काठगढ़

  
Dr. P.K. Das  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

S No.	Bioreactance Non-Invasive Fluid Management Monitoring System
1	Fluid therapy management system based on Bioreactance. 100% non-invasive monitor using externally applied sensors on the thorax. Measures cardiac output/ stroke volume and other related parameters to guide fluid therapy based on Bioreactance technology
2	Quick dynamic assessments for fluid responsiveness, self-calibrated, gives parameters like Cardiac Output (CO), Cardiac Index (CI), Stroke volume (SV) System Vascular Resistance (SVR) or Total Peripheral Resistance (TPR), Total Peripheral Resistance Index (TPRI), Stroke Volume Variation (SVV), Cardiac Power (CPO), Cardiac Power Index (CPI) & Contractility index for heart -Dx/Dt; Oxygen delivery Index (DO <sub>2i</sub> ) & Total thoracic fluid content (TFC)
3	Provide dynamic assessment and real time fluid management dashboard to guide fluid therapy through Passive Leg Raise (PLR) and Bolus Challenge both
4	Exceptional Clinical Tools for Fluid Therapy Management - Fluid Management Dashboard for both PLR and Bolus, Real-Time Fluid Management Display, Excel reports to USB Drive with Fluid Management graphs
5	100% noninvasive monitor with touch screen with minimum 10 inch screen display (single unit). Data storage capability
6	Bioreactance technology to give an accurate and precise measurement. The firm should submit clinical validation studies with the equipment versus the gold standard like PAC and relevant studies of fluid responsiveness in sepsis and shock patients
7	Should not cause interference nor get interfered by other standard ICU equipment such as ventilators, cardiac monitors, etc.
8	Accuracy should not be affected by changes in arterial compliance e.g. vasopressors or shock state. Should give fluid responsiveness in mechanically ventilated and spontaneously breathing patients
9	Frequent Data Updates on screen like 4 seconds, 8 second, 16 seconds, 24 seconds, and 48 seconds or equivalent.
10	Provide Blood pressure (NIBP) option. Can be available with SpO <sub>2</sub> module with Bioreactance
11	Should be able to run on mains and battery. Battery life of at least 6 hours.
12	Connectivity to external 3rd part system via serial port, LAN or WiFi
13	Equipment should be available for demonstration with all clinical validations.
14	It should be validated in patients with sepsis, cardiac patients, obesity, respiratory diseases, and pulmonary edema.
	<b>Certifications:</b> US FDA/EU CE from four digit notified body

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

Dr. Anil Sanjeev  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

डा० अनिल कुमार वर्मा  
आचार्य  
एनेस्थीसियोलॉजी, क्रिटिकल केयर  
एवं रेसिडेन्स  
जी.एस.डी.एम. मेडिकल कॉलेज  
कानपुर

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Blood and Fluid Warmer

1. Saline warming Cabinet in different capacity Size
2. Suitable to hold IV Fluids bottles
3. Bright LED display with 0.1°C resolution.
4. Microprocessor based digital monitor to display:- Temperature reading shown on Double display.
5. Temperature reading shown in °C/ °F.
6. Temperature value settable between  $\pm 25^{\circ}\text{C}$  to  $80^{\circ}\text{C}$ .
7. Audio/ visual alarms for: Temperature, Door Open, Power Failure & Sensor Failure.
8. Led Indications for: Temperature Fail, Power Fail, Door Open, Heat on, Silence Mode.
9. Integrated Voltage protective device against excessive voltage fluctuation.
10. Double vacuumed Glass Door as standard/ Solid Door
11. Password Protection to enter main Setting.
12. Inner chamber of stainless steel for rust free interior.
13. Outer chamber choice of
  - A) Powder coated material
  - B) Stainless steel 202 Grade
  - C) Stainless steel 304 Grade.
14. Storage capacity of 150/250/400 + liters (to be chosen as per the need).

### Certification:

1. BIS and ISO Certification.

Dr. Jitendra Singh Chahar,  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

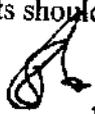
Dr. P. Banjeev  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

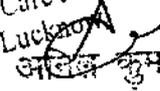
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आचार्य  
एनेस्थीसियोलॉजी, इन्टिकल केयर  
एवं पैन मैनेजिमेंट  
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फाजिल्हा

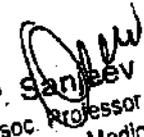
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## BROAD BASED QR FOR TOTAL TEMPERATURE MANAGEMENT WITH BLANKET

1. It should deliver warm air uniformly to the patient through disposable blankets.
  2. It should have temperature selection between 32-43 degree Celsius, should have the single button to set temperatures – low, medium and high temperature.
- Average temperatures at the end of the hose:**  
**HIGH: 43° +/- 1.5°C**  
**MED: 38° +/- 1.5°C**  
**LOW: 32° +/- 1.5°C**
3. It should have three temperature sensor with hose end temperature control system. (Patient side)
  4. It should be silent, and the noise levels should not exceed 53dba(High speed). The unit should have the provision to mount on the pole.
  5. It should have audible and visual alarms feature such as over temperature, under temperature, temperature in range.
  6. The machine should be able to shut down the blower and give over temperature alarm at degree of the selected temperature.
  7. It should be able to filter air with 0.2-micron filters or better and filter must adhere to MERV14 standard.
  8. It should be able to generate an airflow of at least 44 CFM and above.
  9. It should have adjustable fan settings (2 speeds or more).
  10. It should display filter changing indicator and filter should change after every 500-1000 hrs of machine running.
  11. Machine should have digital hour meter to evaluate the duration of warming therapy in surgery.
  12. It should be delivered with 100 multi position blankets.
  13. The blankets should be latex free with superior top layer having **insulated and unique air channels for even heat distribution** and even incase of tear it should continuously working and deliver required **uniform heat distribution**.
  14. The blankets should be **non-conductive, non-irritable, lint free and must confirm to flammability standards**.
  15. The blankets should be provided with two resealable hose ports for positioning flexibility.

  
 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S. Lucknow

  
 डॉ० अनिल कुमार शर्मा  
 आचार्य  
 एनेस्थीसियोलॉजी, मेडिकल कैंसर  
 एवं फोर रेडियोलॉजी  
 जी.एस.टी.एम. मेडिकल कॉलेज  
 कानपुर

  
 Dr. O.P. Sanjeev  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

  
 Prof. N.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

16. The blanket must have a clear head drape and two neck vents to keep warm air around the intubated patient's head and allow observation.

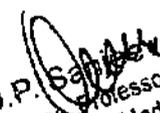
17. Blankets and equipment should be from the same OEM.

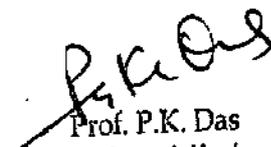
Certifications:

- USFDA/CE/BIS
- IEC 60601-1

  
Dr. Jyoti Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

  
डा० अनिल कुमार वर्मा  
आचार्य  
एनेस्थीसियोलॉजी, क्रिटिकल केयर  
एवं पैन मैनेजिमेंट  
पी.एस.सी.एम. रीजनल क्वालिटी  
सेन्टर

  
Dr. O.P. Sanyal  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

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## Integrated Pulmonary LAB/ PFT System With Spirometry & Lung Diffusion (DLCO)

1. The unit should be exclusively designed to carry out examination of pulmonary system and to measure & display lung function parameters, operable on 220 Volts A.C. mains, not requiring large installation space (compact and preferably table mounted). It should be built on an expandable platform for future up-gradation.
2. It should be PC based having software programs for Spirometry, MVV, Flow/ Volume, pre-post comparisons, volume subdivisions FRC and RV with single breath CO diffusion using latest CO-CH4 gas analyzer to determine distribution abnormalities.
3. It should have an open breathing system to prevent cross contamination for spirometry.
4. The system should incorporate a light weight, precision Pneumotach sensor free from any kind of frictional inefficiencies with the following measurement ranges: -
  - a. **Flow Measurement**
  - b. Range : 0 to +/- 14 l/sec with accuracy better than +/- 2.5% subject to a min of 50 ml/sec and resolution as low as 10 ml/sec.
  - c. **Volume measurement**
  - d. Range : 0 to 20 liters with resolution of 10 ml
  - e. **Corrections**
  - f. Flow Volume : ERS or ATS
  - g. Inspiratory Gas qty : BTPS (automatic breath by breath)
5. It should be able to measure the following parameters **TLC, FRC, RV, RV/TLC, FRC/TLC, IRV, VC, VC in, VC ex, ERV, IC, T<sub>l</sub>CO & Hb corrected DLCO, KCO, AV, Flow Volume loops and basic spirometric parameters including MVV and SVC.**
6. **The Analyser should be one of the most linear one over the full range of measurement Infrared CO, CH4 or CO He, multi-gas with 0-0.35% range having automatic calibration/ quality control.**
7. It should be supplied complete with hardware, instruction manual and other standard accessories including 2 Gas cylinders (10Ltr. WC) for a minimum of 300 diffusion tests
8. The system should come with a touch screen Tablet with WINDOWS 10/ 11 OS and suitable printer from a respected brand from a respected and established international brand.
9. The system should be supplied with 200 PFT Filters and 10 nose clips.
10. The system should conform to ATS and ERS standards.

### Certifications:

1. The manufacturer should be an EN ISO 9000 and ISO 13485 accredited company and should be duly US FDA certified and CE marked to MDD for medical devices from a notified body. 510K report should be submitted with the bid.

Dr. Nitendra Singh Chauhan  
Assistant Professor  
Department of Critical Care Medicine  
S.O.P.G.I.M.S., Lucknow

डॉ. जयशंकर कुमार वर्मा  
रजिस्ट्रीत विशेषज्ञ, कोटिका केंद्र  
एन एस सी एस मेडिकल कॉलेज  
कानपुर

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Dr. O.P. Sanjeev  
Assoc. Professor  
Emergency Medicine  
S.O.P.G.I.M.S., Lucknow

## Oxygen flow meter

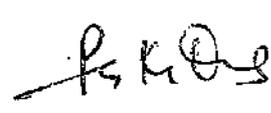
### Specifications:

1. Flow Rate Range: 0 - 15L / min
2. Accuracy:  $\pm 5\%$
3. Pressure Compensation: to ensure accurate readings even when the input pressure fluctuates.
4. Inlet Connection: Standard inlet connections include ISO G 1/8" prime prime or CGA540.
5. Materials: Flow tubes and humidifier bodies made of high-strength polycarbonate plastic, while the ball inside the flow tube of stainless steel.
6. Calibration: Flow meters are calibrated at a specific inlet gauge pressure, 50-55 psi (3.4-3.8 bar)
7. Accurate readings even when the input pressure fluctuates.
8. Inlet Connection: Standard inlet connections include ISO G1/8" or CGA540.
9. Safety Features: like pressure relief valves to prevent overpressure.
10. Mounting: Flow meters can be wall-mounted or rail-mounted.
11. Humidifier Bottle: to add moisture to the oxygen flow.

  
 Dr. Jitendra Singh Chahar,  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

डॉ० अमल कुमार वर्मा  
 एनेस्थीसियोलॉजी, मेडिकल कैम्पस  
 एंड एम. मेडिसिन  
 जी.एस.पी.एम. मेडिकल कॉलेज  
 कानपुर

  
 Dr. O.P. Sanjeev  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGP GIMS, Lucknow

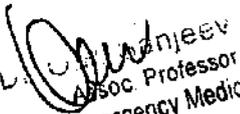
  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

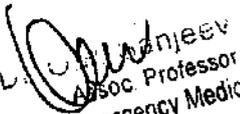
## CARDIOPULMONARY EXERCISE TESTING SYSTEM (CPET)

1. The Cardiopulmonary Exercise Testing System should be trolley mounted with the following specifications:
  - a) **Cardio-pulmonary Exercise Test:** The system should be able to perform online Breath by Breath and Internal Mixing Chamber measurement of  $VO_2$ ,  $VCO_2$ ,  $VO_2$  Max, Sub-max  $VO_2$ , Thresholds  $VT_1/LT_1$ ,  $VT_2/LT_2$ , EFVL, Heart Rate(HR), VE, VT, RF, RQ (RER),  $FeTO_2$ ,  $FeTCO_2$ , Workload,  $VO_2/HR$ , etc. Estimated Cardiac Output & Stroke Volume, Indirect Calorimetry (REE & RMR), RQ, %FAT, %PRO, %CHO Anaerobic/Ventilatory Thresholds, Respiratory Compensation Point (RCP), Exercise Flow Volume Loops (EFVL), Advanced Steady State Analysis, Training Zones, FatMax calculator, MECKI score indicating chance of cardiovascular death
  - b) **Spirometry:** FVC - Pre/Post/Challenge, SVC - Pre/Post, MVV
  - c) **Integrated Pulse Oximeter** with Finger Clip sensor
  - d) **Integrated 12 Lead ECG with full disclosure**
  - e) **Automatic Blood Pressure Measurement through Bike**
2. **Flow meter:** Should be digital Bi-directional Turbine with a flow range of 0 to 16 L/s, Ventilation Range 0-300 L/m, Accuracy:  $\pm 2\%$  or 20 mL/s
3. **O<sub>2</sub> Sensor:** Type: GFC, Range: 0-100% O<sub>2</sub>, Accuracy:  $\pm 0.05\%$  Vol. or  $\pm 0.3\%$
4. **CO<sub>2</sub> Sensor:** Type: Non-Dispersing Infrared (NDIR), Range: 0-10% CO<sub>2</sub>, Accuracy:  $\pm 0.05\%$  Vol. or  $\pm 1\%$
5. **Environmental Sensors:** The system should have Temperature, Barometric and Humidity Sensors.
6. All sensors should be non-consumable.
7. **Cycle Ergometer:** Compatible and automatically controlled by CPET system. Load range 6-999 watts in steps of 1 watt, RPM 30-130, adjustable Seat Height and handle bard, Automatic BP measurement, Graphic LCD Display, RS232 Interface. Should also be programmable and run without PC, if needed.
8. **Software:** Software should be supplied with the equipment. The management software should be designed for Windows 10/11 environments
9. **Scope of supply:**
  - a) Mobile Cart
  - b) Calibration gas cylinders - 01 nos.
  - c) Regulator - 01 nos.
  - d) Anti-bacterial / Viral Filters - 500 nos.
  - e) Adaptor Face masks for AB Filters - 05 nos.
  - f) Nose Clips - 100 nos.

  
 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 Dr. Anil Kumar Verma  
 अध्यक्ष  
 एम्बुलेंस सेवा केंद्र  
 एम्बुलेंस  
 जी.एस.डी.एम. मेडिकल कॉलेज  
 कानपुर

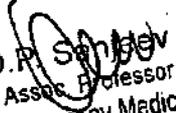
  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

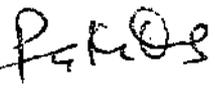
  
 Dr. Anandjeet  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

- g) Branded Desktop Computer system with Intel Core i5 Processor, 8 GB RAM, 1 TB HDD, Dual 19" LED Color Monitors, 8 USB ports, Com Port, Keyboard, Mouse, Windows 10/11, Color Deskjet Printer and UPS 1KVA in ready to use configuration.
10. List of standard accessories and List of consumables with their life should be provided.
  11. The system should have US FDA/ European CE certifications.
  12. The system should have ISO certifications.

  
**Dr. Jitendra Singh Chahar**  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.C.P.G.I.M.S., Lucknow

  
**डा० अनिल कुमार**  
 अध्यक्ष  
 एनेस्थीसियोलॉजी, क्रिटिकल केयर  
 एवं रेन मेडिसिन  
 जी.एस.जी.एम. मेडिकल कॉलेज  
 कानपुर

  
**Dr. O.P. Singh**  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

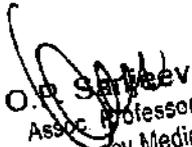
  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

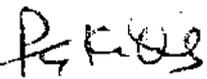
### High Flow Nasal Oxygen Therapy Device (HFNO)

1. A microcontroller base fully automatic high precision High flow Oxygen therapy device of international standards for use with Adult, Paediatric and Neonatal group patient.
2. Display should be colour and 5 inch or more with Brightness adjustments and Day and night mode.
3. Blower/Turbine should be inbuilt for air source.
4. The setting parameters should be electronic and as per below:
  - a) Temperature: 31-39°C
  - b) Flow Range: 5-80 L/min for Adult/Paediatrics and 2-30L/min for Neonatal/Paediatrics.
  - c) FiO<sub>2</sub>: 21-100 %
5. **Oxygen Supply:** Integrated Oxygen blender with HPO and LPO.
6. Battery Backup should be 2 hours or more.
7. Monitoring parameters should Flow, Fio<sub>2</sub> and Temp should be standard and Spo<sub>2</sub>, Pulse, Perfusion as optional.
8. Alarms are following: Loss of power, Battery low, Battery replacement, Check ambient temperature, Check settings, Patient group changed, O<sub>2</sub> sensor calibration needed etc.
9. Alarms are indicated in the colour associated with the alarm priority as follows:
  - a) High priority: red, with alarm message
  - b) Medium priority: yellow, with alarm message
  - c) Low priority: yellow, with alarm message other: Technical fault: Entire display is red and the alarm message is displayed
10. Aerogen nebulizer should be up-grable and compatible with device.
11. Breathing circuit Single lumen, double walled, heated / coded patient group recognition and for minimum 14 days usage of single circuit.
12. Connectivity PDMS by USB port/RS-232/WiFi.
13. Should be USFDA / EU CE from four digit notified body.

  
 Dr. Jitendra Singh Chahar,  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 डॉ० अनिल कुमार वर्मा  
 अध्यक्ष  
 एनईसीसीएसीसी, डिस्ट्रिक्ट कैंसर  
 एवं रीज रेजिडेंस  
 जी.एस.बी.एन. मेडिकल कॉलेज  
 कानपुर

  
 Dr. O.P. Sarjeev  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## Surgical Scrub Sink (2 bay)

### 1. Hand wash unit

- The HWS unit should be made out of 18/20 G SS 304 Q sheets duly matt finished.
- The wash station must be provided with auto taps, auto stainless steel liquid soap, IPA (sanitizer) dispenser & Hand dryer.
- A front door needs to be provided below the sink for maintenance.
- The unit should be either free standing or wall mounted (preferably).
- The water supply pipe will be of 0.5" and drainage pipe will be of 1.5" UPVC.
- Overall Dimension 43" x 18" x 34 + 24" H, Sink size - 530 x 325 x 200 mm D- 2, Auto taps - 2 nos. Soap dispenser - 1 no., IPA dispenser - 1 no., Hand dryer - 1 no.

### 2. SS Hand Dryer

- Body Material: Stainless Steel (304G)
- Power: 1800 W
- Power Supply: AC 220V-50Hz
- Air Speed : 95 m/s
- RPM : 25000
- Drying Time : 7-10 seconds
- Noise Level: 75 db
- Dimension : 240\*174\*270 mm

### 3. SS Soap & Ipa Dispenser

- Body Material : Stainless Steel (304G)
- Capacity : 900ml
- Detection Zone : 10-15cms
- Drop : 1ml
- Dimension : 110\*275\*106 mm
- Battery : 6\*AA Duracell / Alkaline Battery
- Suitable For Alcohol Gel, Liquid Alcohol, Liquid Soap, Hand Sanitizers, Sterilised Iodine & Detergents

### 4. Auto Sensor Taps

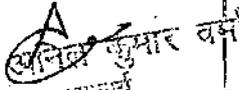
- Power: DC 6V-220V/50Hz (AC)
- Battery : 4x AA Duracell / Alkaline Batteries
- Power Consumption : 0.5 mw (DC), < 2 W (AC)
- Detection Zone : 12-18 cm
- Water Pressure : 0.05 - 0.6 Mpa
- Degree of Protection : IP 56
- Available in AC & DC

5. Thermostatic mixing control valve to maintain constant desired water temperature

### Certifications:

- Company should be ISO certified.

  
Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

  
Dr. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. O.P. Sanjeev  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

## INFUSION PUMP (VOLUMETRIC)

1. The equipment should have a programmable Roller type Peristaltic pump / Volumetric Pump technology for delivery of IV fluids and blood/blood products ranging between 0.1 ml to 999.9 ml per minute.
2. The Equipment should have high levels of safety from air embolism by integrating atleast two ultrasonic air detection sensors.
3. Heating process should be done by an electromagnetic induction heating system.
4. The Equipment should have two infra -red temperature sensors for accurate delivery of fluids at 37 degree celcius.
5. The equipment should have the facility to automatically purge air for removal of any outgassed air to prevent it from entering the patient line. No manual process should be involved.
6. Programmable to any I.V.tubing
7. Suitable for micro/adult infusions
8. Audible and Visual alarms
9. Keep Vein Open(KVO)
10. Air in Line Detector
11. Free flow protection.
12. The equipment should have operator controlled Bolus infusion key for rapid response in critical situations.
13. The equipment should have a line pressure control sensor for restriction of flow in case of line occlusion immediately and stop the delivery of fluids for patient safety.
14. The Equipment should have a recirculate mode for pre - warming of fluids during transport.
15. The Equipment should have an interactive on-board LCD display system which displays information about the rate of infusion, total volume infused, real temperature of fluids, line pressure etc.
16. The equipment should have an internal rechargeable battery backup for 5 hours.
17. Consumables should be universal for all flow rates ranging between 0.1 ml to 999.9 ml per minute
18. The Principals must give a certificate that if the supplier/ vendor is changed during the course of guarantee/ warrantee period ,the principals would be responsible for the upkeep/maintenance of the quote/ supplied equipment, besides honoring all the terms and conditions of AMC in letter and spirit.
19. Data entry calculator style numeric programming keyboard
20. Pole or Tripod Multi-function mounting clamp

Dr. Atendra Singh  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

डा० अमित कुमार वर्मा  
एनेस्थीसियोलॉजी, क्लिनिकल केयर  
एवं पैन मेडिसिन  
जी.एस.वी.एम. मेडिकल कॉलेज  
काजपुर

Prof. P.K. Das  
Professor & Head  
Dept. of Anesthesiology & CCM  
Dr. RMLIMS, Lucknow

Dr. P. K. Das  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

21. Time and date settings
22. Accuracy  $\pm 3\%$ .
23. Spares/ Consumables should be available for a period of at least 5 years after expiry of the guarantee/ warranty period.
24. Performance certificates from satisfied customers from Central Govt. /State Govt. /reputed private hospitals must be appended in respect of the quoted equipment.

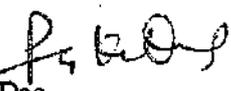
**Certifications:**

- US FDA / EU CE

  
**Dr. Jitendra Singh Chahar**  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 डा० अनिल कुमार वर्मा  
 प्राचार्य  
 एनेस्थीसियोलॉजी, क्रिटिकल केयर  
 एवं वैन मेडिसिन  
 जी.एस.वी.एम. मेडिकल कॉलेज  
 कानपुर

  
**Dr. P.K. Das**  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## Mobile Airway Bronchoscope

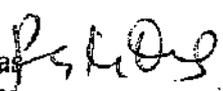
1. It should be high-definiton image quality.
2. It should have tiltable and rotatable 3.5-inch monitor.
3. It should have built-in LED light source.
4. It should record Still Image / Movie Recording on a SD card
5. It should be 2 or more programable buttons to utilize the maximum feature.
6. It should have a field of view of 90 Degrees.
7. It UP Angulation should be  $\geq 180$  Degrees and Down Angulation should be  $\geq 130$  Degrees.
8. Rigid Distal diameter should be 4.5 – 5.5 mm.
9. The insertion tube diameter should be 4.5 – 5.5 mm.
10. It should have a Instrument/suction Channel of 2 – 3 mm.
11. The Working Length should be  $\geq 500$ mm.
12. Depth of field should be 3-50 mm.
13. It should be Plasma sterilization compatible for better hygiene and safety to patients.
14. It should have battery backup of minimum one hour.
15. It should have a rotatable PVE connector to avoid damage to the Cable.

### Certifications:

1. US FDA/ EU CE/ BIS

  
 Indra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 डॉ० प्रकाश कुमार दास  
 प्राध्यापक  
 एनेस्थीसियोलॉजी, इमिजिनेस केंद्र  
 एन केन मेडिकल  
 जी.एस.बी.एम. मेडिकल कॉलेज  
 कानपुर

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Dr. O.P. Sanjeev  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

# Integrated Difficult Airway Scope System

## Monitor - 8 inches

- Full HD 8-inch High-end Modular monitor for use in Adult, Paediatric and Neonatal airway management
- Monitor should have TFT/LCD display with minimum resolution of 1920 X 1200 pixels.
- The monitor should have HDMI output port for connecting to a big screen which can display picture simultaneously on both screens.
- Monitor Should be user friendly with full touch screen operations.
- Monitor should be compatible to connect reusable and single use Video Laryngoscopes and Flexible intubation video endoscopes.
- Monitor should have two ports to connect two video scopes at same time and picture can be swapped using touch screen.
- Monitor should be chargeable, to be supplied with charger and should have facility to be used while charging.
- Integrated recording of Audio, Video and Still images should be possible on data card or USB drive with JPEG, MPEG, MP4 format which can be easily transferred to the computer/laptop.
- Documented videos & still images should be easily recalled/Playback on the monitor.
- Monitor should have Picture-in-Picture & side-by-side mode to view images from two different video scopes attached simultaneously (video laryngoscope and flexible video intubation scopes).
- Monitor should be splash proof according to IP 54 and should be shock resistant.
- Monitor should have lithium-Ion rechargeable batteries and run for at least 100 mins. when fully charged.

## Video Laryngoscopes - Reusable

- Required standard Macintosh video laryngoscopes with integrated chip-on-tip CMOS camera and LED for illumination with titanium handle.
- Blades and connection cable should be fully immersible in disinfecting solution.
- Blades should have a button for real time documentation.
- Blades can be sterilized using Sterrad and Steris system. Thermal disinfection up to 93 degrees and Chemo-thermal disinfection up to 65 degrees should be permissible.
- Blades should have anti-fogging mechanism.
- Should be supplied with Macintosh blade size 3 producing resolution of minimum 800p.
- Should be supplied with special hyper angulated adult blade for difficult intubation with channel for introduction of suction/oxygen catheter of size 16-18 Fr., angle of view of the blade should be 70 degree or more.
- Hyper angulated blade should be supplied with preformed atraumatic stainless-steel stylet from same manufacturer.
- Should be supplied with adult Magill Forceps from same manufacturer.

## Flexible Intubation Video Endoscope - Adult- Reusable

- It should be light weight, high resolution & portable reusable flexible scope.
- Integrated camera chip and LED light illumination

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

डा० अनिल कुमार वर्मा  
आचार्य  
एनेस्थीसियोलॉजी, इन्टेंसिव केयर  
एवं एम जेड विभाग  
जी.एस.पी.एस. मेडिकल कॉलेज  
लखनऊ

Prof. P. P. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Dr. Anis Sanjeev  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

- ET TUBE HOLDER should be a part of standard accessory of flexible scope and should be from same manufacturer.
- There should be 5cm interval markings on the scope.
- Set should include- Suction Adaptors (Disposable), Cleaning brush & Leakage tester as standard accessories along with hard carrying case

Scope should be suitable for following applications-

- Endotracheal Intubation
- Bronchoscopy
- Foreign body removal
- Bronchial Lavage
- Inspection of the Airways
- Dilatation Tracheotomy

Technical Details of Flexible Video Endoscope-

Tip deflection UP	140°-160°
Tip deflection DOWN	140°-160°
Angle of view	100° or more
Distal Tip Outer Diameter	5.0 – 5.5 mm
Working Channel diameter	2.0 – 2.5 mm
Working Length	650 mm or more
Total length	940 mm or more

#### Flexible Intubation Video Endoscope- Pediatric – Disposable

- It should be light weight, high resolution & disposable flexible scope
- Integrated camera chip and LED light illumination
- Should have built-in ET TUBE holder
- Each scope should be supplied in a separate sterile packing and ready for use

Scope should be suitable for following applications-

- Endotracheal Intubation
- Bronchoscopy
- Foreign body removal
- Bronchial Lavage
- Inspection of the Airways
- Dilatation Tracheotomy

Technical Details of Flexible Video Endoscope-

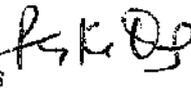
Tip deflection UP	180° or more
Tip deflection DOWN	180° or more
Angle of view	90° or more
Distal Tip Outer Diameter	3.0 – 3.5 mm
Working Channel diameter	1.0 – 1.5 mm
Working Length	650 mm or more

#### Secondary Monitor

- Should be supplied with Full HD secondary monitor 20 inches or more with an HDMI or DVI port to visualize the image simultaneously on both the screens.

  
Prendera Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. P.K. Das  
Assoc. Professor  
Dept. of Emergency Medicine  
Dr. RMLIMS, Lucknow

Trolley

- Modular, ergonomic and compact trolley with 4 dual wheels and locking brakes for easy manoeuvring and secure positioning.
- The trolley should be able to hold both the Monitors, Video laryngoscope blades and scope holder to hang two flexible video intubation scopes with 3 lockable drawers to keep the accessories.

Sterilization Tray

- Compatible tray from same manufacturer for sterilization of at least 2 video laryngoscopes at same time.

Certificates

- All quoted items should be from the same manufacturer (except secondary monitor) for total system compatibility and optimal system performance.
- Secondary monitor of 20 inch or more can be from other manufacturer of reputed make.
- Demonstration of the complete system is must before finalization of opening finance bid.
- The system should be USFDA / European CE certificate with 4 digits from notified body.
- IEC-60601-1/60601-2
- OEM must have ISO 13485:2016-certified service process in India

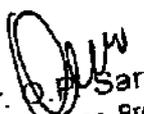
Scope of Supply

- Monitor - 1 No.
- Macintosh size 3 Video laryngoscope blade - 1 No.
- Hyper-angulated Video laryngoscope blade - 1 No.
- Connecting Cable - 1 No.
- Stylet - 1 pkt.
- Magill Forceps – Adult Reusable – 1 No.
- Flexible Intubation Video Endoscope – Adult Reusable - 1 No.
- Flexible Intubation Video Endoscope – Paediatric Disposable – 1 pkt.
- Secondary Monitor – 1 No.
- Trolley – 1 No.
- Sterilization tray for video laryngoscope – 1 No.

Note: Price of every accessories should be quoted separately which will be freezed for 5 years.

 Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

  
डा० अनिल कुमार  
असिस्टेंट प्रोफेसर  
एनेस्थीसियोलॉजी, डिपार्टमेंट ऑफ  
एंडेमिक्स मेडिसिन  
जी.एस.जी.एम. मेडिकल कॉलेज  
कानपुर

  
Dr. P. Sanjay  
Assoc. Prof.  
Dept. of Emergency  
SGPGIMS, Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**Optional Items and accessories**

1. Macintosh size 4 Video Laryngoscope blade- Reusable – 6 Lacs
2. Macintosh size 2 Video Laryngoscope blade- Reusable – 6 Lacs
3. Macintosh size 0 Video Laryngoscope blade- Reusable – 6 Lacs
4. Miller size 0 Video Laryngoscope blade- Reusable – 6 Lacs
5. Miller size 1 Video Laryngoscope blade- Reusable – 6 Lacs
6. Miller size 2 Video Laryngoscope blade- Reusable – 6 Lacs
7. Hyper angulated video laryngoscope Paediatric- Reusable with stellate – 6.5 Lacs
8. Connecting Cable- Reusable – 80,000/-
9. Protection Cap- Reusable – 7,000/-
10. Flexible Intubation Video Endoscope – Adult 5.5 mm Reusable – 17 Lacs
11. Flexible Intubation Video Endoscope – Neonatal Reusable – 16 Lacs
12. Flexible Intubation Video Endoscope – Paediatric Disposable – 50,000/- (Per scope)
13. Flexible Intubation Video Endoscope – Adult Disposable – 50,000/- (Per scope)
14. Magill Forceps – Paediatric – Reusable – 16,000/-

 Dr. Jitendra Singh Chahar,  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

  
डा० अनिल कुमार वर्मा  
आचार्य  
एनेस्थेसियोलॉजी, इन्टिवेनस केंद्र  
एवं पेन मेडिसिन  
जी.एस.वी.एम. मेडिकल कॉलेज  
कानपुर

  
Dr. O.P. Sanjeev  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Integrated Difficult Airway Cart

### Monitor – 8 inch

- Full HD 8-inch High-end Modular monitor for use in Adult, Paediatric and Neonatal airway management
- Above monitor should be TFT/LCD display with minimum resolution of 1920 X 1200 pixels.
- The monitor should have HDMI output port for connecting to a big screen which can display picture simultaneously on both screens.
- Monitor Should be user friendly with full touch screen operations.
- Monitor should be compatible to connect reusable and single use Video Laryngoscopes and Flexible intubation video endoscopes.
- Monitor should have two ports to connect two video scopes at same time and picture can be swapped using touch screen.
- Monitor should be chargeable, to be supplied with charger and should have facility to be used while charging.
- Integrated recording of Audio, Video and Still images should be possible on data card or USB drive with JPEG, MPEG, MP4 format which can be easily transferred to the computer/laptop.
- Documented videos & still images should be easily recalled/Playback on the monitor.
- Monitor should have Picture-in-Picture & side-by-side mode to view images from two different video scopes attached simultaneously (video laryngoscope and flexible video intubation scopes).
- Monitor should be splash proof according to IP 54 and should be shock resistant.
- Monitor should have lithium-Ion rechargeable batteries and run for at least 100 mins. when fully charged.

### Secondary Monitor

- Should be supplied with Full HD/4K secondary monitor 20 – 27 inches or more with an HDMI or DVI port to visualize the image simultaneously on both the screens.

### Video Laryngoscopes - Reusable

- Required standard Macintosh video laryngoscopes with integrated chip-on-tip CMOS camera and LED for illumination with titanium handle.
- Blades and connection cable should be fully immersible in disinfecting solution.
- Blades should have a button for real time documentation.
- Blades can be sterilized using Sterrad and Steris system. Thermal disinfection up to 93 degrees and Chemo-thermal disinfection up to 65 degrees should be permissible.
- Blades should have anti fogging mechanism.
- Should be supplied with Macintosh blade size 3 producing resolution of minimum 800p.
- Should be supplied with special hyper angulated adult blade for difficult intubation with channel for introduction of suction/oxygen catheter of size 16-18 Fr., angle of view of the blade should be 70 degree or more.

Dr.endra Singh  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.C.A.M.S., Lucknow

डा० श्रीराम कुमार वर्मा  
आचार्य  
एनेस्थीसियोलॉजी, मेडिकल केंद्र  
एच वैन मेडिसिन  
जी.एस.बी.एम. मेडिकल कॉलेज  
कानपुर

Dr. O.P. Singh  
Assoc Professor  
Dept. of Emergency Medicine  
S.G.P.C.A.M.S., Lucknow  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

- Hyper angulated blade should be supplied with preformed atraumatic stainless-steel stylet from same manufacturer.
- Should be supplied with adult Magill Forcep from same manufacturer.

#### Flexible Intubation Video Endoscope – Adult 5.5 mm- Reusable

- It should be light weight, high resolution & portable reusable flexible scope.
- Integrated camera chip and LED light illumination
- ET TUBE HOLDER should be a part of standard accessory of flexible scope and should be from same manufacturer.
- There should be 5cm interval markings on the scope.
- Set should include- Suction Adaptors (Disposable), Cleaning brush & Leakage tester as standard accessories along with hard carrying case

Scope should be suitable for following applications-

- Endotracheal Intubation
- Bronchoscopy
- Foreign body removal
- Bronchial Lavage
- Inspection of the Airways
- Dilatation Tracheotomy

Technical Details of Flexible Video Endoscope-

Tip deflection UP	160°-180°
Tip deflection DOWN	140°-160°
Angle of view	100° or more
Distal Tip Outer Diameter	5.0 – 5.5 mm
Working Channel diameter	2.0 – 2.5 mm
Working Length	650 mm or more
Total length	940 mm or more

#### Flexible Intubation Video Endoscope- Pediatric – Reusable

- It should be light weight, high resolution & portable reusable flexible scope.
- Integrated camera chip and LED light illumination
- ET TUBE HOLDER should be a part of standard accessory of flexible scope and should be from same manufacturer.
- There should be 5cm interval markings on the scope.
- Set should include- Suction Adaptors (Disposable), Cleaning brush & Leakage tester as standard accessories along with hard carrying case

Scope should be suitable for following applications-

- Endotracheal Intubation
- Bronchoscopy
- Foreign body removal
- Bronchial Lavage
- Inspection of the Airways
- Dilatation Tracheotomy

Dr. Ajendra Singh Chahar  
Assistant Professor  
Department of Anaesthesiology  
SGPGIMS, Lucknow

डा० अजय कुमार वर्मा  
आचार्य  
एनेस्थीसियोलॉजी, मिडिकल सेंटर  
एवं हेम मेडिसिन  
जी.एस.वी.एम. मेडिकल कॉलेज  
कानपुर

Dr. O. P. Sanjeev  
Assoc. Profess  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

### Technical Details of Flexible Video Endoscope-

Tip deflection UP	140° or more
Tip deflection DOWN	140° or more
Angle of view	100° or more
Distal Tip Outer Diameter	3.5 – 4.0 mm
Working Channel diameter	1.0 – 1.5 mm
Working Length	650 mm or more
Total length	930 mm or more

### Trolley

- Modular, ergonomic and compact trolley with 4 dual wheels and locking brakes for easy manoeuvring and secure positioning.
- The trolley should be able to hold both the Monitors, Video laryngoscope blades and scope holder to hang two flexible video intubation scopes with 3 lockable drawers to keep the accessories.

### Sterilization Tray

- Compatible tray from same manufacturer for sterilization of at least 2 video laryngoscopes at same time.

### Certificates

- All quoted items should be from the same manufacturer (except secondary monitor) for total system compatibility and optimal system performance.
- Secondary monitor of 20 inch or more can be from other manufacturer of reputed make.
- Demonstration of the complete system is must before finalization of opening finance bid.
- The system should be USFDA / European CE certificate with 4 digit from notified body.
- IEC-60601-1/60601-2
- OEM must have ISO 13485:2016 certified service process in India.

### Scope of Supply

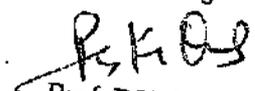
- Monitor - 1 No.
- Macintosh size 3 Video laryngoscope blade - 1 No.
- Hyper-angulated Video laryngoscope blade - 1 No.
- Connecting Cable - 1 No.
- Stylet - 1 pkt.
- Magill Forcep – Adult Reusable – 1 No.
- Flexible Intubation Video Endoscope – Adult 6.5 mm Reusable - 1 No.
- Flexible Intubation Video Endoscope – Pediatric Reusable – 1 No.
- Secondary Monitor- 1 No.
- Trolley – 1 No.
- Sterilization tray for video laryngoscope – 1 No.

Note: Price of every accessories should be quoted separately which will be freezed for 5 Years.

  
Dr. Jitendra Singh Chandra  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

  
डा० प्रो. पी.के. दास  
अध्यक्ष  
एनेस्थीसियोलॉजी, सिटिकल कैर  
एवं एम. मेडिसिन  
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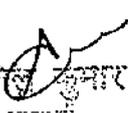
  
Dr. O.P. Sanjeev  
Assoc. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

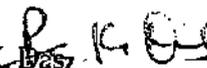
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**Dr. Jitendra Singh Chahar**  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
**डा० अनिल कुमार वर्मा**  
 अध्यक्ष  
 एनेस्थीसियोलॉजी की, त्रिचिकित्सक केंद्र  
 एवं देव मेडिसिन  
 जी.एस.वी.एम. मेडिकल कॉलेज  
 कानपुर

  
**Dr. O.P. Singh**  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 S.G.P.G.I.M.S., Lucknow

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## Neuromuscular Monitor

- 1) It should generate several modes of Neuromuscular Stimulation such as :
  - a) TOF (Train Of Four)
  - b) PTC (Post Tetanic Count)
  - c) TOF plus PTC
  - d) DBS (Double Burst) (3, 3) (3, 2) (2, 3)
  - e) ST (Single Twitch) 0.1 Hz and 1 Hz
  - f) TET (Tetanus 50 Hz)
- 2) TOF scan's 3D accelerometer produces measurements from the induced muscle responses:
  - g) TOF%: T4/T1
  - h) TOF%: T4/Tref
  - i) PTC: Number of responses detected
- 3) The Monitor should display TOF scan measurements and visual alarms such as :
  - a) TOF-Ratio, TOF- Count, Single Twitch and PTC
  - b) Countdown time bar for TOF Count/ TOF
  - c) Mini- trend chart
- 4) Should have Inbuilt high- capacity Lithium- Ion battery
- 5) The robust materials of the monitor, accelerometer and cables will hold up to common hospital cleaning and disinfecting agents.

### Certifications:

- 1) Equipment should have IEC Conformity Certifications
- 2) Equipment should have US FDA/ European CE, ISO 13485:2026 & ISO 9001:2015 Certificate.
- 3) Equipment should have IEC conformity, ISO 13485:2016 & ISO 9001:2015 certification.

### Scope of Supply :

Complete Set including Monitor Module, Accessories & Battery, as per the Quantity as mentioned in Tender.

  
 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

  
 डा० अनिल कुमार शर्मा  
 अध्यक्ष  
 एनेस्थीसियोलॉजी, मिडिकल केंद्र  
 एवं पैन मेडिसिन  
 जी.एस.वी.एम. मेडिकल कॉलेज  
 कानपुर

  
 Dr. J. Sanje  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## MRI compatible Anesthesia machine

1. Should be three gas Anesthesia machine for use in MR environments in operating, induction and recovery rooms. It should be able to use in MRI scanner rooms with magnets of 1.5 tesla and 3 tesla by a fringe field strength of 40mtesla or above. (40mtesla = 400 gauss)
2. Should have an integrated ventilator for adult to infants and integrated color TFT display for airway pressures, volume and oxygen monitoring.
3. The machine should be suitable for low and minimal flow anesthesia application with compliance compensation of breathing circuit; fresh gas flow compensation/ decoupling.
4. Should have precise digital fresh gas settings of Air, N<sub>2</sub>O and O<sub>2</sub>, with a total fresh gas flowmeter for indication and virtual display on screen
5. The anesthesia- machine; inbuilt ventilator-and vaporizer should be manufactured by same — company to maintain uniformity of part and efficient after sale service
6. The machine should have trolley with central brake and 3 drawers with at least one with lock.
7. The system should have minimum 45 Min. battery backup
9. The manufacturer should provide compatibility certification for MRT system

### 10. Gas delivery system

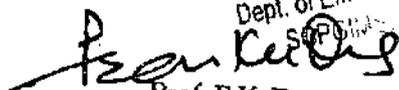
- Should have pin index yokes for Oxygen & Nitrous Oxide besides separate connection for Central gas supply for Oxygen, Nitrous Oxide and Air.
- The machine should have pressure gauges for cylinders & central supply lines mounted on front of Anesthesia machine for better visibility. The gas connections should be non-interchangeable.
- The system should be suitable to use at minimal flow up to 700ml fresh gas setting.
- Automatic cutoff of N<sub>2</sub>O by Oxygen pressure failure.
- Hypoxic guard for linear regulation of minimum oxygen concentration at 23% volume and must ensure a minimum Oxygen flow of 200 ml at low fresh gas flow settings even below total 500 ml fresh gas flow
- Audible visual oxygen failure alarm.
- Emergency Oxygen flush at 30 — 70 L/min bypassing the vaporizer.
- Should have auxiliary oxygen flowmeter
- In the event of complete power loss and battery failure it shall be possible to manually ventilate and deliver anesthetic agent.

### 11. Vaporizer

- Machine should have possibility to mount two quick mount type vaporizers for easy interchangeability, and safety.
- Should be provided with a Temperature / pressure compensated and flow independent Vaporizer for Isoflurane & Sevoflurane.
- Vaporizer should have extended delivery range from 0 to 6 Vol. %
- The vaporizer should require no calibration in its lifetime.

  
Dr. Jitendra Singh Chahar,  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

  
डा० अनिल कुमार वर्मा  
आचार्य  
एनेस्थीसियोलॉजी, क्लिनिकल केमिस्ट्री  
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लखनऊ

  
Dr. P.K. Das  
Ass. Prof. & Head  
Dept. of Emergency Medicine  
S.G.P.G.I.M.S., Lucknow  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## 12. Breathing System

- Should have fresh gas de-coupled semi closed circle absorber system.
- Should have adjustable pressure relief valve from 5 to 75 mbar.
- Should have change over from Spontaneous to Bag ventilation with single step.
- The system should have leak and compliance test (including patient hoses up to the Y piece).
- Should have optimized absorber canister approx. 1.5 Liter.
- Should have an external fresh gas outlet for connecting Magill or Bain's circuit
- The device should have port for anesthesia gas scavenging system.

## 13. Integrated Anesthesia Ventilator

- The system should have inbuilt ventilator with electronically controlled and electrically/ pneumatically driven technology
- Should not require changing of bellows for adult & infants.
- Modes: Volume controlled, Manual/ Spont., Pressure controlled mode, Volume controlled mode, SIMV/PS and pressure support
- Tidal Volume: 20 ~ 1400 ml
- PEEP: 0 ~ 20 mbar
- Breathing Frequency :4 to 60 BPM
- I: E Ratio: 4:1 to 1:4
- Inspiratory pause =: 0—50% of Ti.
- Frequency 1 to 60 1/ min, I: E = 2:1 to 1:3.
- Should automatically compensate for Compliance of breathing system.
- Should be able to ventilate with atmospheric air, in case of missing gases.

## 14. Airway monitoring

- Integrated color screen of 6 inches or more for electronic monitoring and display of following parameters:
- FiO<sub>2</sub>
- Expiratory Tidal Volume
- Expiratory Minute volume
- PEEP, Peak & Mean and Plateau airway pressure
- Frequency
- Waveform display for Airway pressure.

## Alarm limits & alarms

- Should have two teslameter sensors detection and should alarm independently by 40mtesla (400 gauss)
- Machine should have two additional sets of alarm LED's integrated into top plate for viewing from distance
- Adjustable high / low limits with audio and visual alarms for the following:
- Minute volume,
- Airway pressure (incl stenosis and disconnect),

Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

डा० अजित कुमार वर्मा  
प्रचारक  
एनेस्थीसियोलॉजी, इन्टिग्रल कैर  
एंड पैन मैनेजिमेंट  
जी.एस.पी.एम. मेडिकल कॉलेज  
लखनऊ

Dr. O. P. Sanjeev  
Assoc Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

- Insp oxygen concentration,
- Audio power supply fail alarm,
- Fail to cycle warning.
- Machine should have RS 232 connectivity port

**Workstation should be supplied with MRI compatible monitor with following features –**

- Screen size  $\geq$  12 inch
- Parameters:
  - ECG
  - SPO2
  - NIBP
  - Respiration rate
  - Temperature

**Certifications:**

- ISO 9000/9001
- EN 60601-2-13
- US FDA/EU CE.

**Scope of supply**

- 3 gas Anesthesia machine.
- Trolley with 3 drawers
- Pin Index yokes for O2 & N2O
- Pipeline connections for all three gases
- Ventilator & monitor
- Semi closed breathing system
- MRI compatible disposable adult and neonatal breathing circuits — 25 nos.
- Vaporizers for Isoflurane & Sevoflurane
- Central gas supply hoses (Color coded)
- Instruction for use



Dr. Jitendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

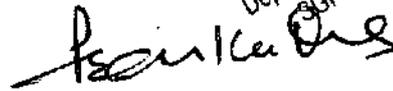
डा० जितेंद्र कुमार चहार

प्राध्यापक

सहस्योग्य विभाग, क्लिनिकल केन्द्र  
एवं पैस मेडिसिन  
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कानपुर



Dr. O.P. Sanjeev  
Assoc Professor  
Dept. of Emergency Medicine  
S.G.P.G.I.M.S., Lucknow



Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. R.M.I.M.S., Lucknow

## PORTABLE HANDHELD X-RAY MACHINE

1. Should be light weight Handheld Ultra-Portable X-ray Generator.
2. It should have Flat panel Digital Detector with instantaneous Image transfer as well as storage capabilities of not less than 200 Images.
3. It should have Acquisition and Image processing Software with all tools necessary for Image manipulation / adjustment and capability to stitch multiple images for combining different scans.
4. It should have suitable portable light weight Stand for X ray source for field / ICU / Ward / Ambulance carriage.
5. It should have wireless REMOTE CONTROL enabled X-Ray acquisition.
6. X Ray Generator weight should be light weight not more than 3 kg for ease of handling and operation
7. The Output Power ( $P=VI$ ) as per ALARA (As Low As Reasonably Achievable) must not be more than 250 watts to avoid higher radiation to ensure patient and operator safety
8. It should have suitable stand for Digital Detector.
9. Collimator should be inbuilt and should not require changing of collimator according to anatomy to avoid operator's error and to ensure patient safety
10. It should be supplied with customised carrying case suitable for all components of system in one case including source, detector, acquisition console by one person / operator.
11. It should have provision for neck strap and hand strap for better handling/safety of the equipment.
12. System should be capable of taking X-Rays of maximum human anatomies with minimal radiation exposure to patient / operator / attendants without compromising Image quality of different anatomies.
13. The voltage & current of the X-Ray tube must not be higher than 80kV & 3 mA.
14. The system should have selectable exposure time from as low as possible upto 2 Sec to allow X-Ray images of all body weights and different anatomies to be taken.
15. The Focal spot size of the source should not exceed 0.5 mm for high quality images.
16. The X-Ray source should have lead impregnated shielding on all sides other than the radiation aperture to safeguard operator from scattered X-rays.
17. The source must have a guide beam to help ascertaining the X-Ray Image area which is visible at day light also.
18. The source should have digital display to show critical parameters like battery charge, tube voltage exposure time etc.
19. The system should come with a large detector of at least 350 X 400 mm for

*[Signature]*  
**Dr. Jitendra Singh**  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow.

डा० अनिल कुमार वर्मा  
 एनेस्थीसिस्ट, मिडिकल कैंपस  
 एच० पी० जेड  
 जी.एस.वी.एम. मेडिकल कॉलेज  
 काजपुर

*[Signature]*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

*[Signature]*  
**Dr. O.P. Singh**  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

taking images of all body parts.

- 20. The detector must be high resolution with atleast 2500 X 3000 pixels and less than 150microns pixel pitch.
- 21. The detector should be capable of placement either in a bucky or directly under the patient if needed and must have load bearing capabilities of at least 200 Kg at any single point.
- 22. The detector must be solid state, sealed, water resistant, dust resistant.
- 23. The detector must have wireless image transfer to enable central acquisition workstation placement, while images can be taken of any patient across the room.
- 24. The acquisition console should be user friendly and based on windows OS.
- 25. Acquisition console software should have different selectable settings for patient type (adult/paediatric/obese) & anatomy view (anterior, posterior, oblique, lateral).
- 26. Acquisition software should be compatible with PACS/DICOM and provide highquality jpeg / png easily transmissible over platforms like WhatsApp / Emails.
- 27. The software should have settings for Automatic / Manual contrast and brightness optimization.
- 28. The Acquisition software Should be user friendly, DICOM / HL7 reference standard compatible for Telemedicine. PACS compatible for Hospitals.
- 29. The complete system including X-Ray source, detector, acquisition station and routers should have capability of running without electricity on internal batteries which should be rechargeable using normal 220V-240 VAC / 6 Amp sockets.
- 30. The dimension of the X Ray source should not be more than 180-200(L)×180-200(H)×150-180(D) for easyhandling.
- 31. The complete setup should be able to take at least 100 Images without the need of recharging. Any spare batteries needed to achieve this should be supplied along with the system.

**Certifications:**

- 1. The system ie X-ray Source and Detector both must have one of the certifications USFDA/CE / BIS equivalent certification.
- 2. X-ray Source must be AERB and CDSCO approved and must have been manufactured in ISO 13485 certified manufacturing setup.

*[Signature]*  
**Scope of Singh Chahar**  
 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow.

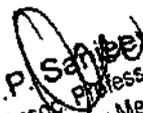
डा० अजय कुमार वर्मा  
 अध्यक्ष  
 एनेस्थीसियोलॉजी, इमिजिनाल केयर  
 एवं एम. मेडिसिन  
 जी.एस.पी.एस. मेडिकल कॉलेज  
 लखनऊ

*[Signature]*  
 Dr. U.P. Sanjay  
 Assoc Professor  
 Dept. of Emergency Medicine  
 S.G.P.G.I.M.S., Lucknow  
*[Signature]*  
 Prof. P.R. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

1. Source (X-Ray Generator)
2. Flat Panel Detector
3. Acquisition console (Laptop)
4. Tripod Stand for source and detector for universal frame
5. Wireless REMOTE CONTROL for distant operation & safety of operator
6. Soft Bag Pack for carrying the complete system.

डा० अमित कुमार वर्मा  
 अध्यक्ष  
 एनेस्थीसियोलॉजी, क्लिनिकल केयर  
 एवं सैव अस्पिटल  
 जी.एस.पी.एम. मेडिकल कॉलेज  
 लखनऊ

  
 Dr. Jitendra Singh Chahar  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.C.P.G.I.M.S., Lucknow

  
 Dr. O.P. Sanjay  
 Assoc. Professor  
 Dept. of Emergency Medicine  
 SGP GIMS, Lucknow  
 SGP GIMS, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## ABG MACHINE

- Should be Fully Automatic machine with upgradeable facility.
- It should be able to measure pO<sub>2</sub>, pCO<sub>2</sub>, pH, Na<sup>+</sup>, K<sup>+</sup>, Cl<sup>-</sup>, Ca<sup>++</sup>, Hct, Co-oximetry - Hemoglobin derivatives (HHb, O<sub>2</sub>Hb, COHb, Met Hb), Glucose, Lactate, Urea (BUN) Bilirubin(neonatal) and Barometric pressure in one single machine with single aspiration.
- Measurement of Hb derivatives with a CCD based Polychromator system
- Calculated parameters which includes BE, BE<sub>ecf</sub>, BB, AG, HCO<sub>3</sub><sup>-</sup>, tCO<sub>2</sub>, stHCO<sub>3</sub><sup>-</sup>, stpH, SO<sub>2</sub>, ctO<sub>2</sub>, aH<sup>+</sup>, AaDO<sub>2</sub> etc.
- Parallel measuring chambers for ABG, Electrolytes, & metabolites to save reagents.
- Should have Stat individual module on/off facility to save the reagents as well as sample volume.
- Maintenance free electrodes.
- Fully automatic calibration system for all the parameters.
- Continuous reagent level monitoring with graphic display.
- Data display on well illuminated LCD color display with active touch screen and printout on a fast, low noise graphical thermal printer.
- Storage facility of measured data in case of power failure.
- Built in data storage facility for atleast 10,000 patient results.
- Built in voltage stabilizer for the range of 100 – 240 V / 50 Hz with 601-1 compliance
- Should be able to process sample types of whole blood, serum, plasma, dialysate and aqueous solution.
- Running cost of per test should be in decreasing mode.

### Certifications:

- US FDA / CE

Dr. O. P. Sanjeev  
Asst. Professor  
Dept. of Emergency Medicine  
SGPGIMS, Lucknow

Dr. Jyendra Singh Chahar  
Assistant Professor  
Department of Critical Care Medicine  
S.G.P.G.I.M.S., Lucknow

डा० अमित कुमार वर्मा  
सहायक  
एनेस्थीसियोलॉजी, इंटिग्रल मेडिकल  
एवं पैलियेटिव  
जी.एस.टी.एम. मेडिकल कॉलेज  
काशीपुर.

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

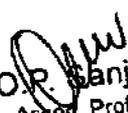
## INTRAOSSUEOUS ACCESS DEVICE

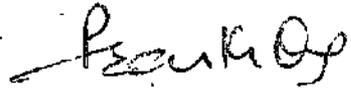
Single Use Sterile Intraosseous Access Device: for emergency vascular access for adult and pediatric patients.

Parameter Description	Specifications		
	Pediatric 15	Adult 25	Adult 45
Variants			
Needle Length	15mm	25mm	45mm
Needle Gauge	16 G	16 G	16 G
Infusion Ports	Hollow bore needle with side ports/holes		
Needle Material	Biocompatible SS 304 with transparent Hub		
Trocar	Multipoint cutting edges with spiral flutes		
Trocar Material	Trocar- Stainless steel (SS420J2 / Bioline 4C27A or alternative) with transparent Hub		
Driver Unit	Integrated torque driver unit with Needle and Trocar assembly		
Driver Unit Material	Combination of Poly Propylene, ABS, PDM		
Overall Device Dimensions	Max width less than 50 mm and length less than 200 mm		
Use Case	Single Use, Disposable		
Device weight	Approx. 55 ± 10 gms		
Luer connectors	Compatible with standard Luer Lock Connectors		
Insertion Sites	Proximal tibia Distal tibia Proximal humerus Distal Femur	Proximal tibia Distal tibia Proximal humerus	
Insertion process and operating force	Manual rotational insertion with torque driver		
Operating Procedure	Manual rotational insertion with torque driver		
Biocompatibility	The Device is made up of <i>Bio compatible materials</i>		
Sterilization	Pre-sterile, Ethylene Oxide sterile		
Certifications	ISO		

  
**Dr. Jitendra Singh Chahar**  
 Assistant Professor  
 Department of Critical Care Medicine  
 S.G.P.G.I.M.S., Lucknow

डा०  कुमार  
 अध्यक्ष  
 एम्बुलेंस सेवा, सिकंदर कैंसर  
 एवं रोग निवारण  
 जी.एस.जी.एम. मेडिकल कॉलेज  
 लखनऊ

  
**Dr. O.P. Sanjeev**  
 Asson. Professor  
 Dept. of Emergency Medicine  
 SGPGIMS, Lucknow

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCU  
 Dr. RMLIMS, Lucknow

**CSSD**



**related to Department of CSSD by committee members**

SR. NO.	NAME OF EQUIPMENT	GO NUMBER	APPROX. COST
1.	DRYING CABINET	GO-28-JAN-18SUCHI-2	2,50,000.00
2.	ETO STERILIZER	GO-7-DEC-2022	(OVEN 250LTS) 50,00,000.00 (8CUFT)
3.	GAUZE CUTTING MACHINE WITH SS TABLE	GO-28-JAN-18SUCHI-2	1,80,000.00 (900 X 600 X 900mm)
4.	OT FUMIGATOR (BASIC)	GO-23-AUG-18SUCHI-4	28,000.00
5.	PLASMA STERILIZER (TABLE TOP)	GO-7-DEC-2022	NA
	PLASMA STERILIZER TABLE TOP - LOW TEMPERATURE HYDROGEN PEROXIDE	GO-7-DEC-2022	NA
6.	SPRAY GUN RINSER FOR AIR AND WATER	GO-28-JAN-18SUCHI-2	1,40,000.00
7.	STEAM STERILIZER	GO-28-JAN-18SUCHI-2	38,00,000.00 (sliding double door)
	STEAM BOILER SYSTEM FOR STEAM STERILIZER: CAPACITY: SUITABLE FOR 1000 LTR. STEAM STERILIZER		
8.	ULTRASONIC CLEANER	GO-28-JAN-18SUCHI-2	2,00,000.00
9.	WASHER DISINFECTER	GO-28-JAN-18SUCHI-2	25,00,000.00 (inclusive of accessories, double door)
10.	WORKTABLE WITH DOUBLE SINK	GO-28-JAN-18SUCHI-2	2,50,000.00 (2400x650x900)
11.	BIG BASKET (MODULAR STERILIZING)	GO-28-JAN-18SUCHI-2	10,000.00
12.	MEDIUM BASKET (MODULAR STERILIZING)	GO-28-JAN-18SUCHI-2	8,000.00
13.	TAPE DISPENSER(MULTI ROLL)	GO-28-JAN-18SUCHI-2	10,000.00
14.	BASKET RACK FOR CSSD	GO-28-JAN-18SUCHI-2	2,00,000.00
15.	OPEN STORAGE RACK	GO-28-JAN-18SUCHI-2	2,00,000.00
16.	PASS THROUGH CABINET	GO-28-JAN-18SUCHI-2	4,50,000.00 (dynamic pass box with hepa filter)
17.	RO PLANT FOR CSSD	GO-28-JAN-18SUCHI-2	11,50,000.00 (1000 lph with 2000lts storage)
18.	SMALL STEAM STERILIZER (VERTICAL AUTOCLAVE 100 LITRES)	GO-28-JAN-18SUCHI-2	2,50,000.00
19.	WIRE STORAGE SHELF MODULE (DIRTY/CLEAN AREA)	GO-28-JAN-18SUCHI-2	8,000.00 (WIRE BASKET S.S)
20.	ELECTRIC STEAM BOILER	GO-23-AUG-18SUCHI-4	NA
21.	CENTRIFUGE	GO-23-AUG-18SUCHI-4	8,00,000.00 (EPPENDORF) 15/50ml
22.	PLASMA STERILIZER-LOW-TEMPERATURE HYDROGEN PEROXIDE	GO-28-JAN-18SUCHI-2	NA
23.	PLASMA STERILIZER TABLE TOP-	GO-28-JAN-18SUCHI-2	NA

*Manodeep Sen*  
Professor  
Department of Microbiology  
R.M.L.I.M.S., Lucknow

*Dr. Manodeep Sen*  
Professor  
Department of Microbiology  
R.M.L.I.M.S., Lucknow

*Dr. Sunil Kr. Singh*  
Additional Professor  
Department of General Surgery  
R.M.L.I.M.S., Lucknow

*Prof. P.K. Das*  
Professor & Head  
Dept. of Anaesthesiology & CCM  
R.M.L.I.M.S., Lucknow



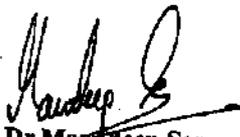
**Declaration Certificate about Technical Specifications  
related to Department of CSSD by committee  
members**

	LOW-TEMPERATURE HYDROGEN PEROXIDE		
24.	AUTOCLAVE	GO-28-JAN-18SUCHI-2 GO-7-DEC-2022	25,00,000.00 (HORIZONTAL MANUAL 1000LTS)
25.	GAS CHROMATOGRAPHY	GO-23-AUG-18SUCHI-4	30,00,000.00 (Shimadzu)
26.	SINGLE DOOR STEAM STERILIZER	GO-28-JAN-18SUCHI-2 GO-7-DEC-2022	25,00,000.0 HORIZONTAL MANUAL 1000LTS)
27.	DOUBLE DOOR STEAM STERILIZER	GO-28-JAN-18SUCHI-2 GO-7-DEC-2022	28,00,000.00 HORIZONTAL D.DOOR MANUAL 1000LTS)
28.	CHEST IRONER	GO-28-JAN-18SUCHI-2	NA
29.	HEAT SEALING MACHINE	GO-28-JAN-18SUCHI-2	50,000.00
30.	DOCUMENTATION LABELLER	GO-28-JAN-18SUCHI-2	NA
31.	PASS BOX	GO-28-JAN-18SUCHI-2	4,50,000.00 (Dynamic with heap filter)
32.	STERILIZATION CONTAINER	GO-23-AUG-18SUCHI-4	7,500.00
33.	ULV FOGGER	GO-23-AUG-18SUCHI-4	NA

This is to certify that technical specification of all the above-mentioned machine/instruments, approved by the technical committee is not of any specific company. The technical features of the equipment/instruments from all reputed firms in the current market have been included in this specification to the best of my knowledge and belief & in the opinion of the technical committee.

The technical specification duly signed by the technical committee members is attached herewith.

  
**Dr. Sunil Kumar Singh**  
Professor (JG)  
Department of General Surgery  
DR RMLIMS, Lucknow

  
**Dr. Manojdeep Sen**  
Professor  
Department of Microbiology  
DR RMLIMS, Lucknow

  
**Prof. P.K. Das**  
Chairman  
Technical specifications committee  
Clinical Subjects & others  
Head, Department of Anesthesiology & CCM  
DR RMLIMS, Lucknow

**DRYING CABINET**

**Drying Cabinet with Single Door Equipment** : Drying Cabinet with Single Door  
**Quantity** : 1  
**Volume** : 250 Litre  
**Design** : Drying timer controlled drying cabinet with single door  
The system has adjustable temperature range of 60-90C  
The system has drying time range of 0-90 minutes  
Suitable for electrical operation on 230 volts, single phase, 15.Amps. having Electric load of 3.6 KW  
It has Single door  
**Material of Construction** : SS 304



Dr. Sunil Kr. Singh  
Additional Professor

Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow



Dr. Manodeep Sen  
Professor

Department of Microbiology  
Dr. R.M.L.I.M.S., Lucknow



Prof. F.K. Das  
Professor & Head

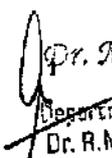
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

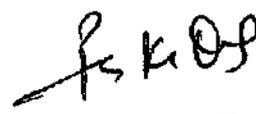
# ETO STERILIZER

129

<b>Machine</b>	:	Gas Sterilizer
<b>Type</b>	:	ETO Sterilizer
<b>Sterilizing Temperature</b>	:	Minimum: As per user setting Maximum: 60°C
<b>Chamber Size</b>	:	450 mm x 450 mm x 900mm
<b>Doors</b>	:	Single Hinged Door
<b>Material of Construction</b>	:	Chamber: SS 304 Non-Contact Parts: SS 304 Insulation: 50 mm thick Mineral Wool Piping: SS 304 Door: SS 304 Door Sealant: High Grade Silicon Gasket
<b>Finish</b>	:	Internal: Mirror External: Matt
<b>The equipment has smooth finish and is manufactured without any sharp edges or crevices</b>		
<b>Machine Operation Control</b>	:	By Programmable Logic Controller (PLC) make Allen Bradley
<b>Machine operational interface</b>	:	By Pre-programmed HMI touch screen make Allen Bradley
<b>Process Control and Other Features</b>		
<b>Cylinder based Sterilization Pressure (range)</b>	:	0.1 to 1 bar
<b>Cylinder based Sterilization Temperature (range)</b>	:	Minimum: Room temperature Maximum: 60° C
<b>Cartridge based Sterilization Pressure (range)</b>	:	Range: -0.4 to -0.8 bar
<b>Cartridge Temperature and Cycle information</b>	:	At least 3 Pre-set Programmable Cycles to be provided Minimum: 5 degree above room temperature Maximum: 60° C
<b>Sterile Hold Time</b>	:	Minimum: 300 min. Maximum: As required
<b>Vacuum setting (Range)</b>	:	Range: -0.4 to -0.7
<b>Cycle Information</b>	:	Fully automatic operation. Negative Pressure Cycle (100% ETO Cartridge) Cycle description: 1) Vacuuming of chamber to set value 2) Leak hold period

  
Dr. Sunil Kr. Singh  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Manojdeep Sen  
Professor  
Department of Microbiology  
Dr. R.M.L.I.M.S., Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

- 3) Cartridge punching /gas purging depending on the cycle selected.  
4) Sterilization hold period for set time.  
5) Exhaust and aeration for no. of aeration pulses set.

The machine is equipped with positive pressure mechanical door locking system which does not allow the user to open the door until the atmospheric pressure is achieved inside the chamber

The machine is equipped with inbuilt steam generator

The machine is able to maintain humidity in the chamber within the range of 90 to 95% automatically controlled by wet and dry humidity transducer system

Pressure of the sterilant is controlled automatically through pressure sensor and pneumatically controlled valves

The machine is able to automatically control the aeration phase of the cycle to remove residual gas from the chamber

The Sterilizer has Hinged Double Door with Shooting bolts locking system  
Door frame is strong & robust enough to ensure smooth door movement & consistency in alignment

Door opening safety:

Door has dual safety lock, one mechanical and one electronic locking mechanism  
Catalytic convertor is provided to treat the ETO gas before draining

Vacuum Pump is provided

#### OTHER SAFETY FEATURES

Machine is provided with overload safety relay

An easily accessible emergency stop is provided on main control panel door

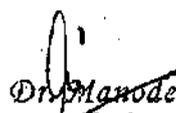
The sterilizer is hydraulically tested at 2.5 times the working pressure

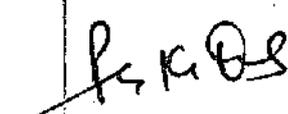
The sterilizer has safety valve for added safety

#### Certifications:

- European CE Standard
- The Sterilizer Electrical Wiring is completely safe and follows the following electrical standard:
  - IEC 60601-1-2016
  - IEC 60601-1-2
  - IEC 61010-2
  - ISO 9001:2015, ISO 13485:2016, WHO GMP

  
Dr. Sunil Kumar Singh  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Manodeep Sen  
Professor  
Department of Microbiology  
Dr. R.M.L.I.M.S., Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

### Gauze Cutting Machine with SS Table

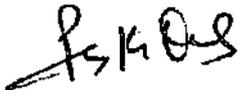
**Size** : Overall size: 1050mm x 650 mm x 750mm  
**Description and construction** : SS 304 - 16 Gauge Table  
Cutting capacity: 165 mm, Net weight: 16.0 kg,  
Power: 220-240 V/0.75 HP / Single Phase.



Dr. Sunil Kr. Singh  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow



Dr. Manodzeep Sen  
Professor  
Department of Microbiology  
Dr. R.M.L.I.M.S., Lucknow



Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. R.M.L.I.M.S., Lucknow

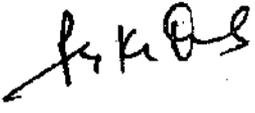
**OT Fumigator (Basic)**

Ultra Low Volume Fogger should have the following features:

- It should convert the aerial disinfectant being used into nearly invisible droplets of particle size 0.1 -10 microns.
- The throw of generated particles should be up to 15 feet
- Should be suitable for 100 ~ 1,000 square feet
- Should be made of corrosion proof, durable glass filled nylon
- Should be Compatible with all types of water based disinfectants including acidic, alkaline, oxidizing, quaternary ammonium based, peroxide and silver nitrate combination
- Nozzle should be made of SS316
- Should have an integrated air intake filter
- Should have an integrated reservoir filter
- The tank should be made of HDPE and the capacity should be >6Lit
- Disinfectant Level should be visible in the tank
- Timer of 0-60 minutes should be integrated with the fogger body.

  
 Dr. Sumil Kr. Singh  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
 Dr. Manodeep Sen  
 Professor  
 Department of Microbiology  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

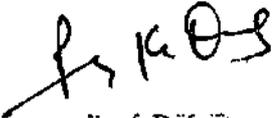
**OT Fumigator (General)**

Ultra Low Volume Fogger should have the following features:

- It should convert the aerial disinfectant being used into nearly invisible droplets of particle size 0.1 -10 microns.
- The throw of generated particles should be up to 15 feet
- Should be suitable for 100 ~ 1,000 square feet
- Should be made of corrosion proof, durable glass filled nylon
- Should be Compatible with all types of water based disinfectants including acidic, alkaline, oxidizing, quaternary ammonium based, peroxide and silver nitrate combination
- Nozzle should be made of SS316
- Should have an integrated air intake filter
- Should have an integrated reservoir filter
- The tank should be made of HDPE and the capacity should be  $\geq 6$  Lit
- Disinfectant Level should be visible in the tank.
- Timer of 0-60 minutes should be integrated with the fogger body
- Should be supplied with a rotational stand which rotates at  $360^\circ$  for complete coverage of the area to be fumigated

  
 Dr. Sunil Kr. Singh  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
 Dr. Manodeep Sen  
 Professor  
 Department of Microbiology  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

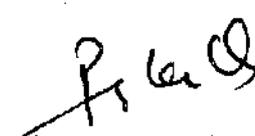
### Plasma Sterilizer (Table top)

1. The Plasma Sterilizer should provide simple and fast sterilization of medical accessories/ device at low temperature using Hydrogen Peroxide Plasma Sterilization technology.
2. The Plasma Sterilizer should be suitable for sterilization of medical items like flexible endoscopes, rigid endoscopes, lumen and non-lumen, metal, non-metal, heat & moisture sensitive instruments etc.
3. The Plasma Sterilizer chamber should have usable volume of 90 to 120 liters. The chamber Material should be SS304/ Aluminum and with 02 No/ of shelves.
4. The Plasma Sterilizer should have three preprogrammed sterilization cycles. The total sterilization cycle time should not exceed 60+5 minutes. The Equipment should have facility to store sterilization cycles parameters.
5. The sterilization temperature range should be in between 35 to 60 degree.
6. The Plasma Sterilizer should work with H<sub>2</sub>O<sub>2</sub> concentration of 50-60% and it should be able to sterilize flexible lumen and rigid lumen endoscopes.
7. The Plasma Sterilizer should be capable to distribute the plasma homogenously through the Chamber.
8. The Plasma Sterilizer should have in built thermal printer for printing & facility for recording of cycle details.
9. The Plasma Sterilizer should be microprocessor controlled, mobile, compact in design and have pneumatically or electrically controlled door with complete safety protocol with multiple locking.
10. The Plasma Sterilizer should have diagnostic system to detects & remove excess moisture thus eliminating chances of contamination due to residual bio burden prior to sterilization cycles & self test functions.
11. The Plasma Sterilizer should have pre-programmed cycles for flat instruments and for hollow and flexible items.
12. The Plasma Sterilizer should have various alarm facility such as emergency stop, door safety, over heat protection, electrical safety etc.
13. The Plasma Sterilizer should have
14. The Plasma Sterilizer should be environment friendly and have no toxic products or harmful residues in the sterilized items and in chamber.
15. The Plasma Sterilizer Should be supplied with stabilizer of min. 5 KVA & operate in 230V AC/ Single Phase.
16. Sterilant can be bottle/ cassette/ cartridge and can be stored at room temperature.
17. The Plasma Sterilizer should be supplied with sterilant bottle Cassette for 1000 cycles including following consumables accessories items:-

• Instrument tray

  
Dr. Sunil Kr. Singh  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Manodeep Sen  
Professor  
Department of Microbiology  
Dr. R.M.L.I.M.S., Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

- Appliance Box
- Heavy duty sealing Machines and Electric cutter machine
- Biological Indicator Incubator
- Biological Indicator (read out time should not be more than 30 minutes)
- Chemical indicator Strips (Class 5)
- Chemical Indicator tape (40m)
- Packing Paper for wrapping instruments (with class 5 chemical indicator) of following different sizes.
  - 70mm
  - 150mm
  - 250mm
  - 350mm
  - 400mm
  - 500mm
- Wrap Cloths (1.2 m x 1.2m)
- Thermal Printer paper
- Vaccum Pump Oil

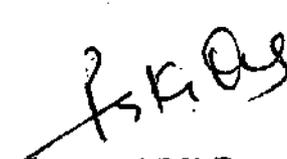
18. The manufacturers should have at least 10 installations of plasma sterilizer in India with reputed govt hospitals, Performance/ satisfactory installation reports should be enclosed with the bid 24.

**Certifications:**

- The Plasma Sterilizer should be USFDA/CE ISO 13483 approved.
- The Plasma Sterilizer should confirm to international safety & quality standards with proper certifications such European CE (four digit notified body)/US-FDA/ should comply to process standard ISO 13485 EN ISO 14937 & MDSAP
- The Plasma Sterilizer should conform to international safety & quality standards ISO13485 & ISO 14937 MDSAP etc
- The Plasma Sterilizer should have US FDA CERTIFICATE/ European CE certificate for sterilization of metal and non metal instruments

  
 Dr. Sunil Kr. Singh  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
 Dr. Manodeep Sen  
 Professor  
 Department of Microbiology  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## Plasma Sterilizer Table Top - Low Temperature Hydrogen Peroxide

- Sterilization process should involve Hydrogen Peroxide Gas Plasma Technology.
- Should provide simple and fast sterilization of medical devices like laparoscopic instruments, heat and moisture sensitive instruments, Fine and Sharp operation theatre instruments etc.
- Should have the sterilization temperature less than 55° degree C
- The Shortest cycle should be less than 30 min.
- Total size of the chamber should be more than 90-120 litre and should be able to sterilize in a cycle at least 4 trays of size 12"(D) x 8"(W) x 2"(H) each without stacking the trays
- The system should have microprocessor control.
- It should be able to document cycle with printout of the cycle parameters
- The system should be environment friendly and should not leave toxic by-products or harmful residues.
- The system should have Biological indicator reader which should give result in 30 Minutes
- The sterilant should be in cassette with leak indicator or in any other compatible form and should be stored at room temperature.
- Should detect excess moisture thus eliminating chances of contamination due to residual bio burden
- Should have self-diagnostic capability for trouble shooting
- Supplier should be able to provide 'back- up technical support to institute. Should submit reports of already done such support as a proof
- Should have minimum 3 Installations in India of quoted model in India at the time of quotation from Govt./Autonomous/Reputed private Institution to be submitted along with the technical bid.

### Certifications:

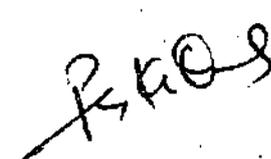
- The system should be approved by US FDA/European CE/BIS



Dr. Sunil Kr. Singh  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.M.S., Lucknow



Dr. Manodeep Sen  
Professor  
Department of Microbiology  
Dr. R.M.L.M.S., Lucknow



Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

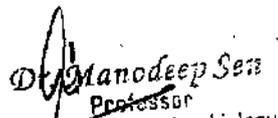
### Spray Gun Rinser for Air and Water

**Description**

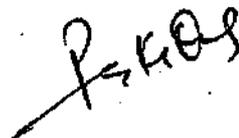
½ inch hose size  
Made of Aluminum with black anodized grip  
With 8 (½ inch) attachments suitable for hose  
1.5 Meter plastic hose



Dr. Sunil Kr. Singh  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow



Dr. Manodeep Sen  
Professor  
Department of Microbiology  
Dr. R.M.L.I.M.S., Lucknow

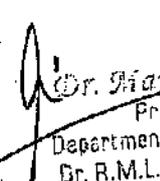


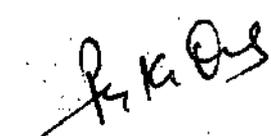
Prof. P.K. Das  
Professor & Head  
Dept. of Anesthesiology & CCM  
Dr. R.M.L.I.M.S., Lucknow

**STEAM STERILIZER**

<b>Machine</b>	:	<b>Steam Sterilizer</b>
<b>Type</b>	:	<b>HORIZONTAL</b>
<b>Size</b>	:	<b>450mm x 450mm x 1200mm</b>
<b>Sterilizing Temperature</b>	:	<b>Range 121°C to 134°C</b>
<b>Certifications</b>	:	<b>ISI (BIS) Mark IS: 3829 (PART-1)</b> <b>ISO 9001:2015</b> <b>ISO 13485:2016</b> <b>ISO 17665-1:2006</b> <b>WHO GMP</b>
<b>Design standard as per</b>	:	<b>Construction as per:</b> <b>European CE Standard</b> <b>The Sterilizer Electrical Wiring is safe and follows the following electrical standard:</b> <b>IEC 60601-1-2016</b> <b>IEC 60601-1-2</b> <b>IEC 61010-2</b>
<b>Chamber Volume</b>	:	<b>243 Litre</b>
<b>Doors</b>	:	<b>Double Hinged Door</b>
<b>Material of Construction</b>	:	<b>Chamber: SS 316</b> <b>Jacket &amp; Non-Contact Parts: SS 304</b> <b>Insulation: 50 mm thick Mineral Wool</b> <b>Piping: SS 304</b> <b>Door: SS 304</b> <b>Insulation cladding: SS 304</b> <b>Door Sealant: High Grade Silicon Gasket</b> <b>Stand: Tubular MS Powder Coated</b>
<b>Finish</b>	:	<b>Internal: Mirror</b> <b>External: Matt</b>
<b>Process Control and Other Features:</b>	:	
<b>Machine Operation Control</b>	:	<b>By Programmable Logic Controller (PLC)</b>
<b>Machine Operational Interface</b>	:	<b>By Pre-programmed Coloured HMI touch screen And Multi Port Valve</b>
<b>Sterilizing Temperature</b>	:	<b>Minimum: 121°C</b> <b>Maximum: 134°C</b>
<b>Sterile Hold Time</b>	:	<b>Minimum 15 min.</b> <b>Maximum as required</b>
<b>Chamber Pressure at Sterilization</b>	:	<b>Minimum 1.2 bar</b> <b>Maximum 2.1 bar</b>
<b>Dual Operation Mode</b>	:	
<b>The Machine will be capable of running in manual as well automatic mode</b>		
<b>Pre-Programmed Cycles</b>		

  
**Dr. Sunil Kr. Singh**  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
**Dr. Manoj Kumar Das**  
 Professor  
 Department of Microbiology  
 Dr. R.M.L.I.M.S., Lucknow

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

Machine should have at least 6 pre-programmed cycles as mentioned below:

- Instrument Cycle
- Liquid Cycle
- Fabric Cycle
- Customer Variable Cycle
- Bowie Dick Test Cycle
- Leak Test Cycle

#### **USER CUSTOMIZABLE CYCLE**

The machine having user variable cycle will allow user to customize the temperature settings, pressure settings and vacuum pulse settings

#### **PASSWORD PROTECTION**

The sterilizer settings will be password protected

The date and time setting will password protected, and User will be able to update date and time settings on the screen for better record keeping

#### **AUTOMATIC FAULT DETECTION SYSTEM**

The Machine will be equipped with following automatic detection systems:

- **Door lock detection system**, in case, if the doors are not closed properly the user will be notified
- **Temperature detection system** and the user will be notified in case the machine fails to reach the set temperature or if the temperature overshoots
- **Water detection system**- The user will be notified in case the water level is not optimum for regular machine operation
- **Multiple faulty sensor detection system** and user will be visually notified of the same

#### **PRINTING**

The user will be able to connect printer (available at extra cost) to record the progress of the sterilization cycle along with following data points in real time:

- Date and time of the cycle
- Status of the cycle
- Temperature at drain, chamber pressure at every event change and during sterile hold it can be printed at  
desired interval, minimum of 1 minute
- All undesired situation (faults) can be printed at the time of fault generation

#### **DOOR FEATURE**

The Sterilizer will have Hinged Single Door with Shooting bolts locking system  
Robust and Strong Door frame will be provided to ensuring smooth and proper door alignment over a long period of time

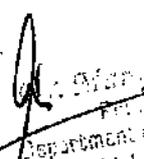
Door opening safety:

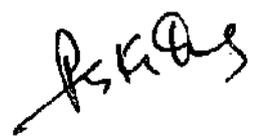
- Door will open only when chamber is at room pressure at the end of cycle or if emergency stop button is pressed
- Dual safety lock system will be provided for door locking, one mechanical and one electronic locking mechanism

**INSULATION:** All the external surfaces to be insulated (except where insulation would interfere with the function and operation of the sterilizer), to minimize the heat transmission to the environment.

#### **VACUUM SYSTEM**

  
Dr. Sunil Kr. Singh  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. R.M.L.I.M.S., Lucknow  
Department of Anesthesiology  
Dr. R.M.L.I.M.S., Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Machine having two types of vacuum system.

Venture vacuum device will be provided to create high vacuum pressure leading to dry loads on completion of sterilization.

Machine is equipped with Branded Mono black Water Ring type Vacuum Pump: For component and drying cycle.

#### **OTHER ESSENTIAL COMPONENTS**

- Dial Type Thermometer: Indicates sterilization temperature.
- Compound Gauge: Indicates chamber pressure/ vacuum
- Pressure Gauge: Indicates jacket / boiler pressure
- Valves: Pneumatic Type
- Condenser:
- Air Filter:
- Airtight Sealing: Heavy Duty branded jointless silicon gasket will be provided

#### **Other Safety Features**

- Dual Safety Valves
- Machine is provided with overload safety relay
- Equipment settings will not get disturbed due to power failure and will not restart without human intervention.
- Equipment has 11 Alarm system that will indicate fault through audio / visual signal with details on Control panel/PLC (Failure mode detection).
- An Easily Accessible emergency stop to be provided on main control panel door
- The Sterilizer is fitted with vacuum breaker system to prevent collapsing of Jacket due to vacuum formed by condensation of steam.
- The Sterilizer is fitted with shut off valves to prevent leakage of hot water and steam in case of damage

**The Sterilizer should have SS 304 frontal flush mounting on Non-Sterile Side**

#### **Sterilization Trolley**

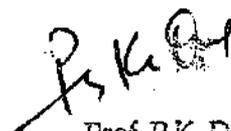
<b>Equipment</b>	:	Sterilizer Loading Trolley
<b>Size</b>	:	Suitable for loading of rectangular sterilizer
<b>Material of Construction</b>	:	Stainless Steel 304
		Locking arrangement must be provided with castor wheels

#### **Rectangular Carriage**

<b>Equipment</b>	:	Sterilizer Rectangular Carriage
<b>Size</b>	:	Suitable for loading of rectangular sterilizer
<b>Material of Construction</b>	:	Stainless Steel 304
		16-gauge SS must be used for construction

  
 Dr. Sunil Kr Singh  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
 Dr. Manojdeep Sen  
 Professor  
 Department of Microbiology  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**Steam Boiler System for Steam Sterilizer:  
Capacity: Suitable for 1000 Ltr. Steam Sterilizer**

The vertical Steam Boiler is compact and compact, equipped with automatic water pump, automatic water level control and pressure control for continuous operation. Steam output valve can be directly connected with hard pipe and can be connected with high temperature resistant steam hose, flexible and flexible, effectively saving the use of space. Steam Boiler should be easy to move, install and use. Pure steam with pure water as raw water, pure steam condensation can meet the requirements of water injection. Softened water, deionized water and pure water can be raw water of pure steam. Boiler steam generator – Separation (removal of particles, bacteria, endotoxins) and delivery to the point of use under pressure. Steam boiler system produces pure steam which can be used for steam sterilizer up to 1000 Ltr. Capacity.

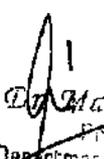
The vertical electric steam boiler should be designed for maximum efficiency and reliability, making it ideal for Steam Sterilization applications. The heating elements should be fully immersed in water, ensuring excellent insulation and minimal radiation loss, contributing to an efficiency close to 100%. The boiler should be environmentally friendly and cost-effective.

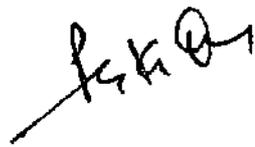
The boiler should be automatic control interface that displays real-time operational status and offers flexible control options—either automatic or manual. Safety and reliability are prioritized with built-in multi-layer protection, a dedicated safety valve connected to the steam outlet, and high-precision pressure gauges.

Constructed with 316L stainless steel seamless tubes, the heating elements are highly resistant to corrosion and can be customized using nickel-based alloy steel for specific requirements. The controller allows for grouped automatic shutdown of heating tubes, optimizing pressure output stability and enhancing energy efficiency.

Steam Generator should be equipped with a stainless steel water tank and overflow port, high-quality electronic components, and a high-lift water pump with over-temperature protection for long-lasting performance. To further enhance safety, each heating tube group is equipped with an individual contactor, and the system is designed to immediately shut down and disconnect power if a heating element phase is missing.

  
Dr. Sunil Kr. Singh  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Manoj Sen  
Professor  
Department of Microbiology  
Dr. R.M.L.I.M.S., Lucknow

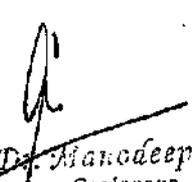
  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

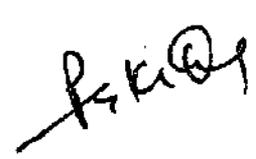
**ULTRASONIC CLEANER**

**Size**  
**Volume**  
**Design**

- : Overall size 530 mm L x 330 mm x 350 mm  
30 Liter/45 Liter
- : Contains Output frequency 35khz  
Has solid state technology for the ultrasonic generator and  
PZT transducers

  
Dr. Sunil Kr. Singh  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Manojdeep Sen  
Professor  
Department of Microbiology  
Dr. R.M.L.I.M.S., Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

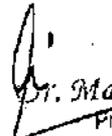
**WASHER DISINFECTER**

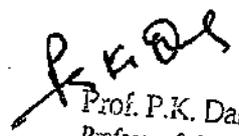
<b>Type</b>	:	Fully Automatic
<b>Temperature</b>	:	Disinfection at 80 to 90°C Pre-Rinse at 60°C
<b>Design standard as per</b>	:	Construction as per: European CE Standard The sterilizer electrical wiring must be safe and should follow the following electrical standard: IEC 60601-1-2016 IEC 60601-1-2 IEC 61010-2
<b>Certifications Required</b>	:	ISO 9001:2015, ISO 13485:2016, WHO GMP
<b>Chamber Volume</b>	:	275 Litre
<b>Doors</b>	:	Single vertical sliding door
<b>Material of Construction</b>	:	Chamber: SS 316 Body: SS 304 Non-Contact Parts: SS 304 Interconnected Piping: SS 304 Door Sealant: High Grade Silicon Gasket Door- High Temperature Resistant Acrylic By Programmable Logic Controller (PLC)
<b>Required Process Control and Other Features:</b>	:	
<b>Machine Operation Control</b>	:	
<b>Machine operational interface</b>	:	By Pre-programmed HMI touch screen (5" )
<b>Process specification:</b>	:	
<b>Disinfection Temperature</b>	:	Minimum: 80°C Maximum: 90°C
<b>Pre-Rinse Temperature</b>	:	Minimum: 55 °C Maximum: 65°C

The washing chamber is equipped with 7 Nozzles to ensure good water penetration from all directions

- User can control all the operation using touch screen HMI provided on the control panel on the front facia of non-sterile side
- Machine is equipped with 6 pre-programmed cycles
- User variable cycle is provided where user can customize the temperature settings, washing temp, time and also control the tube washing
- A dedicated nozzle is provided to wash the tube and pipe like equipment's
- The settings are password protected
- The date and time setting are password protected and User can update date and time settings on the screen

  
Dr. Sunil Kr. Singh  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Manoj Kumar Sen  
Professor  
Department of Microbiology  
Dr. R.M.L.I.M.S., Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

for better record keeping

- The Machine is equipped with Faulty Sensor Detection system and user is visually notified of the same
- The machine is equipped with Door lock detection system, in case, if the doors are not closed properly the user is notified
- The machine is equipped with inbuilt electric water heating system
- The machine is equipped with water detection system. The user is notified in case the water level is not optimum for regular machine operation
- The machine is equipped with dual dosing pump system for automatic pumping of enzymatic and detergent cleaners
- The machine is equipped with temperature detection system and the user is notified in case the machine fails to reach the set temperature or if the temperature overshoots
- The equipment is equipped with double vertical sliding door. One opening at the washing area side while the other at packing area side.
- Door frame should be strong & robust enough to ensure smooth door movement & consistency in alignment.

Door opening safety:

Doors have interlocking system i.e. Both doors do not open at the same time  
Door open only at the end of cycle/ or when the cycle is not running

Door have safety lock.

The equipment is capable of online real time printing using a dot matrix printer  
The machine is equipped with heated air blower pump to dry the equipment post completion of washing cycle

User can control the temperature of the drying air within the range of 60° to 120° C

#### **OTHER SAFETY FEATURES**

Machine is provided with overload safety relay

Equipment settings are not disturbed due to power failure and do not restart without human intervention.

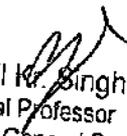
Equipment indicates fault through audio / visual signal with details on Control panel/PLC (Failure mode detection).

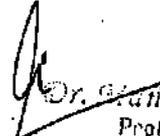
An easily accessible emergency stop is provided on main control panel door

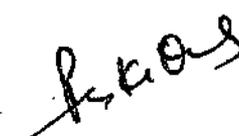
The equipment is hydraulically tested at 2.5 times the working pressure

The sterilizer has safety valve for added safety

#### **DISTILLATION UNIT**

  
Dr. Sunil K. Singh  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Ananddeep Sen  
Professor  
Department of Microbiology  
Dr. R.M.L.I.M.S., Lucknow

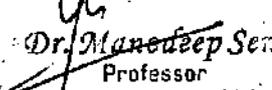
  
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Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

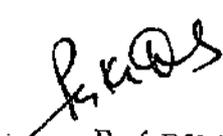
**Volume** : 20 litre / hour  
**Type** : Barnstead Type  
**Sterilizing Temperature** : Maximum 121° C  
**Design standard as per** : Manufactured as per:  
 IS: No.3830 and/or  
 European CE  
 The Sterilizer Electrical  
 Wiring is safe and  
 follows the following  
 electrical Standard:  
 IEC 60601-1-2016 IEC  
 60601-1-2  
 IEC 61010-2

**Certifications Required** : ISO 9001:2015, ISO 13485:2016, WHO GMP  
**Material of Construction** : Chamber: SS 304  
 The evaporator: SS 304  
 Multi-baffle: SS 304  
 The condenser: SS 304  
 Piping: SS 304  
 Door Sealant: High Grade Silicon Gasket  
**Finish** : Internal: Mirror  
 External: Matt

The equipment provides pyrogen free distillate  
 The equipment has smooth finished without any sharp edges and crevices  
 The condenser is provided with stainless steel tubes, water inlet and outlet connection.  
 The Unit is fitted with ISI marked water immersion heating elements  
 The Water Still is supplied in a ready to use condition mounted on a suitable stand.  
 Water Distillation is equipped with smart electronic water sensor for accurate detection  
 and heater protection  
 Jointless steam resistant silicon gasket is used for sealing  
 Fuse and current leakage breaker is provided for safety in case of voltage fluctuation or  
 short circuit.  
 Suitable for operation on 220/230 volts; 3 phase AC supply, electrical load being 15 KW

  
 Dr. Sunil Kr. Singh  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

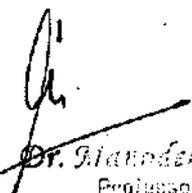
  
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 Professor  
 Department of Microbiology  
 Dr. R.M.L.I.M.S., Lucknow

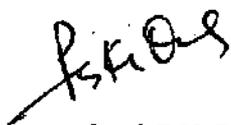
  
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 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**Worktable with Double Sink**

- Size** : Overall size 2100 mm x 650 mm x 900 mm Ht
- Description** : Table is used for washing and decontaminating the instruments in CSSD and is designed for standing and sitting workers
- Design** : The table is polished having smooth surface  
Top is designed to give a stable work surface.  
The tabletop frame is a complete assembly with front, side and two end welded together
- The 2 sinks are made of stainless steel with inside polished. Each sink is provided with a drain valve and a strainer
- On the bench top, just above the sinks hot and cold-water mixer and connection is provided
- Material of Construction** : SS 304 - 16 SW Gauge
- Certifications** : ISO 9001:2015, WHO GMP

  
Dr. Sunil Kr. Singh  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Ananddeep Singh  
Professor  
Department of Microbiology  
Dr. R.M.L.I.M.S., Lucknow

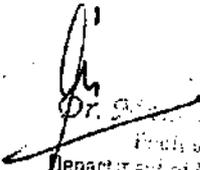
  
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Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

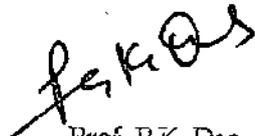
## Big Basket (Modular Sterilizing)

- Size: 585x395x195 mm
- Area: Various movement
- It will be modular design with standard SPRI sizes and high precision and will be designed for sterilizing / processing as well as easy handling and management of the supply, storage and distribution of re-circulated sterilized goods.
- It will be self-drying after disinfection in hot water (min.+85°C)
- It will be sturdy, jig-welded trays maintain their size and shape even if handled carelessly.
- It will be both nest able and stackable. There will be special wire support to help making baskets both stackable (when the supports are folded into the basket) and nest able (when the supports are folded out)
- The top frame will be designed such that it will serve as a handle grip for easy carrying even when heavily loaded.
- There will be no sharp edges or wires.
- The baskets will be made of electro-polishes heavy-duty stainless steel (304) and will have a rigid bottom frame that gives space for airing between goods and work surfaces and allow use on roller belt and chain conveyors.

It will be designed and manufactured in accordance with high quality specifications to assure long lifetime.

  
Dr. Sunil Kr. Singh  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. R.M.L.I.M.S.  
Professor  
Department of Microbiology  
Dr. R.M.L.I.M.S., Lucknow

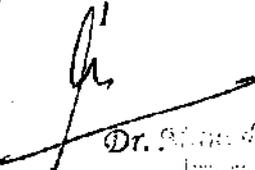
  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

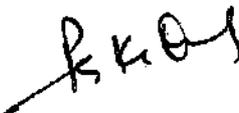
### Medium Basket (Modular Sterilizing)

- Size: 585x395x100 mm
- Area: Various movement
- It will be modular design with standard SPRI sizes and high precision and will be designed for sterilizing / processing as well as easy handling and management of the supply, storage and distribution of re-circulated sterilized goods.
- It will be self-drying after disinfection in hot water (min.+85°C).
- It will be sturdy, jig-welded trays maintain their size and shape even if handled carelessly.
- It will be both nest able and stackable. There will be special wire support to help making baskets both stackable (when the supports are folded into the basket) and nest able (when the supports are folded out)
- The top frame will be designed such that it will serve as a handle grip for easy carrying even when heavily loaded.
- There will be no sharp edges or wires.
- The baskets will be made of electro-polishes heavy-duty stainless steel (304) and will have a rigid bottom frame that gives space for airing between goods and work surfaces and allow use on roller belt and chain conveyors.

It will be designed and manufactured in accordance with high quality specifications to assure long lifetime.

  
Dr. Sunil Kr. Singh  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.M.S., Lucknow

  
Dr. R.M.L.M.S.  
Department of Microbiology  
Dr. R.M.L.M.S., Lucknow

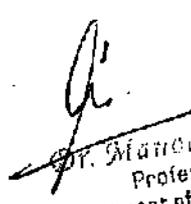
  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**Tape Dispenser(Multi Roll)**

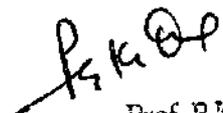
- Size: (LxWxH) 260x60x120mm
- This dispenser for sterilizer tape will hold two reels of tape.
- The heavy-duty bottom plate will be fitted with anti-slip rubber to prevent the dispenser from slipping when tape is torn off.
- Will be made of high-quality coated steel for long use.



Dr. Sunil Kr. Singh  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow



Dr. Manojdeep Sen  
Professor  
Department of Microbiology  
Dr. R.M.L.I.M.S., Lucknow

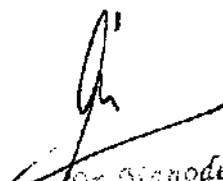


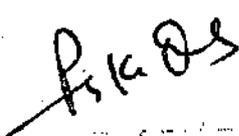
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

### Basket Rack for CSSD

- Size (LxWxH): 1850x480x2150 mm(Single)
- Size (LxWxH): 1850x800x2150 mm(Double)
- Single and Double basket storage racks to store wire baskets in sterile storage and/or as pre-storage of clean packed goods.
- The rack will be designed as an open unit to promote aeration of sterilized goods and to make inspection of stored goods as easy as possible.
- Will provide rigid, horizontal guide-rails, consisting of 50 x 20 mm steel profiles for loading and unloading the baskets by sliding the baskets on rail.
- The guide-rails will be welded to a robust support column mounted on a rigid floor stand.
- The columns will be joined by support frames on top and below the base of the rack.
- To facilitate cleaning of the floor, the base will have a rigid construction that minimizes the number of legs needed for support.
- Each leg will have an adjustable foot ( $\pm 25$  mm).
- The rack will be made of SS.
- The single rack will be a free-standing section that holds 5 baskets in each vertical.

  
 Dr. Sunil Kr. Singh  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
 Dr. Manodeep Singh  
 Professor  
 Department of Microbiology  
 Dr. R.M.L.I.M.S., Lucknow

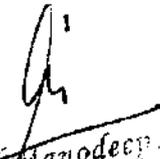
  
 Dr. Anand Kumar  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**RO plant for CSSD**

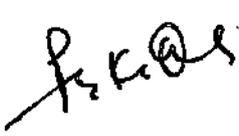
- Reverse Osmosis Plant 1000 Liters per hour capacity
- Will have stainless steel skid mounts for pre-treatments and RO unit
- Will have booster Pumps.
- Will have direct bypass valve and auto flush systems.
- Will have thin film composite membrane of equivalent.
- Will have dry run protection of pump.
- Will have auto flush timer.
- Will have automatic tank level control.
- Will have over voltage and over current protection.
- Will have high efficiency reverse osmosis membrane.
- Will have 6000 L purified water reservoir with bacterial vent filter to ensure microbiological integrity.
- Will have re-circulation pump provides instantaneous delivery flow.
- Will have comprehensive micro-processor monitoring and control system.
- Consumable filters & other accessories of 2 each extra to be provided



Dr. Sunil Kr. Singh  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow



Dr. Manodeep Sen  
Professor  
Department of Microbiology  
Dr. R.M.L.I.M.S., Lucknow

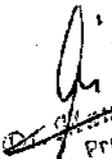


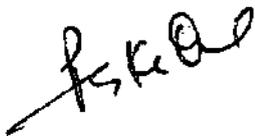
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

### Small steam sterilizer (vertical autoclave 100 litres)

- Capacity 100 liters or more.
- Automated microprocessor-controlled operation.
- Automatic sterilization system for unattended operation. Heating> Check safe> Sterilization> Sterilization safe> Exhausting> End.
- Sterilization temperature range between 110 to 123 °C and for melting 60 to 100 °C.
- Three (General, Standard, Program) modes provided to allow a choice of sterilization; processes optimized for the application.
- The autoclave must have a time 1 to 999 minutes and facility of programming 4 Standard Mode (Decontamination, Solid Sterilization, Melting), A Program Mode (Sterilization 1, Sterilization 2, Liquid Sterilization, Melting)
- LED display lamp, clear VFD and sterilization step to check operation status, warning alerts and sterilization progress.
- Must have a maximum loading capacity of Erlenmeyer Flasks each x floor, 250 ml 20 x 5, 500 ml 14 x 4, 1000 ml 8 x 3, 2000 ml 5 x 2.
- Safety features like safety door cover made of plastic with low thermal conductivity to prevent burns, automatic operation of safety valve in the event of overpressure, low level of solution alarm and overcurrent and short circuit protection is must.
- Equipped with sterilization performance monitoring, gives out warning alarms for low heat; when the set temperature is not reached within the designed time; over/low temperature when the set temperature is deviated from set value during the time set and sterilization fail, when sterilization is incomplete due to power failure or any other reason.
- Powder coated steel stainless steel construction of the autoclave; the chamber must be constructed of stainless steel for superior resistance to corrosion.
- Will have working pressure range of 5 psi to 20 psi or higher.
- Touch sensitive control panel.
- Electronic Temperature Controller.
- Radical locking system.
- Inner & outer chamber made up of SS-304.
- Will have ISI marked water immersion type industrial heating elements.
- Low Water level alarm system.
- Automatic pressure switch to control the boiler/jacket pressure.
- Will be equipped with timer and alarm system.
- Inside boiler made up of heavy gauge brass sheet to withstand maximum temperature.
- Lid made of heavy gun metal casting machined to fit the gun metal casting ring by means of durable steam quality Molded rubber gasket and radial locking system.
- Molded, joint less rubber gasket made of neoprene rubber.
- Extra safety valve.
- Pedal lighting device to assist opening and closing of the lid.
- Supplied with Stainless Steel Basket.

  
 Dr. Sunil Kr. Singh  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
 Professor  
 Department of Microbiology  
 Dr. R.M.L.I.M.S., Lucknow

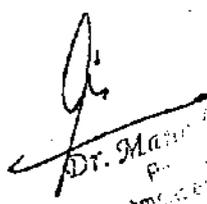
  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

- Power supply 220/230 volts Ac-50Hz
- Multi program model allowing at least 4 programs 10 be stored.
- 10-year pressure vessel integrity warranty.
- Delayed start facility.
- Audible and visible alarms including cycle fault and interruption, sterilization failure, low water level and door unlocked.
- Will have option for data recorder for documentation.
- Power requirement Will work on 200-250 at 50Hz.

**Certifications:**

- Manufacturer will be ISO certified.
- Equipment will meet electrical safety specifications such as that of IEC (class) or ISO standard for indigenous items will comply with BIS & CPCB standards.
- Will comply with standard European (CE) or American (ETL) electrical safety standards.
- System will be US FDA or CE class II certified.
- For indigenous items will comply with BIS standard.

  
 Dr. Sunil Kr. Singh  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

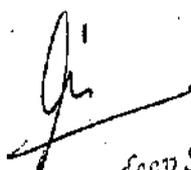
  
 Dr. Manoj Kumar Singh  
 Professor  
 Department of Microbiology  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**Wire storage Shelf module (Dirty/Clean area)**

- Minimum Size (LxWxH): 1500x450x1900 mm
- Construction will be based on single free-standing shelf modules for storage of clean linen, instruments, and packing material or sterilized goods, including disposables.
- Moreover, two single modules can be placed back to back and combined as a double module unit.
- If two units are to be connected, 10 S-hooks will be supplied..
- The wire construction will allow good air circulation while permitting easy inspection of the goods.
- The wire shelves will be made of special heavy-duty steel (304), chromium-plated and surface treated with clear epoxy varnish to facilitate cleaning.
- The shelf unit will be easy to assemble on site and all parts will fit precisely.
- Shelves will be mounted by means of plastic clamps onto circular rigid posts, with the adjustable height within a range of about 50 mm. Each post will include a height adjustable foot.
- Each unit will include 5 shelves.
  - The shelf unit will have optional  $\varnothing$  125 mm castors for using as a mobile storage unit by replacing the foot with castors.

  
Dr. Sunil Kr. Singh  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Manojdeep Sen  
Professor  
Department of Microbiology  
Dr. R.M.L.I.M.S., Lucknow

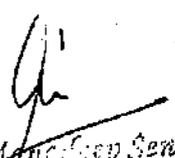
  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Electric Steam Boiler

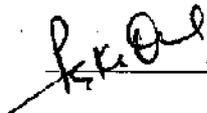
- Capacity: 100 kg/hr / 200 kg/hr/300 kg/hr
- Material: Mild Steel
- Working Pressure: 4 kg/cm<sup>2</sup>(g)
- Machine Type: Automatic
- Phase: 3 Phase
- Voltage: 415V±6%
- Efficiency: 88 ± 2%
- Electric steam Boilers are automatic.
- Fully Automatic Operation.
- High efficiency
- Compact & easy to operate.
- Perfect and smokeless combustion.
- Minimum maintenance cost.
- Noise less operation.



Dr. Sunil Kr. Singh  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow



Dr. Manojdeep Sen  
Professor  
Department of Microbiology  
Dr. R.M.L.I.M.S., Lucknow



Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

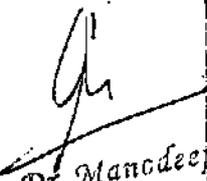
## CENTRIFUGE

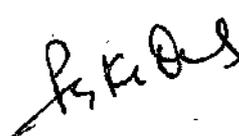
1. The centrifuge must offer swinging bucket, fixed angle rotors.
2. RPM 12,000-18,000 and RCF at least 30,000g
3. CE marked, IVD compliant, UL listed- for safety containment
4. The buckets and rotor sealing lids must be certified for bio-containment by a 3rd party lab of worldwide recognition.
5. Rotor should be autoclavable
6. Digital display
7. Fast slow down time
8. Fixed angle rotor 6x50 & adapter for 6x15 ml with RPM approx 9,500 & RCF approx 12,000 g or more for cell culture application.
9. Rotor for 24x1.5-2ml MCT.
10. Should be quoted with adaptors of all possible sizes and all absolutely essential requirements
11. All the accessories should be provided for proper installation and to check the quality control of equipment
12. Servo/Luminous/ V Guard (or of equivalent quality) UPS of 2 to 5 KV (as appropriate) to be quoted separately
13. All accessories should be from the same Original Equipment Manufacturer for the main unit.

### Certifications:

1. Instruments must be ISO certified and a copy should be enclosed. (The ISO Certificate must be issued by any organization accredited by the Bureau of Indian Standard or accredited by the international accrediting forum "IAF" (Certificate to be attached).
2. Should be USA FDA and/or European CE be approved by 4 digits notified body.

  
 Dr. Sunil K. Singh  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
 Dr. Mandeep Sen  
 Professor  
 Department of Microbiology  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## PLASMA STERILIZER-LOW-TEMPERATURE HYDROGEN PEROXIDE

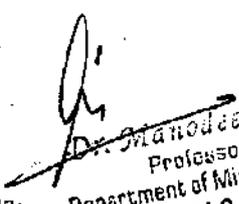
1. Sterilization process should involve Hydrogen Peroxide Gas Plasma Technology
2. Should provide simple and fast sterilization of medical devices like laparoscopic instruments, heat, and moisture sensitive instruments, Fine and Sharp operation theatre instruments, etc.
3. Should have the sterilization temperature less than 55degree C
4. The cycle time should not be greater than 60 min
5. Total Size of the chamber should be more than 150 liters and should be able to sterilize in a cycle at least 4 trays of size 24"(D) x 8"(W) x 2"(H) each without stacking the trays
6. The system should have microprocessor control
7. The system should have double door facility
8. It should be able to document the cycle with a printout of the cycle parameters
9. The system should be environment friendly and should not leave toxic by-products or harmful residues
10. The system should have a BI reader which should give results in 30 Minutes
11. Should be validated by IFUs of leading and reputed device manufacturers of endoscopes, laparoscopes, fiberscopes, batteries & power tools such as Karl Storz, Stryker, Olympus, etc. to ensure compatibility
12. The sterilant should be in a cassette with a leak indicator and should be stored at room temperature
13. Should detect excess moisture thus eliminating chances of contamination due to residual bioburden
14. Should have the self-diagnostic capability for troubleshooting
15. Supplier should be able to provide backup technical support to institute in ISO 14937 process validation. Should submit reports of already done such support as proof.
16. Should have the capability to sterilize robotic instruments.
17. All accessories should be from the same Original Equipment Manufacturer for the main unit.

### Certifications:

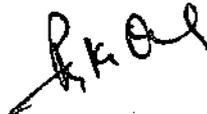
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Dr. Sunil Kr. Singh  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow



Dr. ManodEEP Sen  
Professor  
Department of Microbiology  
Dr. R.M.L.I.M.S., Lucknow



Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## PLASMA STERILIZER TABLE TOP-LOW-TEMPERATURE HYDROGEN PEROXIDE

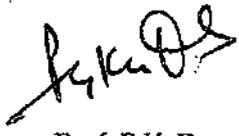
1. Sterilization process should involve Hydrogen Peroxide Gas Plasma Technology.
2. Should provide simple and fast sterilization of medical devices like laparoscopic instruments, beat, and moisture sensitive instruments, Fine and Sharp operation theatre instruments, etc.
3. Should have the sterilization temperature less than 55 degrees C.
4. The shortest cycle time should be less than 30 min.
5. Total Size of the chamber should be more than 50 liters and should be able to sterilize in a cycle of at least 4 trays of size 12" (D) x 8" (W) x 2" (H) each without stacking the trays.
6. The system should have microprocessor control.
7. The system should be environment friendly and should not leave toxic by-products or harmful residues.
8. It should be able to document the cycle with a printout of the cycle parameters.
9. The system should have a biological indicator reader which should give results in 30 Minutes.
10. Should be validated by IFUs of leading and reputed device manufacturers of endoscopes, laparoscopes, fiberscopes, batteries & power tools such as Karl Storz, Stryker, Olympus, etc. to ensure compatibility.
11. The sterilant should be in a cassette with a leak indicator and should be stored at room temperature.
12. Should detect excess moisture thus eliminating chances of contamination due to residual bioburden.
13. Should have the self-diagnostic capability for troubleshooting.
14. Supplier should be able to provide backup technical support to institute in ISO 14937 process validation. Should submit reports of already done such support as a proof.
15. Should have a minimum of 50 installations of the quoted model in India at the time of quotation from Govt/Autonomous/Reputed private Institution to be submitted along with the technical bid.
16. Should have minimum 3 installations in India of quoted mode.

### Certifications:

1. Instruments must be ISO certified and a copy should be enclosed. (The ISO Certificate must be issued by any organization accredited by the Bureau of Indian Standard or accredited by the international accrediting forum "IAF" (Certificate to be attached).
2. Should be USA FDA and/or European CE be approved by 4.digits notified body.

  
Dr. Sunil Kr. Singh  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

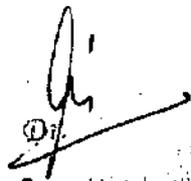
  
Dr. Manodeep Sen  
Professor  
Department of Microbiology  
Dr. R.M.L.I.M.S., Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## AUTOCLAVE

S NO.	Equipment Specification
<b>1.</b>	<b>Double Door Horizontal Rectangular Steam Sterilizer (432 Litres.)</b>
<b>A.</b>	<b>Operating parameter</b>
•	Operating Pressure 34 PSI
•	Operating Temperature 134°C
•	Vacuum 20-24" Hg
<b>B.</b>	<b>Quality compliance</b>
•	NABH Norms Compliance
•	BIS 3829 Part I
•	Indian BD Test: Air Removal & Steam Penetration Test Compliance
•	European BD Test: EN-285 (EN ISO 11140-1+4 7 KG Test) Compliance
•	American BD Test: AAMI/ANSIST79 (ISO 11140-1+5 4 KG Test) Compliance
•	Biological Testing
•	Test Strip all Classes
<b>C.</b>	<b>Features required</b>
•	Single Sheet Chamber Fabrication
•	Gasket Groove for Silicon Gasket long life
•	Maximize Loading Capacity design
•	Minimize Electric, Water and maintenance cost
•	Completely Pneumatic Valve Control System
•	Sterilizer Sealing with Teflon/Silicon or better material for long service life
<b>D.</b>	<b>Chamber</b>
•	Triple Walled Rectangular design
•	SS 316 quality heavy duty chamber design
•	Single Sheet Chamber Design for long working life
•	Maximum Chamber utilization by minimum curb design
•	Mirror Polish surface for preventing water deposit
•	Chamber design with a 2% Slope for full draining of the condensate
•	Baffle For effective distribution of steam throughout the chamber & to avoid the entering steam from directly hitting the load.
•	Front Panel S.S. 304 for Controlling and Operational Parameter Display by HMI and Gauges.
<b>E.</b>	<b>Jacket</b>
•	SS 304 quality heavy duty Jacket design
•	40-50 mm jacket for maximum storage of steam
•	Resin Bonded High-Density insulation to minimize thermal loss.
•	Heavy gauge S.S. 304 insulation covering
<b>F.</b>	<b>Boiler</b>
•	High-Pressure Boiler with thermal insulation for heat loss recovery.
•	Dual site heating element one for working and other for emergency planning (Single Side Heating Element)
•	Dual sensor low water cut off device for heaters extra precautions.
•	St. Steel Water Level Indicator with graduation marking
•	Stainless Steel Heating Element

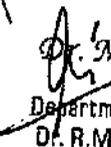
  
**Dr. Sunil Kr. Singh**  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.M.S., Lucknow

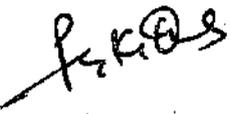
  
 Department of Microbiology  
 Dr. R.M.L.M.S., Lucknow

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLMS, Lucknow

<b>G.</b>	<b>Door</b>
•	Hinge Type Door
•	Door made of SS 316
•	Flat Door Design inside for maximum space utilization.
•	Heavy Duty Door Design
•	Door with Gasket Slot for long service life
•	High Accuracy Mechanical Door Safety inside door Plate
•	Silicon & Teflon Sealing Door Plate
•	Joint less Silicon Door Gasket
•	Heat Loss Insulation Door
•	Special Covering for preventing burning issue
•	S.S. 304 radial arms duly polished
•	Smooth operating door
<b>H.</b>	<b>Stand</b>
•	Square/Round Heavy-Duty Stand
•	Powder Coated
•	Height adjuster shoe for Label setting
<b>I.</b>	<b>Control panel</b>
•	Programmable Logic Controller
•	Touch Screen Panel (HMI)
•	Fully Auto & Manual Control System for Emergency use.
•	Emergency Stop Button
•	Panel with Siemens/Schneider/L&T product design.
•	Dual Pressure Control System
<b>J.</b>	<b>Vacuuming system</b>
•	Water Ring Type Vacuum Pump with 20"-24" Hg vacuum capacity
•	Stainless Steel 304 Condenser for steam condensate
•	S.S. 304 Vacuum Pipeline
<b>K.</b>	<b>Online feeding system</b>
•	High-Pressure online water feeding pump
•	Water Feeding without distribution of Pressure & Temperature
•	Back-to-Back Continuously Sterilizer operation
•	Heating Element Safety Device
<b>L.</b>	<b>Fresh air supply</b>
•	HEPA Filtered air supply accuracy.3 Microns
•	Hot Air supply by Jacketed forced convection System
•	Pneumatic Control Air Supply
•	S.S. 304 Pipeline
<b>M.</b>	<b>Pneumatic control system</b>
•	Pneumatically actuated angle valves with threaded connections
•	Jacket to Chamber steam controlling
•	Vacuum Line Control
•	Exhaust Line Controlling
•	Fresh Air Injecting to Chamber
•	Online Water Feeding
•	Auto water Line Control

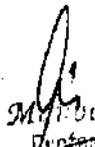
  
 Dr. Sunil Kr. Singh  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
 Dr. Manodeep Sen  
 Professor  
 Department of Microbiology  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. R.M.L.I.M.S., Lucknow

<b>N.</b>	<b>Sterilizer sealing</b>
•	Door Sealing with joint-less Silicon rubber gasket
•	Boiler Plate sealing with Teflon Gasket
•	All Pipeline connector seal with Teflon or "O"ring
•	Low Water cut-off device sealing with Teflon Gasket
•	Water Level Glass Gauge sealing with dye mold silicon rubber
<b>O.</b>	<b>Automation software features</b>
•	7 Standard program and unlimited recipe designable
•	3 label passwords protected the controlling system
•	Online Trends of operational parameter display in the screen panel
•	Bowie Dick Test, Vacuum Leak Testing, and all parameter manual testing facility
•	Process control valve operation display
•	User ID and Institutional detail display and printing facility
•	Fault Diagnostic system available in TFT Display.
•	Operation Data recording facility.
•	Inbuilt Real Time Clock with Date & Time Function.
•	Batch Printing Facility. With facility to save the last cycle data.
•	Cloud monitoring System
<b>P.</b>	<b>Inbuilt Accessories</b>
•	S.S. 316 Pressure Gauge range 0 to 60 psi with accuracy $\pm 0.5\%$
•	S.S. 316 Compound Gauge range -30 to 60 psi with accuracy $\pm 0.5\%$
•	S.S. 316 Temperature Gauge range 0 to 300°C with accuracy $\pm 0.5\%$
•	High Accuracy Safety Valve with accuracy $\pm 3$ PSI in entire range
•	Door Locking Plate Accuracy $\pm 1$ PSI on set point of 5 PSI
•	Thermostatic Control Steam Trap
•	Bucket Type Float Valve for minimum steam loss and better temperature.
•	Thermostatic Steam Trap for jacket air removal
•	Low Water Pressure Control System
•	Low Air Pressure Control System
•	Single Phase Preventer
•	High Accuracy Control Pressure Switch for accurate pressure control
•	Door interlock to prevent the simultaneous opening of both doors
<b>Q.</b>	<b>Mounting &amp; control panel</b>
•	M.S. Powder Coated Control Panel
•	The sterilizer should be mounted on a Tubular M.S. Powder Coated Stand
<b>R.</b>	<b>Manual Control</b>
•	The control system should provide Manual Control in case of PLC failure. Here all process should be operated with the help of Manual Control Switches.
<b>S.</b>	<b>Quality Control</b>
•	Calibration Certificate of pressure, Temperature and Compound Gauge
•	Hydraulic Testing Report
<b>T.</b>	<b>Test Report along with Sterilizer</b>
•	Chamber Hydraulic Test Certificate
•	Jacket Hydraulic Test Certificate
•	Pressure Safety Valve
•	Vacuum Safety Valve

  
 Dr. Sunil Kr. Singh  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

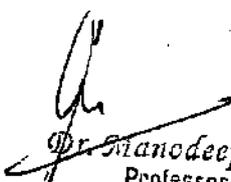
  
 Dr. M. Subeen Sen  
 Professor  
 Department of Microbiology  
 Dr. R.M.L.I.M.S., Lucknow

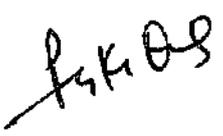
  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

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•	Door Plate Operating Accuracy
•	Pressure Gauge Accuracy Test Certificate
•	Compound Gauge Accuracy Test Certificate
•	Temperature Gauge Accuracy Test Certificate
U.	<b>Spare Parts with each Sterilizer</b>
•	3 Heating Element
•	2 Nos. Seamless Silicone Gasket
•	2 No. Pneumatic Control Valve
•	2 Nos. Pneumatic Control Valve
V.	<b>Accessories (Optional)</b>
•	S.S. Material Un-loading Trolley 2 Nos. Each Sterilizer
•	SS 304 Material Loading Carriage 1 No. Each Sterilizer
•	Panel Mounted Printer
W.	<b>Quality Control Certificates</b>
•	US FDA/European CE certified with four digit notified body number / BIS 3829 Parts -1
•	ISO Certificate
•	ISO 13485:2016 Certificate
•	CE Certificate
•	IEC 61010-1:2010 Certificate
•	ISO 14001:2015 Certificate
•	ISO 45001:2018 Certificate
•	BS EN ISO 17665-1:2006 Certificate
•	BS EN 285:2015 Certificate

  
 Dr. Sunil Kr. Singh  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
 Dr. Manodeep Sen  
 Professor  
 Department of Microbiology  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

The system should be capable of supporting two inlets and three detector ports simultaneously and should have electronic pneumatic/pressure controls for all the gases.

The system should have a digital display/vLCD on the machine for a quick view of GC Parameters.

The system should have the capability of locking/adjusting the retention time so that the same Retention time can be reproduced from system to system and the method should be electronically transferred

#### COLUMN OVEN:

- Oven temp range up to 400 Degree C or better
- Number of temperatures-programmed ramps: 9 ramps or better
- Temperature set point resolution 0.1 Degree C.
- Cool down rate: 400 Degree C to 50 Degree C in 4.5 minutes or batter.
- Maximum programmable temp ramps rates: at least 120C/min

#### Injectors:

- Split/Spitless Capillary Injector with Electronic Flow Control-1 No
- Maximum temperature: 450 Degree C
- Pressure range: 0-100 psi (100 psi with an increment of 0.001 psi)

EPC: The System should have a Pressure set point and control precision of 0.01 psi

#### Detectors:

- Flame Ionization Detector (FID) - 1 Nos
- Auto flame-out detection
- Auto flame re-ignition
- Max. Temp..... 400 degrees C or better
- Detective..... 1.5 pg C/sec or better
- Linear dynamic range.... 10<sup>7</sup> or better

#### Autosampler & Column: (Should be quoted as Optional)

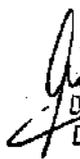
- Please quote Suitable Autosampler for 15 or more vials as an optional and suitable column
- To separate ketones, Alcohol, Alkane, Alkene, Amine, Nitro, and Esters compounds

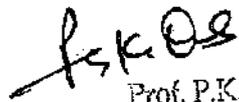
**SOFTWARE & Accessories:** The system should be supplied with user-friendly software & the entire accessory to install the system including the Gas Purification Panel, Regulators & Zero Air Cylinder. Nitrogen & Hydrogen cylinders will be supplied by the Institution.

#### Certifications:

1. Instruments must be ISO certified and a copy should be enclosed. (The ISO Certificate must be issued by any organization accredited by the Bureau of Indian Standard or accredited by the international accrediting forum "IAF" (Certificate to be attached).
2. Should be USA FDA and/or European CE be approved by 4 digits notified body.

  
Dr. Sunil K. Singh  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. R.M.L.I.M.S., Lucknow  
Department of Microbiology

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## SINGLE DOOR STEAM STERILIZER

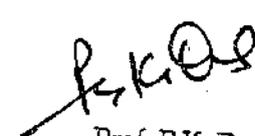
S no.	Specifications
A.	<p>Capacity: Chamber volume single door (400-500lts.)/ 16-24 cu. ft            Single Door Steam Sterilizer: (Qty. -01 Nos.)            Single Door Steam Sterilizer should be automatically PLC controlled and should be horizontal in size with pre- and post-vacuum treatment having chamber capacity of approx. 400-500lts. (Approx 1624cu.ft). The sterilizer should have ergonomic and user-friendly design with in-built to use touch screen at ergonomic height for user &amp; inbuilt electric Steam Generator and vacuum pump.</p>
B.	<p>Door &amp; Door Safety Systems: -</p> <ol style="list-style-type: none"> <li>1 The sterilizer should have automatic single door with pneumatically operated vertical/ horizontal sliding doors (Manual opening in case of automatic mechanism failure). Pneumatic door cylinder should be in stainless steel for eliminating the risk.</li> <li>2 Pressure monitoring system should be available in the chamber to monitor the chamber pressure before opening of the door. Chamber should be completely depressurized before the door seal is retracted by vacuum. Should have an essential safety feature that when the door seal is retracted the chamber is completely vented to atmosphere while the door is still retained in the fully closed and mechanically locked position.</li> <li>3 Door safety to prevent starting of process unless the door is closed and opening of door when the chamber is pressurized.</li> <li>4 The door seal should be made of silicon rubber gasket &amp; on commencement of the process the door gasket is pressed against the rear face of the door by Air to ensure the door remains closed during the process</li> <li>5 A mechanical safety edge stops the door i.e. Emergency stop should be there for extra door safety mechanism to protect staff from force of the door.</li> <li>6 IBR/ ISO approved pressure-reducing valves with gauges, the tenderer should provide traps in lines and safety valves for jacket and chamber for over pressure safety.</li> </ol>
C.	<p>Construction:-</p> <p>The chamber, doors and steam generator should be made of solid, high quality 316L Stainless Steel, Water level Indicator should be made of Stainless Steel and jacket should be made of high graded SS-316L/316 Ti with pressure gauge.</p> <ol style="list-style-type: none"> <li>1 Mounting: The chamber should be jacketed to ensure the temperature uniformity in chamber. The chamber floor should be slightly sloped towards an internal drain to facilitate drainage. A stainless-steel mesh strainer protects the drain port from blockage by debris. The chamber should be mounted on a stainless-steel frame work with height adjustable feet.</li> <li>2 Insulation: The sterilizer jacket, doors &amp; steam generator should be completely insulated with 50 to 80mm chloride free mineral wool thereby keeping the autoclave cool on the outside. The insulation should be completely encased in removable rigid aluminum/SS 316 sheet housing.</li> <li>3 Steam Supply (Steam Generator): The sterilizer should have an inbuilt</li> </ol>



Dr. Sunil Kr. Singh  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow



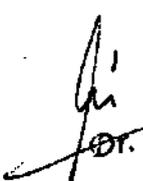
Dr. Mandeep Sen  
 Professor  
 Department of Microbiology  
 Dr. R.M.L.I.M.S., Lucknow

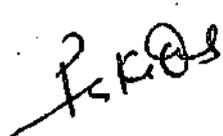


Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

	steam generator of adequate capacity. It should be mounted under the sterilizer chamber & should be made of SS316L. The steam generator pressure vessel should be made of stainless steel. The sterilizer should be equipped with dual water connections for different water quality for cooling water and steam generator. All connecting pipes and valves shall be made of good quality stainless steel. Process valves should be pneumatic.
4	It should have a built-in thermostat, pressure safety valve & water level glass gauge inspection device or water level indication on screen visible from service area.
5	Firm to mention installation space required, loading system (floor or semi floor/trolley and loading rack) offered, power supply input and fuse protection & its consumption for control process & vacuum pump.
6	Firm to confirm the size of steam supply line, steam consumption, size of water supply line, drain, exhaust and compressed air line required.
D.	<p>Vacuum Pump, Pipes, Valves &amp; Components: -</p> <p>The sterilizers should have a high-capacity efficient liquid ring vacuum pump. It should be mounted on vibration isolator for quiet operation. It should be connected to condensers to assist air removal. It should also have low water level alarm to protect it from dry run.</p>
1	The piping system should be made of Stainless Steel/ Brass/Copper/ AISI 316L.
2	All the process valves should be stainless steel or Copper Valves or Red Brass Valves or AISI 316L & should be pneumatically/ electrically operated piston valves for loner trouble free operations.
3	All the non-standard components should be non-proprietary & should be easily sourced.
4	All the hot pipes should be properly insulated. Safety valves should be made of brass/copper/ stainless steel.
5	Primary piping & fitting should be stainless steel
6	Primary components: 316 quality triclamps or threaded fitting components like-manual valve, non-return valve, pressure regular, pneumatic valves etc.
7	Electrical Components: the terminals & contacts should be housed in a water tight cabinet while the other electrical component should be directly mounted on sterilizer.
8	Air Filter: Air filter should be provided for filtering the atmospheric air before entering inside the chamber. The filter separation efficiency should be higher than 99.9988% for particle size less than 0.3µm. Air filter should be covered under warranty and CMC period.
9	Should pass a hollow load (A) test (Batch monitoring system)
10	Steam Sterilizer should have provision for connecting a ¼ " line terminating in the shutoff valve, none turn valve, Pressure relief valve, steam riser, condensate drain and other essential accessories (for future steam connection from the central boiler).
11	In case tenderer offering standalone steam generator they should provide alternatives for ensuring clean steam (as per International Standards)
12	High vacuum compressor with recycling facility.

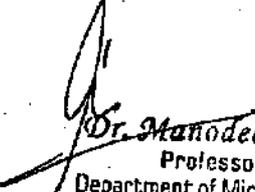
  
 Dr. Sunil Kr. Singh  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

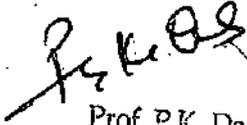
  
 Dr. Manodeep Sen  
 Professor  
 Department of Microbiology  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

E.	Control System & Operating Panel: -	
	1	The sterilizer should be equipped with Microprocessor PLC control system which is dedicated to control the sterilizer including Digital Input Output for Sterilizer control Analog measuring Inputs COM ports for printer & PC communications. The Control System is operated via access code.
	2	8 to 10" Colour touch screen to provide well-arranged simple service controls on loading side. As a default the operator should have access to select cycle, start cycle & to close door. Digital display of chamber pressure, temperature, cycle no., Batch no., Time & date, Alarm Indicator, Low water indicator. Remaining cycle time also should be visible. Also, on de-loading side in double door sterilizer, there should be touch screen of 5"-7" for operator's ease.
	3	Access to other functions such as setting parameters, calibration servicing and maintenance is controlled using pre-defined access level which prevents unauthorized access.
	4	The control system should have built in Linearization to correct the individual characteristics of each type of sensors.
	5	Control system should have built in battery backup so that it can support the controller and operator panel in case of power loss.
F.	Automatic Operation with thermal/ laser Printer:	
	1	The sterilizer shall be fitted with suitable PLC (Microprocessor) for fully automatic cycle operation instead of manual operation.
	2	Cycle documentation- The sterilizer should be equipped with an alpha-numeric Laser/thermal printer which prints each cycle parameter performed by the sterilizer. The measured values of temperature and pressure are printed at fixed time intervals, according to various phases of the sterilization process such as 4 minutes time interval for vacuum, 1 minute time interval for sterilization, and the start and end time of the drying phase.
	3	All these time intervals should be user defined. Vendor should supply customized time intervals as desired by the user prior to order delivery.
G.	Alarms should be Audio & Visual: -	
	1	The Control System should have comprehensive alarm/ alert systems which automatically trigger pre-programmed information alerts (preventive maintenance schedule etc).
	2	In the event of any deviation in the type tested cycle, the control system should register an alarm.
	3	<p>The range of alarms should include</p> <ul style="list-style-type: none"> <li>• Temperature &amp; Pressure sensor failure</li> <li>• Phase time-outs</li> <li>• Door(s) not properly closed</li> <li>• Power failure (less than 10 seconds will be ignored)</li> <li>• Continuous self-checking of all safety devices</li> <li>• Low water level (seal water to vacuum pump)</li> </ul>

  
 Dr. Sunil Kr. Singh  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

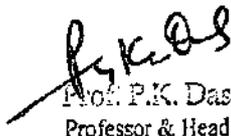
  
 Dr. Manodeep Sen  
 Professor  
 Department of Microbiology  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

	4	The sterilizer should be equipped with following Pre-programmed cycles Programs should include: <ul style="list-style-type: none"> <li>• Wrapped solid and hollow instruments, textiles, porous load (134°C), Type tested program for sterilization of medical devices, e.g. textiles, utensils.</li> <li>• Wrapped, heat sensitive solid and hollow goods, rubber, plastic, porous load (121°C).</li> <li>• Bowie &amp; Dick Test</li> <li>• Automatic Leak rate test</li> <li>• Heavy load (134°C).</li> <li>• Specific goods (134°C).</li> </ul>
H.	Temperature and Pressure Sensors: -	
	1	The sterilizer should have at least 2 temperature & pressure sensors one at chamber drain & one in Jacket. It should also have temperature & pressure sensor in chamber.
	2	The sensors should be PT100 sensors to confirm class A of the IEC 751 standard. with accuracy of $\pm 0.0^\circ\text{C}$ while the pressure sensor should have the accuracy of 1% pressure & pressure sensor in chamber.
	3	Each sensor circuit should be calibrated with individual constants to correct the deviation in manufacturing and aging.
I.	Loading/Unloading System: -	
	1	The sterilizer should come with standard accessories like sterilization basket, basic insert, guiding rail for rack, grid tray, startup kit, transport and loading trolley etc. The sterilizer should be complete with side and top panels.
	2	Sterilizer should have the two rails for easy loading, shelf rack with shelves (carriage) with 1 set of loading and unloading trolley from the manufacturer.
J.	Water Consumption: - Specify water consumption levels.	
	1	R.O. System of 500ltrs. /hrs. should be quoted with pressure.
K.	Authorization, warranty, CMC & uptime clause  Authorization letter and Compliance to above specification from the manufacturer must be submitted along with following points in the bid document: -	
	1	The manufacturers should have at least 10 installations of steam sterilizer in India with reputed govt. hospitals. Performance/Satisfactory installation reports should be enclosed with the bid.
L.	Following accessories are also required for CSSD functionality to be supplied with sterilizer: -	Qty.
	A. Heavy duty Closed Transport Trolley from three sides with 3shelves for distribution of sterile packing made of S.S. Sheet 304 (Size:45" H x 25.5"D x 42"W)	04 Nos.
	B. Heavy duty Revolving Stool with Cushion Top & back	06. Nos.
	C. Sterilization Containers having ISO 13485/ ISO	

  
 Dr. Sunil Kr. Singh  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
 Dr. M. L. Singh  
 Professor  
 Department of Microbiology  
 Dr. R.M.L.I.M.S., Lucknow

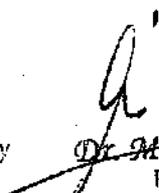
  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

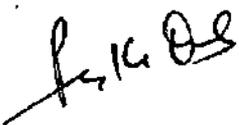
	<p>9001:2015/ISO 17665/ ISO 11607 to be Supplied should be with hinge-less opening button, Thermoloc Bottom with condensate drain (valve), Lid made of high-performance plastic PPSU or anodized aluminum, lid should have silicon lip gasket with reusable microbial barrier filter.</p> <p>The sterilization container handle should have low heat conductivity and heat storage properties and also have indicator to show completion of sterilization cycle, the indicator turns to green, &amp; as soon as the opening button is pushed the indicator turns to red and also</p>	
	Approx Size of sterilization Container to be supplied: 60cm x 30cm x 30cm	05 Nos.
	30cm x 30cm x 30cm	10 Nos.
	30cm x 30cm x 07cm	05 Nos.

**Certifications:**

1. Instruments must be ISO certified and a copy should be enclosed. (The ISO Certificate must be issued by any organization accredited by the Bureau of Indian Standard or accredited by the international accrediting forum "IAF" (Certificate to be attached).
2. Should be USA FDA and/or European CE be approved by 4 digits notified body.

  
Dr. Sunil Kr. Singh  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Mandar Sen  
Professor  
Department of Microbiology  
Dr. R.M.L.I.M.S., Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**DOUBLE DOOR STEAM STERILIZER**

Sno	Specifications
A.	Capacity: Chamber volume double door (900-1000lts.) / 32-36 cu. ft. Double Door Steam Sterilizer: (Qty. -01 No.) Double Door Steam Sterilizer should be automatically PLC controlled and should be horizontal in size with pre and post-vacuum treatment having chamber capacity of approx. 900-1000lts (Approx 32-36 cu. ft). The sterilizer should have ergonomic and user-friendly design with in-built to use touch screen at ergonomic height for user & inbuilt electric Steam Generator and vacuum pump.
B.	Door & Door Safety Systems: -
1	The sterilizer should have automatic double door with pneumatically operated vertical/horizontal sliding doors (Manual opening in case of automatic mechanism failure), Pneumatic door cylinder should be in stainless steel for eliminating the risk.
2	Pressure monitoring system should be available in the chamber to monitor the chamber pressure before opening of the door. Chamber should be completely depressurized before the door seal is retracted by vacuum. Should have an essential safety feature that when the door seal is retracted the chamber is completely vented to atmosphere while the door is still retained in the fully closed and mechanically locked position.
3	Door safety to prevent starting of process unless the door is closed and opening of door when the chamber is pressurized.
4	The door seal should be made of silicon rubber gasket & on commencement of the process the door gasket is pressed against the rear face of the door by Air to ensure the door remains closed during the process
5	A mechanical safety edge stops the door i.e. Emergency stop should be there for extra door safety mechanism to protect staff from force of the door.
6	IBR/ ISO approved pressure-reducing valves with gauges; the tenderer should provide traps in lines and safety valves for jacket and chamber for over pressure safety.
C.	Construction:- The chamber, doors and steam generator should be made of solid, high quality 316L Stainless Steel. Water level indicator should be made of Stainless Steel and jacket should be made of high graded SS-316L/316 Ti with pressure gauge.
1	Mounting: The chamber should be jacketed to ensure the temperature uniformity in chamber. The chamber floor should be slightly sloped towards an internal drain to facilitate drainage. A stainless-steel mesh strainer protects the drain port from blockage by debris. The chamber should be mounted on a stainless-steel frame work with height adjustable feet.
2	Insulation: The sterilizer jacket, doors & steam generator should be completely insulated with 50 to 80mm chloride free mineral wool thereby keeping the autoclave cool on the outside. The insulation should be

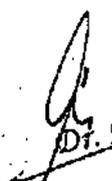
Dr. Sunit Kr. Singh  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

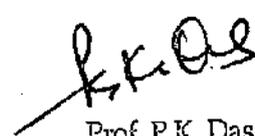
Dr. Manoj Kumar Das  
Professor  
Department of Microbiology  
Dr. R.M.L.I.M.S., Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

	completely encased in removable rigid aluminum/SS 316 sheet housing.
3	Steam Supply (Steam Generator): The sterilizer should have an inbuilt steam generator of adequate capacity. It should be mounted under the sterilizer chamber & should be made of SS316L. The steam generator pressure vessel should be made of stainless steel. The sterilizer should be equipped with dual water connections for different water quality for cooling water and steam generator. All connecting pipes and valves shall be made of good quality stainless steel. Process valves should be pneumatic.
4	It should have a built-in thermostat, pressure safety valve & water level glass gauge inspection device or water level indication on screen visible from service area.
5	Firm to mention installation space required, loading system (floor or semi floor/trolley and loading rack) offered, power supply input and fuse protection & its consumption for control process & vacuum pump.
6	Firm to confirm the size of steam supply line, steam consumption, size of water supply line, drain, exhaust and compressed air line required.
D.	Vacuum Pump, Pipes, Valves & Components:- The sterilizers should have a high-capacity efficient liquid ring vacuum pump. It should be mounted on vibration isolator for quiet operation. It should be connected to condensers to assist air removal. It should also have low water level alarm to protect it from dry run.
1	The piping system should be made of Stainless Steel/ Brass/Copper/ AISI 316L.
2	All the process valves should be stainless steel or Copper Valves or Red Brass Valves or AISI 316L & should be pneumatically/ electrically operated piston valves for loner trouble free operations.
3	All the non-standard components should be non-proprietary & should be easily sourced.
4	All the hot pipes should be properly insulated. Safety valves should be made of brass/copper/stainless steel.
5	Primary piping & fitting should be stainless steel
6	Primary components: 316 quality triclamps or threaded fitting components like-manual valve, non-return valve, pressure regular, pneumatic valves etc.
7	Electrical Components: the terminals & contacts should be housed in a water tight cabinet while the other electrical component should be directly mounted on sterilizer.
8	Air Filter: Air filter should be provided for filtering the atmospheric air before entering inside the chamber. The filter separation efficiency should be higher than 99.9988% for particle size less than 0.3µm. Air filter should be covered under warranty and CMC period.
9	Should pass a hollow load (A) test (Batch monitoring system)
10	Steam Sterilizer should have provision for connecting a ¾ " line terminating in the shutoff valve, none turn valve, Pressure relief valve, steam riser, condensate drain and other essential accessories (for future steam connection from the central boiler).
11	In case tenderer offering standalone steam generator they should provide alternatives for ensuring clean steam (as per International Standards)

  
 Dr. Sunil Kr. Singh  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

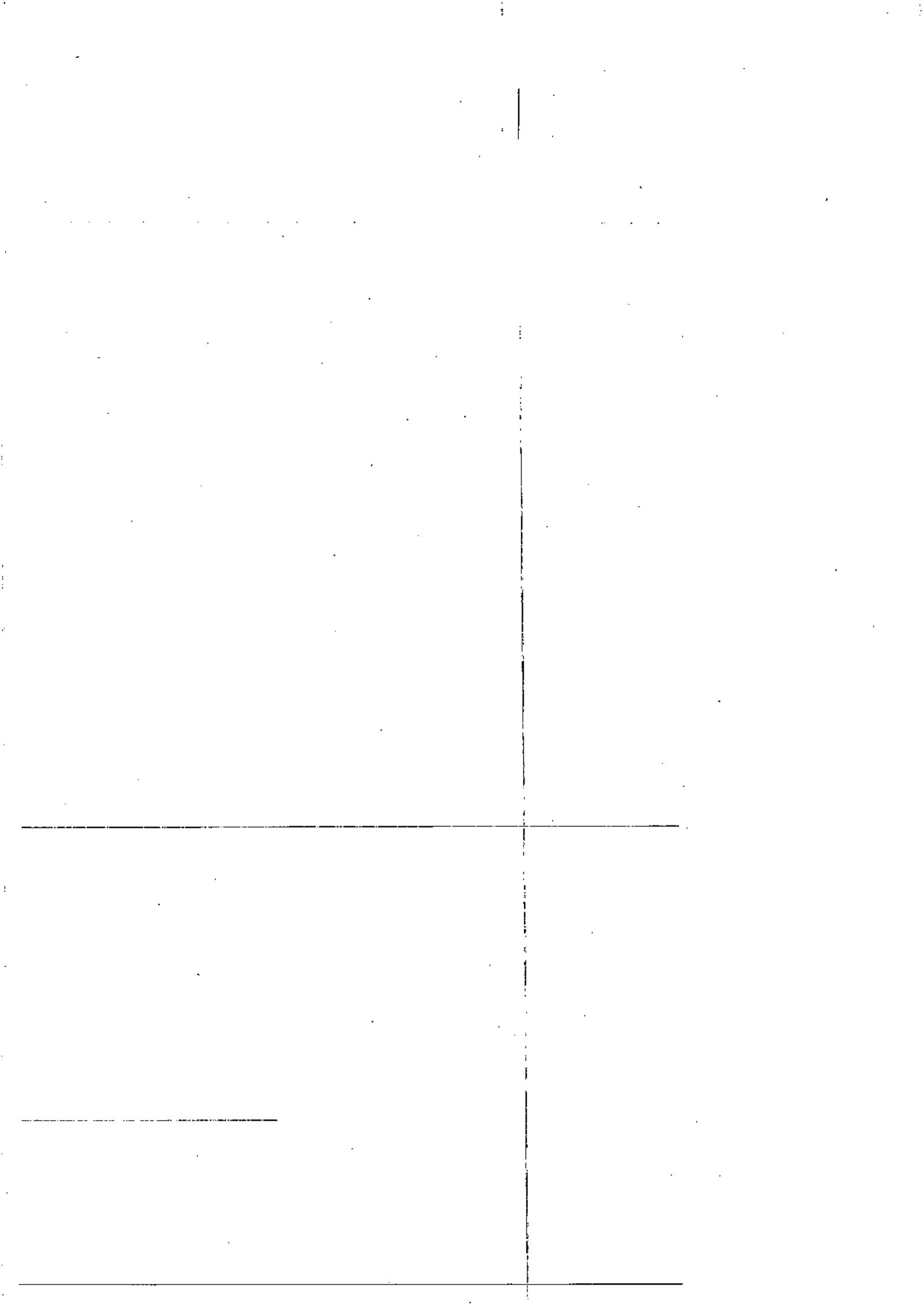
  
 Dr. Manojdeep Sen  
 Professor  
 Department of Microbiology  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

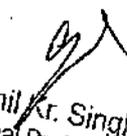
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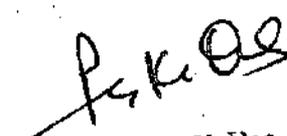
Dr. P.K. Das  
Professor & Head  
Anaesthesiology & CCM  
ALIMS, Lucknow



	12	High vacuum compressor with recycling facility.
E.	Control System & Operating Panel: -	
	1	The sterilizer should be equipped with Microprocessor PLC control system which is dedicated to control the sterilizer including Digital Input Output for Sterilizer control Analog measuring Inputs COM ports for printer & PC communications. The Control System is operated via access code.
	2	8 to 10" Colour touch screen to provide well-arranged simple service controls on loading side. As a default the operator should have access to select cycle, start cycle & to close door. Digital display of chamber pressure, temperature, cycle no., Batch no., Time & date, Alarm Indicator, Low water indicator. Remaining cycle time also should be visible. Also, on de-loading side in double door sterilizer, there should be touch screen of 5"-7" for operator's ease.
	3	Access to other functions such as setting parameters, calibration servicing and maintenance is controlled using pre-defined access level which prevents unauthorized access.
	4	The control system should have built in Linearization to correct the individual characteristics of each type of sensors.
	5	Control system should have built in battery backup so that it can support the controller and operator panel in case of power loss.
F.	Automatic Operation with thermal/laser Printer:	
	1	The sterilizer shall be fitted with suitable PLC (Microprocessor) for fully automatic cycle operation instead of manual operation.
	2	Cycle documentation- The sterilizer should be equipped with an alphanumeric Laser/thermalprinter which prints each cycle parameter performed by the sterilizer. The measured values of temperature and pressure are printed at fixed time intervals, according to various phases of the sterilization process such as 4 minutes time interval for vacuum, 1 minute time interval for sterilization, and the start and end time of the drying phase.
	3	All these time intervals should be user defined. Vendor should supply customized time intervals as desired by the user prior to order delivery.
G.	Alarms should be Audio & Visual: -	
	1	The Control System should have comprehensive alarm/ alert systems which automatically trigger pre-programmed information alerts (preventive maintenance schedule etc).
	2	In the event of any deviation in the type tested cycle, the control system should register an alarm
	3	<ul style="list-style-type: none"> <li>• The range of alarms should include</li> <li>• Temperature &amp; Pressure sensor failure</li> <li>• Phase time-outs</li> <li>• Door(s) not properly closed</li> <li>• Power failure (less than 10 seconds will be ignored)</li> <li>• Continuous self-checking of all safety devices</li> <li>• Low water level (seal water to vacuum pump)</li> </ul>

  
 Dr. Sunil Kr. Singh  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
 Professor  
 Department of Microbiology  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

	4	The sterilizer should be equipped with following Pre-programmed cycles Programs should include: <ul style="list-style-type: none"> <li>• Wrapped solid and hollow instruments, textiles, porous load (134°C). Type tested program for sterilization of medical devices, e.g. textiles, utensils.</li> <li>• Wrapped, heat sensitive solid and hollow goods, rubber, plastic, porous load (121°C).</li> <li>• Bowie &amp; Dick Test</li> <li>• Automatic Leak rate test</li> <li>• Heavy load (134°C).</li> <li>• Specific goods (134°C).</li> </ul>	
H.	Temperature and Pressure Sensors: -		
	1	The sterilizer should have at least 2 temperature & pressure sensors one at chamber drain & one in Jacket. It should also have temperature & pressure sensor in chamber	
	2	The sensors should be PT100 sensors to confirm class A of the IEC 751 standard, with accuracy of $\pm 0.0^\circ\text{C}$ while the pressure sensor should have the accuracy of 1% pressure & pressure sensor in chamber.	
	3	Each sensor circuit should be calibrated with individual constants to correct the deviation in manufacturing and aging.	
I.	Loading/ Unloading System: -		
	1	The sterilizer should come with standard accessories like sterilization basket, basic insert, guiding rail for rack, grid tray, startup kit, transport and loading trolley etc. The sterilizer should be complete with side and top panels.	
	2	Sterilizer should have the two rails for easy loading, shelf rack with shelves (carriage) with 1 set of loading and unloading trolley from the manufacturer.	
J.	Water Consumption: Specify water consumption levels. <ul style="list-style-type: none"> <li>• R.O. System of 500ltrs./hrs. should be quoted with pressure.</li> </ul>		
K.	Authorization, warranty, CMC & uptime clause Authorization letter and Compliance to above specification from the manufacturer must be submitted along with following points in the bid document:- <ul style="list-style-type: none"> <li>• The manufacturers should have at least 10 installations of steam sterilizer in India with reputed govt. hospitals. Performance/ Satisfactory installation reports should be enclosed with the bid.</li> </ul>		
L.	Following accessories are also required for CSSD functionality to be supplied with sterilizer:	Qty.	
	A. Heavy duty Closed Transport Trolley from three sides with 3shelves for distribution of sterile packing made of S.S. Sheet 304 (Size: 45" H x 25.5" D x 42" W)	04 Nos.	
	B. Heavy duty Revolving Stool with Cushion Top & back	06 Nos.	
	C. Sterilization Containers having USFDA EN-CE/EN ISO 13485/ ISO 9001:2015/ ISO 17665/ ISO 11607 to be Supplied should be with hinge- less opening button, Thermoloc Bottom with condensate drain (valve), Lid made of high-performance		

  
 Dr. Sunil Kr. Singh  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
 Dr. Manojeep Sen  
 Professor  
 Department of Microbiology  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

	<p>plastic - PPSU or anodized aluminum, lid should have silicon lip gasket with reusable microbial barrier filter.</p> <p>The sterilization container handle should have low heat conductivity and heat storage properties and also have indicator to show completion of sterilization cycle, the indicator turns to green, &amp; as soon as the opening button is pushed the indicator turns to red and also</p>	
	Approx Size of sterilization Container to be supplied: 60cm x 30cm x 30cm	05 Nos.
	30cm x 30cm x 30cm	10 Nos.
	30cm x 30cm x 07cm	05 Nos.

**Certifications:**

1. Instruments must be ISO certified and a copy should be enclosed. (The ISO Certificate must be issued by any organization accredited by the Bureau of Indian Standard or accredited by the international accrediting forum "IAF" (Certificate to be attached).
2. Should be USA FDA and/or European CE be approved by 4 digits notified body.

  
 Dr. Sunil Kr. Singh  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
 Dr. Manodeep Sen  
 Professor  
 Department of Microbiology  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## Chest Ironer

Chest Ironer Size: 800 x 3000 (Dia x Length)

### Movable Chest Major Features

Industrial chest type ironer with fixed roller and movable chest.

Uniform pressure throughout the entire width, ensuring high ironing quality

Simple and reliable drive ensures easy operation and hassle-free maintenance

Spring press and padding come standard with all models and ensures a uniform roll and chest contact

Moisture is removed by a strong suction blower

Rockwool insulation ensures minimum heat loss and increases thermal output significantly

Industrial chest type ironer with movable roller and fixed chest

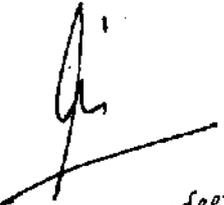
Control panel consists of digital speed indicator, ironing speed regulator, ironing temperature controller, Start and Stop buttons as well as an emergency stop push button.

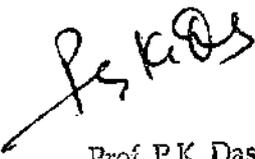
Constructed with special grade materials, machined, polished and hard chrome plated to protect from rusting and for best ironing finishing. These chests are tested with a pressure of up to 21 Bar.

Ironing speed is controlled through a reduction gear box which is driven by a variable frequency drive (inverter).

Controls the speed of the ironer through VFD. It indicates the current drawn by the motor. Also shows any error such as overload or overcurrent.

  
Dr. Sunil Kr. Singh  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Manodeep Sen  
Professor  
Department of Microbiology  
Dr. R.M.L.I.M.S., Lucknow

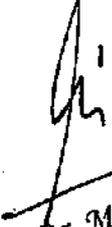
  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

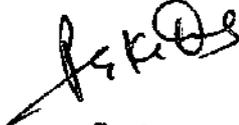
## Heat Sealing Machine

### Features:

- Stainless steel cover, LCD. Input and edit data by pressing keypad.
- Print out six items, Steri. Date, Exp. Date, Bag name, Autoclave No., Cycle No. and Operator No.
- The above items can be printed in English, Chinese or symbols while the input text can be printed in English and/or Arabic numerals.
- Three levels of fonts, word space and text start point are available for selection. Print-out of single line is at minimum line length of 65mm when seven items are all printed;
- Single or multiple items can be selected to be printed;
- Printing can be paused while the sealing function remains;
- Total sealing width: 12mm, with four sealing tracks;
- Sealing speed: 10m/min.
- The temperature setting ranges from 30°C to 230°C with a difference  $\pm 1\%$ ;
- \*Internal timer, auto-calendar and safety temperature meter.
- \* Feeding depths are adjustable to limit the unsealed brim between 0 and 35mm.
- Automatically regulating the sealing pressure meets different thickness of pouches;
- Feeding can be automatically started, and a power saving standby mode is automatically switched on when there is no more feeding within 120 minutes by a preset timer;
- Replace the ink ribbon through the front of machine.
- Built-in dot matrix printer.
- Comply with ISO 11607 Standard.

  
 Dr. Sunil Kr. Singh  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
 Dr. Manodeep Sen  
 Professor  
 Department of Microbiology  
 Dr. R.M.L.I.M.S., Lucknow

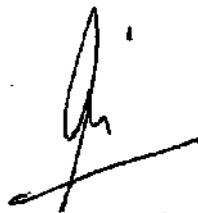
  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## Documentation Labeller

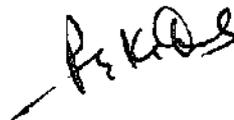
The Documentation Label Gun can print 3 print lines. Each print line can be numerical or alphanumerical. Labels for CSSD documentation are made in double adhesive support and with Type 1 process indicators according to EN ISO 11140-1. The labels are produced with indicators for DECONTAMINATION, STEAM, EO and PLASMA sterilization. The following information can be printed on the tracking labels: • Sterilization date • Expiry date • Operator • Sterilization cycle number • Batch/Lot number • Product number • Sterilizer code



Dr. Sunil Kr. Singh  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow



Dr. Manodeep Sen  
Professor  
Department of Microbiology  
Dr. R.M.L.I.M.S., Lucknow



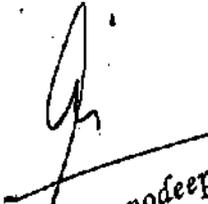
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**Pass Box**

- Size: 600x600x600mm, internal
- Area: Dirty to Clean supply.
- Will be made up of SS 304 sheets with double wall construction
- Will have UV lights for safe storage of components
- UV light will automatically switch off when any one door is opened.
- Pass-through chamber will be based on pneumatic/ electrical operated and will fit all types of standard racks.
- The control will feature two modes of operation to open or close the hatch with a press button mechanism.
- Will have door interlocking to prevent simultaneous opening of both the doors Will have toughened glass panelling for easy visibility.



Dr. Sunil Kr. Singh  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow



Dr. Manodeep Sen  
Professor  
Department of Microbiology  
Dr. R.M.L.I.M.S., Lucknow



Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Sterilization Container

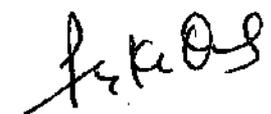
Bio-barrier sterilization containers are used to sterilize, preserve and transport implants, surgical instruments, surgical equipment and textiles in a sterile manner. The container consists of two main parts: box and lid. The box and lid main bodies are pressed from 1050 quality aluminum as a single piece. No welding is used during production in boxes and lids. Decorative anodization is applied to the box and lid surfaces to increase their resistance to external factors. There are color options on the lids. There are holes for air passage on the lid surface, silicone seal that provides air and water tightness from the inner edge, spring locks that provide locking to the box on both sides of the lid in the central position on the inner surface of the lid. There are label attachment compartments, carrying handles and lock parts that the plastic disposable safety lock passes through on both sides of the box. Silicone mat, sheet metal basket, wire basket and labels are used as auxiliary materials together with the containers. They are produced in various types and sizes pre-designed according to the needs of the users. The Bio-Barrier model is a mechanical filter system. The aim of the bio barrier system of these container covers is to enable easier disassembly. The mechanical valve system on the cover allows steam to enter and provide sterilization with the given pressure. Thanks to this system, there is no need to use any filters. Thanks to the valves, it provides a more comfortable and long sterilization and post-sterilization convenience.

### BIO-BARRIER Sterilization Container Size:

285X280X100 MM  
 285X280X135 MM  
 285X280X150 MM  
 285X280X200 MM  
 465X280X100 MM  
 465X280X135 MM  
 465X280X150 MM  
 465X280X200 MM  
 580X280X100 MM  
 580X280X135 MM  
 580X280X150 MM  
 580X280X200 MM

  
 Dr. Sunil Kr. Singh  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
 Dr. Manodeep Sen  
 Professor  
 Department of Microbiology  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

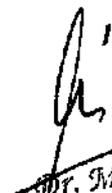
## Sterilization Container

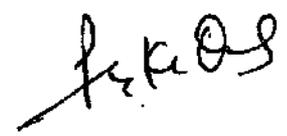
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 Dr. Sunil Kr. Singh  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
 Dr. Manodeep Sen  
 Professor  
 Department of Microbiology  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## ULV Fogger

### Features:

8 Ltr HDPE Tank (Engg. Grad Plastic), SS316 Nozzle + Fix Flow, Digital Timer With Delayed Time Function

Premium Advance Fogger Series Model ( Best in Class with User Friendly) With All Advance Features

New AIR-JET Nozzle for Uniform Sub-Micron Particles and Throw > 40 Fts.

Air-Jet Nozzle Compatible with all Eco-Friendly Disinfectant which are available in Market

New Tank Design User Friendly Fill Chemical Without any Funnel and Exhausted without Opening Tank Wing Nut.

Mechanical Timer (Model: Digito-Meter) Auto-Cut off Function.

Superior High-Grade Motor for Larger Area Coverage.

Superior Three Stage Air-Filtration System

### Specification:

Nozzle System Air-Jet Nozzle (Advance Thrust Design)

Nozzle Material SS 316 Grade

Air Filter Triple Stage with Clamp

Chemical Tank Capacity 8 Litre

Droplet Size Uniform Sub-Microns

Frequency 50/60 Hz

Motor Speed 24,000 RPM

Area Converge More Than 20,000 Cubic. Fts

Noise Level 88 db @ 1 Meter

Tank MOC HDPE

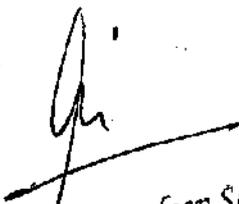
Liquid Flow Rate 1-3 Ltrs. / Hr (Fixed Flow)

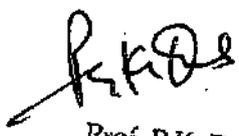
Delayed Time Delayed Start To Leave The Premises & Auto Off Operations.

Timer Devices Mechanical Timer (1 to 60 Min)

Voltage 230 V AC

  
Dr. Sunil Kr. Singh  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Manodeep Sen  
Professor  
Department of Microbiology  
Dr. R.M.L.I.M.S., Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

# Dentistry

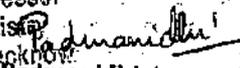


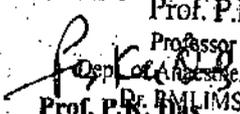
**Declaration Certificate about Technical Specifications  
related to Department of ~~DENTISTRY~~ by  
committee members**

SR. NO.	NAME OF EQUIPMENT	GO NUMBER	APPROX. COST
1.	APEX LOCATOR	GO-28-JAN-18 SUCHI-2	1 LACS
2.	AUTOCLAVE	GO-28-JAN-18 SUCHI-2 GO-23-AUG-18 SUCHI-4	2 LACS
3.	BONE CUTTING SYSTEM (PIEZOELECTRIC)	GO-7-DEC-2022	4 LACS
4.	B-TYPE AUTOCLAVE (DENTAL STERILIZER)	GO-28-JAN-18 SUCHI-2	3 LACS
5.	COMPRESSOR (DENTAL)	GO-23-AUG-18 SUCHI-4	50,000/-
6.	DENTAL AIROTOR HANDPIECE	GO-23-AUG-18 SUCHI-4	30,000/-
7.	DENTAL CHAIR (BASIC)	GO-7-DEC-2022	1.5 LAC
	DENTAL CHAIR (AUTOMATIC)	GO-7-DEC-2022	9 LACS
8.	DENTAL DIGITAL ENDOMOTOR/ ENDO MOTOR (CUTTING DRILL- DENTAL)	GO-28-JAN-18 SUCHI-2 GO-7-DEC-2022	2 LACS
9.	DENTAL ENDOMOTOR	GO-28-JAN-18 SUCHI-2	1 LAC
10.	DENTAL X-RAY MACHINE	GO-28-JAN-18 SUCHI-2	2 LACS
11.	DIGITAL OPG AND CEPHALOMETRY UNIT	GO-23-AUG-18 SUCHI-4	18 LAC
12.	ELECTRICALLY OPERATED DENTAL CHAIR	GO-23-AUG-18 SUCHI-4	5 LACS
13.	IMPLANT KIT (WITH PHYSIO DISPENSER)	GO-7-DEC-2022	4 LACS
14.	INSTRUMENT OF DENTAL DEPARTMENT	GO-23-AUG-18 SUCHI-4	1 LACS
15.	PRESSURE MOULDING MACHINE	GO-28-JAN-18 SUCHI-2	2.5 LACS
16.	RADIO VISIOGRAPHY (RVG)/ RVG (RADION VISIO GRAPHY)	GO-23-AUG-18 SUCHI-4 GO-23-AUG-18 SUCHI-4	4.5 LACS
17.	SOFT TISSUE DIODE DENTAL LASER	GO-23-AUG-18 SUCHI-4	8 LACS
18.	U.V. ASEPTICIZER	GO-7-DEC-2022	50,000/-
19.	ULTRASONIC SCALER (DENTAL SCALER)/ ULTRASONIC SCALER	GO-28-JAN-18 SUCHI-2 GO-23-AUG-18 SUCHI-4	40,000/-
20.	ULTRASONIC CLEANING SYSTEM	GO-28-JAN-18 SUCHI-2	3 LACS
21.	VISTA SCAN	GO-28-JAN-18 SUCHI-2	5 LACS

This is to certify that technical specification of all the above-mentioned machine/instruments, approved by the technical committee is not of any specific company. The technical features of the equipment/instruments from all reputed firms in the current market have been included in this specification to the best of my knowledge and belief & in the opinion of the technical committee.

The technical specification duly signed by the technical committee members is attached herewith.

Dr. Padmanidhi Agarwal  
MDS (Oral and Maxillofacial Surgery)  
Associate Professor  
Dept. of Dentistry  
Dr. RMLIMS, Lucknow  
  
Dr. Padmanidhi Agarwal  
Assistant Professor  
Department of Dentistry  
DR RMLIMS, Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anesthesiology & CCM  
Dr. RMLIMS, Lucknow  
  
Prof. P.K. Das  
Chairman  
Technical specifications committee  
Clinical Subjects & others  
Head, Department of Anesthesiology & CCM  
DR RMLIMS, Lucknow

## APEX LOCATOR

S. No	Technical Specifications
1.General	High-precision root canal measurement
	Auto-detects the apex accurately in any conditions, dry or wet
	A stylish and compact body requiring only a small space. Can be located on the dental equipment console
	Three different alert sounds depending on the location of the file tip, ensuring precise procedures
	Energy saving & low operation cost
	Great accuracy in wet or dry canal
	has multi-frequency measuring technology
	User friendly interface
2.Display	A big 3 colour LCD panel with very low reflectivity, allows Clinicians to accurately & instantly monitor procedures
	Large Hi-contrast LCD screen
3.Safety	Audible warning system
Features	Auto power shut-off
Certification	Comply with latest European CE or US FDA Certifications/conformity.

Scope of Supply: Portable Apex locator with handpiece and inbuilt LED screen.

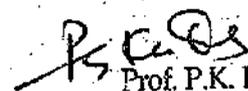
*Padmanidhi*  
 Dr. Padmanidhi Agarwal  
 MDS (Oral and Maxillofacial Surgery)  
 Associate Professor  
 Dept. of Dentistry  
 Dr. RMLIMS, Lucknow

*P. K. Das*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## AUTOCLAVE

S. No	Technical Specifications
1. Sterilization Method:	<p><b>High-Pressure Steam Sterilization:</b></p> <ul style="list-style-type: none"> <li>The autoclave uses high-pressure steam to reach temperatures between 121°C (250°F) and 134°C (273°F).</li> <li>The pressure typically ranges from 15–30 psi depending on the temperature setting.</li> </ul>
2. Temperature and Pressure Control:	<ul style="list-style-type: none"> <li><b>Temperature:</b> Autoclaves generally operate between 121°C to 134°C</li> <li><b>Pressure:</b> The pressure inside the chamber can range from 15 to 30 psi.</li> <li><b>Control Mechanism:</b> Most autoclaves allow precise control over both temperature and pressure, ensuring that the sterilization process is consistent and effective.</li> </ul>
3. Cycle Time	<b>Cycle Length:</b> Should have different cycles short and long of time about 5 min to 1 hour at different temperatures
4. Capacity	Pressure cooker-type autoclaves capacity between 18 liters to 30 litres.
5. Material Construction:	<p><b>Stainless Steel Chamber:</b> Autoclaves typically feature a stainless steel chamber for durability, resistance to corrosion, and ease of cleaning.</p> <p><b>Outer Housing:</b> Usually made from powder-coated steel or stainless steel to ensure sturdiness and long-lasting performance.</p>
6. Heating System	<ul style="list-style-type: none"> <li><b>Electric or Steam Heating</b> using an electric heating element to generate steam.</li> <li><b>Efficient Heating:</b> The system is designed to heat the chamber quickly to the required temperature and pressure.</li> </ul>
7. Water Supply:	<ul style="list-style-type: none"> <li><b>Water Reservoir:</b> internal water reservoir to generate steam.</li> <li><b>Distilled Water:</b> distilled or deionized water to avoid mineral buildup and ensure the longevity of the machine.</li> <li><b>Automatic or manual filling.</b></li> </ul>
8. Control System:	<ul style="list-style-type: none"> <li><b>Digital Control Panels:</b> Controls with LCD/LED displays for setting sterilization parameters and monitoring the process.</li> <li><b>Cycle Timer:</b> Autoclaves typically include a timer that controls the sterilization duration and displays the progress.</li> <li><b>Automatic Start/Stop:</b> Most models have automatic cycle start and stop functions for easy operation.</li> </ul>
9. Safety Features:	<ul style="list-style-type: none"> <li><b>Pressure Relief Valve:</b> Ensures that the pressure does not exceed the safe limits, preventing accidents and ensuring safe operation.</li> <li><b>Automatic Locking System:</b> The door of the autoclave cannot be opened while under pressure, preventing the release of steam and pressure during operation.</li> </ul>

  
 Padma Prakash Agarwal  
 MDS (Oral and Maxillofacial Surgery)  
 Associate Professor  
 Dept. of Dentistry  
 Dr. RMLIMS, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

	<ul style="list-style-type: none"> <li>• <b>Over-Temperature Protection:</b> Protects the unit and instruments from overheating, ensuring that the autoclave doesn't exceed the safe sterilization temperatures.</li> <li>• <b>Steam Pressure Gauge:</b> Displays the internal pressure to help users monitor the process.</li> </ul>
10. Drying System:	<ul style="list-style-type: none"> <li>• <b>Drying Function:</b> a drying cycle after the sterilization process to ensure that instruments are dry and ready for use.</li> <li>• <b>Ventilation:</b> After the sterilization cycle ends, the system may vent excess steam to allow the chamber and instruments to cool and dry.</li> </ul>
11. Manual Controls:	<ul style="list-style-type: none"> <li>• <b>Manual Buttons or Push-Buttons</b> for controlling the start and stop of the sterilization cycle.</li> </ul>
12. Maintenance and Cleaning:	<ul style="list-style-type: none"> <li>• <b>Removable Trays:</b> with removable trays or baskets for organizing instruments.</li> <li>• <b>Filter Systems:</b> Some models include filters to remove impurities from the water used in the sterilization process.</li> </ul>
13. Size and Weight:	<ul style="list-style-type: none"> <li>• <b>Compact or Benchtop Models:</b> Smaller units are lightweight and easy to fit on countertops in dental or medical offices.</li> <li>• <b>Larger Models:</b> Bigger units designed for high-volume clinics or hospitals can be bulkier and weigh more.</li> </ul>
14. Compliance and Certifications:	<ul style="list-style-type: none"> <li>• <b>ISO Certifications:</b> Pressure cooker-type autoclaves must meet various ISO standards for medical equipment and sterilization, such as ISO 13485.</li> <li>• <b>FDA or CE marking</b></li> </ul>

**Scope of Supply:** Pressure cooker type powder coated autoclave

2 inset separate s.s. drums

Padma Anjali Agarwal  
 Dr. Padma Anjali Agarwal  
 MDS (Oral and Maxillofacial Surgery)  
 Associate Professor  
 Dept. of Dentistry  
 Dr. RMLIMS, Lucknow

*P.K.D.*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**BONE CUTTING SYSTEM (PIEZOELECTRIC)**

S. No	Technical Specifications
1. General	Peizo Surgery unit should have 70 Watt Maximum Power.
	The Unit should come with 2 Fibre Optic Handpiece with Autoclavable Cassettes for sterilization and storage.
	Should have separate mode for Bone, Perio, Endo & Clean.
	Should be Supplied with all Tips for Bone Cutting, Sinus Lifting & Implantology, endodontics, etc, minimum 1 set each.
2. Display	The unit should have a Touch Colored Display with display for Power, Water Control:
3. Foot Control	Should have control for water supply, Mode and Power Change.
4. Accessory	Should be supplied with irrigation tubing's at least 20.
5. Warranty and Certification	<ul style="list-style-type: none"> <li>Should be supplied with minimum <sup>5</sup> years warranty on the PCB Unit.</li> <li>Should be CE European or US FDA approved.</li> </ul>

Scope of Supply: With Touch Panel, Fibre Optic Motor And Handpiece,

Foot control, irrigation tubings 20 nos.

All tips for Bone Cutting, Sinus Lifting & Implantology, endodontics, 1 set each with separate autoclavable boxes for each set.

*P. Mani*  
**Dr. P. Mani**  
 MDS (Oral and Maxillofacial Surgery)  
 Associate Professor  
 Dept. of Dentistry  
 Dr. RMLIMS, Lucknow

*P. K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**B-Type Autoclave (Dental Sterilizer)**

S. No	Technical Specifications
General	<ul style="list-style-type: none"> <li>The Autoclave should be B-Type</li> <li>Should have 23 litres of tank capacity.</li> <li>Should come with multiple high grade stainless steel trays.</li> <li>Should have Programs like Wrapped, Unwrapped, Prion, Gentle etc.</li> <li>Should have Coloured Touch Screen for controlling the autoclave,</li> </ul>
Safety	Should have inbuilt safety tests like Helix Test & Vacuum Test.
Special Features	Should have separate drum for Fresh Water and Waste water with different vents to empty the tanks.
	Should have standby mode for the autoclave when not in use.
	Should come with Pre & Post Vacuum Cycles.
	Should have a Flash Cycle of 12-15 mins.
	Should be able to autoclave plastic and textiles also.
Warranty	Should have minimum 3 year warranty
Certification	Should be CE European or US FDA approved

Scope of Supply: Autoclave body with leads with touchscreen and set of stainless steel trays with one sapre set of trays-

*Paelman*  
 Dr. Paelman, Agarwal  
 MDS (Oral and Maxillofacial Surgery)  
 Associate Professor  
 Dept. of Dentistry  
 Dr. RMLIMS, Lucknow

*P.K. Das*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

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**COMPRESSOR (Dental)**

S. No	Technical Specifications
1. Power	<ul style="list-style-type: none"> <li>range from 1 to 5 HP.</li> </ul>
2. Airflow (CFM - Cubic Feet per Minute)	<ul style="list-style-type: none"> <li>Airflow needs depend on the number of dental units and equipment. A standard dental compressor typically provides 4-10 CFM at 90 PSI.</li> <li>For a practice with multiple operatories, you may need 12-20 CFM</li> </ul>
3. Maximum Pressure (PSI)	<ul style="list-style-type: none"> <li>operate at 90-120 PSI.</li> <li>100 PSI is a standard operating pressure, but some units go up to 120 PSI for higher-demand equipment.</li> </ul>
4. Tank Size	<ul style="list-style-type: none"> <li>capacity of 3 to 20 gallons.</li> </ul>
5. Noise Level	<ul style="list-style-type: none"> <li>Noise levels -50-70 decibels.</li> <li>low noise features if noise reduction is essential for your practice.</li> </ul>
6. Moisture and Contaminant Filtration	<ul style="list-style-type: none"> <li>filters to remove moisture and contaminants to prevent damage to dental equipment.</li> <li>dry air systems or oil-free compressors that minimize maintenance and contamination.</li> </ul>
7. Power Supply	<ul style="list-style-type: none"> <li>commonly 110V or 220V, variable according to supply of site.</li> </ul>
8. Oil-Free	<ul style="list-style-type: none"> <li>Oil-free compressors, produce clean, dry air that reduces the risk of contamination.</li> </ul>
9. Weight and Dimensions	<ul style="list-style-type: none"> <li>Compact, lightweight design</li> </ul>
10. Maintenance and Durability	<ul style="list-style-type: none"> <li>easy maintenance, with replaceable filters and long-lasting components.</li> </ul>
11. Warranty and Support	<ul style="list-style-type: none"> <li>US FDA or CE certified</li> <li>Should meet ISO standards</li> </ul>

Scope of Supply: Compressor with specifications as given with connections.

*Padma Anithi Agarwal*  
Dr. Anithi Agarwal  
MDS (Dental Radiology & Maxillofacial Surgery)  
Associate Professor  
Dept. of Dentistry  
Dr. RMLIMS, Lucknow

*P. K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

### DENTAL AIROTOR HANDPIECE

S. No	Technical Specifications
1. Speed (RPM - Revolutions Per Minute)	<ul style="list-style-type: none"> <li>Should operate somewhere between 300,000 to 600,000 RPM.</li> </ul>
2. Torque	<ul style="list-style-type: none"> <li>High torque is important for maintaining consistent power under load (e.g., when cutting tough materials).</li> <li>provide steady, consistent torque for efficient performance.</li> </ul>
3. Chuck System	<ul style="list-style-type: none"> <li><b>Push-Button Chuck:</b> This is a common and easy-to-use chuck system, allowing for quick bur changes.</li> </ul>
4. Connection Type	<ul style="list-style-type: none"> <li><b>Quick Connect:</b> Compatible with most dental units, allowing fast attachment and removal.</li> <li><b>Standard 4-Hole/6-Hole:</b> Ensure compatibility with your dental unit's connection system.</li> <li><b>Fiber Optic:</b> may be supplied with fiber optic lights (depending on available chair compatibility), which are crucial for proper illumination in the oral cavity.</li> </ul>
5. Air Pressure	<ul style="list-style-type: none"> <li>work at 30-40 PSI.</li> <li>Pressure regulation should be stable</li> </ul>
6. Noise Level	<ul style="list-style-type: none"> <li>operate around 55-65 decibels.</li> </ul>
7. Weight and Ergonomics	<ul style="list-style-type: none"> <li><b>Lightweight Handpieces</b> between 100 to 150 grams.</li> <li>Ensure the handpiece is designed for comfort, with a well-balanced body and a comfortable grip.</li> </ul>
8. Cooling System	<ul style="list-style-type: none"> <li>A built-in water-spray system is essential to cool both the tooth and the bur during procedures, preventing overheating and reducing patient discomfort.</li> </ul>
9. Material	<ul style="list-style-type: none"> <li>made from stainless steel or titanium for durability and resistance to corrosion.</li> <li>The exterior finish should be smooth for ease of cleaning and sterilization.</li> </ul>
10. Light Source	<ul style="list-style-type: none"> <li><b>Fiber Optic Handpieces:</b> These include built-in lights that provide better visibility, especially for procedures in hard-to-see areas.</li> <li>A bright LED light helps illuminate the treatment area for enhanced precision and ease of use.</li> </ul>
11. Bur	<ul style="list-style-type: none"> <li>Ensure the handpiece is compatible with the burs you plan to use.</li> <li>designed for standard 1.6mm (ISO) burs, but some may require</li> </ul>

*Padmanabhi Agarwal*  
 Dr. Padmanabhi Aggarwal  
 MDS (Oral and Maxillofacial Surgery)  
 Associate Professor  
 Dept. of Dentistry  
 Dr. RMLIMS, Lucknow

*P. K. Das*

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

Compatibility	specific types.
12. Sterilization	<ul style="list-style-type: none"> <li>Handpieces must be able to withstand autoclaving. Ensure the model is designed for easy disinfection, with components that are durable under high heat and pressure.</li> </ul>
13. Durability and Lifespan	<ul style="list-style-type: none"> <li>Handpieces with ball-bearing mechanisms tend to last longer and perform more smoothly compared to other mechanisms.</li> <li>Some brands offer longer warranties for their handpieces, signalling their durability.</li> </ul>
14. Certification	<ul style="list-style-type: none"> <li>ISO standards</li> </ul>

Scope of Supply: Handpiece with 2 sets of all air-rotor burs.

*Padmanabhi Aggarwal*  
 Dr. Padmanabhi Aggarwal  
 MCh (Oral and Maxillofacial Surgery)  
 Associate Professor  
 Dept. of Dentistry  
 Dr. RMLIMS, Lucknow

*P. K. Das*

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**DENTAL CHAIR (BASIC)**

S. No	Technical Specification
General Specifications	<ul style="list-style-type: none"> <li>Electrically or hydraulically operated dental chair.</li> <li>Structure: Heavy-duty metal frame with an anti-corrosive coating.</li> <li>weight Capacity: 150-200 kg.</li> </ul>
2. Chair Movement & Adjustments	<ul style="list-style-type: none"> <li>Chair Positions: Reclining range: 90° to 180° (near-horizontal for surgeries).</li> <li>Height Adjustment: 400 mm to 800 mm (adjustable).</li> <li>Headrest: Adjustable, multi-position, and double-articulated.</li> <li>Armrests: Fixed or detachable for better patient access.</li> <li>Leg Rest: Extendable, foldable, or automatic movement in some models.</li> </ul>
3. Upholstery & Comfort	<ul style="list-style-type: none"> <li>Material: PU leather, memory foam, or synthetic antimicrobial material.</li> <li>Padding: High-density foam for ergonomic comfort.</li> <li>Waterproof &amp; Stain-Resistant: Easy to clean, anti-microbial coating.</li> </ul>
4. Control System	<ul style="list-style-type: none"> <li>Foot Control: Basic up/down and recline adjustment.</li> <li>Multi-function foot pedal (in advanced models).</li> <li>Hand Control: Touch panel or Keypad with preset positions.</li> <li>Safety Lock System: Prevents unintended movement.</li> </ul>
5. Operating Light	<ul style="list-style-type: none"> <li>Type: LED / Halogen.</li> <li>Brightness: Adjustable (10,000 - 50,000 Lux).</li> <li>Rotation: 3-axis movement for better positioning.</li> </ul>
6. Dental Unit Integration	<ul style="list-style-type: none"> <li>Instrument Tray: <ul style="list-style-type: none"> <li>Movable / fixed with auto-return function.</li> <li>Pneumatic locking system for stability.</li> </ul> </li> <li>Handpiece Connections: 2-4 ports for air and electric handpieces.</li> <li>Air/Water Syringe</li> <li>Suction System: Built-in vacuum suction.</li> <li>External suction connection available.</li> </ul>

Dr. Padmanabhi Agarwal  
MDS (Oral and Maxillofacial Surgery)  
Associate Professor  
Dept. of Dentistry  
Dr. RMLIMS, Lucknow

*P.K.D.*

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

7. Water & Spittoon System	<ul style="list-style-type: none"> <li>• Spittoon: Rotatable ceramic or plastic bowl.</li> <li>• Water Supply: Clean water bottle system.</li> <li>• Direct water line connection</li> </ul>
8. Power & Connectivity	<ul style="list-style-type: none"> <li>• Power Supply: 110-240V, 50/60Hz.</li> <li>• Consumption: 500-1500W.</li> </ul>
9. Certification	<ul style="list-style-type: none"> <li>• Should conform to ISO standards.</li> </ul>

Scope of Supply: Dental chair with 2 rotating stools, LED light and spittoon, with instrument tray and handpiece connections.

*Padmanidhi*  
**Dr. Padmanidhi Agarwal**  
 MDS (Oral and Maxillofacial Surgery)  
 Associate Professor  
 Dept. of Dentistry  
 Dr. RMLIMS, Lucknow

*P. K. Das*

**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**DENTAL CHAIR (Automatic)**

S. No	Technical Specification
General	<ul style="list-style-type: none"> <li>▪ Fully motorized, pneumatically / electrically driven, which [gives smooth and non-jerky start and stop.</li> <li>• Lowest height range should be between 300 - 850 mm to [Improve visibility and access.</li> <li>▪ Chair should have toe movement. While backrest moves down, toe should move up</li> <li>• The design should enable the operator to be close to the patient to provide optimum vision of the operating field and safe control of all component devices</li> <li>• The base and other structure should have a corrosion resistant coating with cast metal base.</li> <li>• The backrest should be ultra-thin, flexible, highly comfortable, seamless long-life upholstery and should be disinfectible</li> <li>• The chair should be designed to provide good ergonomics for both operator and assistant</li> <li>• Chair should have adjustable ergonomic headrest</li> <li>• The chair movement control should be at both fingertip panel and user-friendly foot control with all the functions [and should have atleast two patient entry programs 1-rinse, exit program.</li> <li>• Should be over head delivery system with minimum 5 delivery ports for various handpieces, scaler and 3-way syringe</li> <li>• Noise level should be less than 65 dB.</li> <li>• X-Ray double film (14" x17") viewer (LED Based)</li> <li>• High quality stain proof vitreous China bowl/glass bowl with adjustable cup fill and bowl rinse timer</li> <li>• Clean water bottle system</li> </ul>
Assistant side	<ul style="list-style-type: none"> <li>• should have high vacuum, medium vacuum suction and 3 way syringe with spittoon and Tumbler water connections.</li> <li>• The motorized Suction system should be compact, Wetline Suction</li> </ul>

Dr. Pradeep Singh Agarwal  
MDS (Oral and Maxillofacial Surgery)  
Associate Professor  
Dept. of Dentistry  
Dr. RMLIMS, Lucknow

*P.K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

	<p>with flow rate of atleast 250 Ltr/minute.</p> <ul style="list-style-type: none"> <li>• Lifting capacity of dental chair should be at least 180 kgs.</li> <li>• Movable cuspidor box and Movable assistant control system should have: <ul style="list-style-type: none"> <li>• Saliva ejector</li> <li>• Autoclavable High volume evacuator</li> <li>• Autoclavable 3-way syringe</li> </ul> </li> </ul>
Safety	Chair should have safety brake system while going down for patient exit position
Motor	<ul style="list-style-type: none"> <li>• Should be Noiseless DC Motor</li> <li>• Should have Integrated power supply for fiber optic hand pieces, piezo electric motor etc.</li> <li>• Servo Voltage stabilizer of appropriate ratings with Input 160-260 V and output 220-240 V , fitted with Indian plug</li> </ul>
Electrical and Plumbing	<ul style="list-style-type: none"> <li>• Necessary cables and all other accessories those are required for the smooth functioning of the system to be supplied</li> <li>• The handpiece control block should flow through water design to eliminate stagnant water</li> <li>• Should have minimum two high Speed Air Rotor terminals with water control on coupling with at least one fiber optic</li> <li>• All the outlet &amp; inlet for the services to the chair should be concealed in the box to be at the foot area of the chair or within the unit, as an infection control measure</li> <li>• High quality Autoclavable stainless steel quick disconnect water syringe, with 20 extra tips for each chair.</li> </ul>
Necessary Attachments and	<ul style="list-style-type: none"> <li>• One in-built Plezon LED Ultrasonic scaler (frequency 28-36 KHz) with two handpieces</li> <li>• Scaler tips - 3 set each (each set containing 4 tips)</li> </ul>

Dr. Pedmanidhi Agarwal  
MDS (Oral and Maxillofacial Surgery)  
Associate Professor  
Dept. of Dentistry  
Dr. RMLMS, Lucknow

*P.K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLMS, Lucknow

	In service/technical manual.
Warranty and Certification	<ul style="list-style-type: none"> <li>• Manufacturer should have ISO certification for quality standards</li> <li>• The Dental chair and handpieces along with all other accessories should be European CE with 4 digit notified body no. /US FDA certified/BIS certified.</li> <li>• Electrical safety conforms to standards for electrical safety IEC60601-1 (OR EQUIVALENT international/national standard) General requirement for Electrical safety of Medical Equipment.</li> </ul>
Installation and Upkeep	<ul style="list-style-type: none"> <li>• All consumables required for installation and standardization of system to be given free of cost</li> <li>• Log book with instructions for daily, weekly, monthly and quarterly maintenance checklist. The job description of the hospital technician and company service engineer should be clearly spelt out</li> <li>• The supplier would do all the necessary civil, electrical, plumbing other changes required for the effective installation and functioning of the Dental Chair.</li> <li>• Approximately 3 lubrication sprays from OEM to be supplied free of cost every year during warranty and CMC period.</li> </ul>

Scope of supply:

- Dental chair with 2 rotating Operator and Assistant stool, overhead system, light
- One in-built LED Ultrasonic scaler (frequency 28- 36 KHz) with 2 handpieces
- Instrument tray with overhanging attachment of handpieces
- Scaler tips - 3 set each (each set containing 4 tips)
- Perio tips - 3 set each (each set containing 4 tips)
- 3.endo tips set (each set containing 4 tips)
- Fiber optic Air rotor- 2 nos.
- Micromotor straight and contra angle - (2 nos, each)
- Fiber optic Miniature Air rotor handpiece -2 nos.
- Burs/tips for the handpieces both in diamond and tungsten carbide should be provided (20 each) in various shapes and sizes.

3 lubrication sprays

*Padma Prakash Manidhi Agarwal*  
 MDS (Oral and Maxillofacial Surgery)  
 Associate Professor  
 Dept. of Dentistry  
 Dr. RMLIMS, Lucknow

*P. K. Das*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**DENTAL DIGITAL ENDO-MOTOR**

S. No	Technical Specifications
1.General	Optic handpiece and cordless
	Should have an integrated apex locator
	Should have Auto switch work mode
	Should work in both rotary and reciprocation motion
	Should Have Torque range of about 0.5 Ncm to 5.2 Ncm
	Should have Speed 150 RPM to 600 RPM
	Should be able to work in all programs for different choice each program with 5 file setting
	Should have minimum 2 type of auto reverse (torque auto reverse as well as apex setting auto reverse)
	Handpiece should be contra-angle and detachable
	Should have small head size
	LED light
2.Motor	Use dual mode (endo motor with apex locator) and single mode (endomotar or apex locator)
	Gear ratio should be 16:1
	Power (VAC)- 100-240 V
	Power (VDC) -10V
	Frequency 50-60 Hz
Warranty and Certification	Large capacity battery about 1200 Mah
	<ul style="list-style-type: none"> <li>5 years warranty and life time warranty on battery.</li> <li>Manufacturer/ Supplier should have ISO certification for quality standards.</li> </ul>

Scope of Supply: Endomotor box with handpiece and attachment leads

*Padmanabhi Aggarwal*  
 Dr. Padmanabhi Aggarwal  
 MDS (Oral and Maxillofacial surgery)  
 Associate Professor  
 Dept. of Dentistry  
 Dr. RMLIMS, Lucknow

*P.K. Das*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**DENTAL ENDOMOTOR**

S. No	Technical Specifications
<b>General</b>	Ergonomic design
	Should have Auto switch work mode
	Should work in both rotary and reciprocation motion
	Should Have Torque range of about 0.5 Ncm to 5.2 Ncm
	Should have Speed 150 RPM to 600 RPM
	Frequency 50-60 Hz
	Should be able to work in all programs for different choice each program with 5 file setting
	Should have minimum 2 type of auto reverse (torque auto reverse as well as apex setting auto reverse)
	Handpiece should be contra-angle and detachable
	Should have small head size
<b>Motor Specifications</b>	Large capacity battery about 1200 Mah
<b>Warranty and Certification</b>	5 years warranty and life time warranty on battery
	Manufacturer/ Supplier should have ISO certification for quality standards.
	It should be FDA/ CE approved product.

Scope of Supply: Endomotor box with handpiece and attachment leads

*Padmanidhi*  
**Dr. Padmanidhi Agarwal**  
 MDS (Oral and Maxillofacial Surgery)  
 Associate Professor  
 Dept. of Dentistry  
 Dr. RMLIMS, Lucknow

*P. K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

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DENTAL X-RAY MACHINE

S. No	Technical Specifications
X ray generator	<ul style="list-style-type: none"> <li>• It should have high frequency inverter.</li> <li>• It should have about 60v constant tube voltage.</li> </ul>
X ray Tube	<ul style="list-style-type: none"> <li>• It should have tube current of 2mA.</li> <li>• It should have filtration of about 1.5 – 2 mm.</li> <li>• Anode type – Stationary</li> <li>• Anode angle – 12.5</li> <li>• Focal spot – 0.4 mm</li> </ul>
Battery	<ul style="list-style-type: none"> <li>• 2 nos               <ul style="list-style-type: none"> <li>○ It should have more than 2500 mAh, rechargeable lithium ion battery.</li> <li>○ About 200 exposures can be made after single full charge of battery</li> </ul> </li> </ul>
General	<ul style="list-style-type: none"> <li>• Hand-held Portable Dental X-Ray Unit</li> <li>• It should have option for setting preset value for x ray exposure.</li> <li>• It should be cordless and easily transportable.</li> <li>• It should be AERB (Atomic Energy Regulatory Board) Certified.</li> <li>• The company trained / certified engineers have to train the technician and other staff members of the user department following installation of the machine.</li> <li>• Lead apron should be provided (2 in number) for operator and patient protection.</li> </ul>
Warranty and Certification	<ul style="list-style-type: none"> <li>• It should be FDA/ CE approved product.</li> <li>• Manufacturer/ Supplier should have ISO certification for quality standards.</li> </ul>

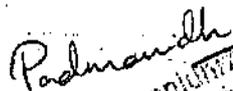
Scope of Supply: hand held portable x-ray machine with 2 lead aprons

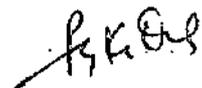
*Padmanabhan*  
Dr. Padmanabhan  
MDS (Oral and Maxillofacial Surgery)  
Associate Professor  
Dept. of Dentistry  
Dr. RMLIMS, Lucknow

*P. K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## DIGITAL OPG AND CEPHALOMETRY UNIT

S. No	Technical Specifications
General Features	Self-adaptive focusing and filters
	Portable type
	Sensor Techonology CMOS
	Connectivity LAN/ Ethernet
	Patient alignment with 3-D Laser Guide
	Exposure time : between 6 to 12 sec
	Accurate, patient-guided positioning and ultra-fast scanning
	Touch buttons
	Servo-assisted control via on-machine keyboard or app for mobile devices.
	Ultra-Fast Scanning within 12 seconds
	In-Depth Clinical Investigation
	Should adapt to all the different needs of a dental/oral surgery
	Touch buttons
	Should provide a selection of editing / measuring programs.
Choice of Multiple Images	
Special Features	Provision to perform Lateral Cephalograms
	With free software installation and upkeep
	Provision for saving on computer/ mailing the obtained radiographs
Attachments	Computer with CPU and attachments with required compatibility for the machine to be provided along with.

  
 Dr. Padmanabh  
 MDS (Oral and Maxillofacial Surgery)  
 Associate Professor  
 Dept. of Dentistry  
 Dr. RMLIMS, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

Additional	Lead apron should be provided (2 in number) for operator and patient protection.
Certification	USA FDA or CE approved. Should conform to ISO standards.
Upgradation Possibility	Possibility of attachment of CBCT in future

Scope of Supply: OPG Machine with Lateral Ceph

with CPU and monitor of required specifications as per machine requirement and other attachments ,

Software

To be supplied with OPG printer machine and 200 films.

Sleeves for single time use intraorally – 200

*Padmanidhi*

Dr. Padmenidhi Agarwal  
MDS (Oral and Maxillofacial Surgery)  
Associate Professor  
Dept. of Dentistry  
Dr. RMLIMS, Lucknow

*P.K. Das*

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## ELECTRICALLY OPERATED DENTAL CHAIR

S. No	Technical Specification
General	<ul style="list-style-type: none"> <li>• Fully motorized, pneumatically / electrically driven, which [gives smooth and non-jerky start and stop.</li> <li>• The design should enable the operator to be close to the patient to provide optimum vision of the operating field and safe control of all component devices</li> <li>• The base and other structure should have a corrosion resistant coating with cast metal base.</li> <li>• The backrest should be ultra-thin, flexible, highly comfortable, seamless long-life upholstery and should be disinfectible</li> <li>• The chair should be designed to provide good ergonomics for both operator and assistant and an ergonomic headrest</li> <li>• The chair movement control should be at both fingertip panel and user-friendly foot control with all the functions</li> <li>• Overhead delivery system with minimum 5 delivery ports for various handpieces, scaler and 3-way syringe</li> <li>• X-Ray double film (14" x17") viewer (LED Based)</li> <li>• High quality stain proof vitreous China bowl/glass bowl with adjustable cup fill and bowl rinse timer</li> <li>• Clean water bottle system</li> </ul>
Assistant side	<ul style="list-style-type: none"> <li>• Should have high vacuum, medium vacuum suction and 3 way syringe with spittoon and Tumbler water connections.</li> <li>• The motorized Suction system should be compact, Wetline Suction with flow rate of at least 250 Ltr/minute.</li> <li>• Lifting capacity of dental chair should be at least 150 kgs.</li> <li>• Movable cuspidor box and Movable assistant control system should have:             <ul style="list-style-type: none"> <li>• Saliva ejector</li> <li>• Autoclavable High volume evacuator</li> </ul> </li> </ul>

*Padmanabhi*  
 Dr. Padmanabhi Dasgupta  
 MDS (Oral and Maxillofacial Surgery)  
 Associate Professor  
 Dept. of Dentistry  
 Dr. RMLIMS, Lucknow

*P.K. Das*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

	<ul style="list-style-type: none"> <li>• Autoclavable 3-way syringe</li> </ul>
Safety	<ul style="list-style-type: none"> <li>• Chair should have safety brake system while going down for patient exit position</li> </ul>
Motor	<ul style="list-style-type: none"> <li>• Should be Noiseless DC Motor</li> <li>• Should have Integrated power supply for fiber optic hand pieces, piezo electric motor etc.</li> <li>• Servo Voltage stabilizer of appropriate ratings meeting specifications. (Input 160-260 V and output 220-240 V and 50 Na fitted with Indian plug) should be quoted along</li> </ul>
Electrical and Plumbing	<ul style="list-style-type: none"> <li>• Necessary cables and all other accessories those are required for the smooth functioning of the system to be supplied</li> <li>• Should have minimum two high Speed Air Rotor terminals with water control on coupling with at least one fiber optic</li> <li>• All the outlet &amp; inlet for the services to the chair should be concealed in the box to be at the foot area of the chair or within the unit, as an infection control measure</li> <li>• High quality Autoclavable stainless steel quick disconnect water syringe.</li> </ul>
Necessary Attachments and Accessories	<ul style="list-style-type: none"> <li>• One in-built Plezon LED Ultrasonic scaler (frequency 28- 36 KHz)</li> <li>• Scaler tips - 2 set each (each set containing 4 tips)</li> <li>• Perio tips - 2 set each (each set containing 4 tips)</li> <li>• 2 endo tips set (each set containing 4 tips)</li> </ul> <p>It should be supplied with following scratch resistant handpieces</p> <ul style="list-style-type: none"> <li>• Micromotor straight and contra angle - (2 nos, each)</li> <li>• Air rotor handpiece -2 nos.</li> </ul> <p>All Handpieces should be covered under warranty and CMC.</p> <p>Burs/tips for the handpieces both in diamond and tungsten carbide should be provided (10 each) in various shapes and sizes.</p>
Light	<ul style="list-style-type: none"> <li>• Should have latest Sensor operated Non Touch (On/Off) LED Light</li> <li>• With luminosity of minimum 30000 to 50000 lux with maximum</li> </ul>

*Padmanabhi Acharya*  
 Dr. Padmanabhi Acharya  
 MDS (Oral and Maxillofacial Surgery)  
 Associate Professor  
 Dept. of Dentistry  
 Dr. RMLIMS, Lucknow

*P.K. Das*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

	<p>degrees of rotation of light arm movements</p> <ul style="list-style-type: none"> <li>• Light Head with axial movements - Horizontal, Vertical, Axial and diagonal adjustment</li> <li>• LED light 5000 K cool light or similar high quality light</li> </ul>
Storage and Maintenance	<ul style="list-style-type: none"> <li>• The unit should be capable of being stored continuously in ambient temperatures of 0 - 50 degree centigrade and relative humidity of 15 - 90 %.</li> <li>• The unit should be capable of operating continuously in ambient temperatures of 10 - 45 degree centigrade and relative humidity of 15 - 90 %.</li> <li>• Power Input to be 220 - 240V AC, 50 Rz</li> <li>• User/Technical/Maintenance manuals to be supplied In English</li> <li>• Certificate of calibration and Inspection.</li> <li>• List of important spare parts and accessories with their part number and costing</li> <li>• List of Equipment available for calibration and routine</li> <li>• Preventive Maintenance Support, As per manufacturer documentation In service/technical manual.</li> </ul>
Warranty and Certification	<p>Manufacturer should have ISO certification for quality standards</p> <p>The Dental chair and handpieces along with all other accessories should be European CE with 4 digit notified body no. /US FDA certified/BIS certified.</p> <p>Electrical safety conforms to standards for electrical safety IEC60601-1 (OR EQUIVALENT international/national standard) General requirement for Electrical safety of Medical Equipment.</p>
Installation and Upkeep	<ul style="list-style-type: none"> <li>• All consumables required for installation and standardization of system to be given free of cost</li> <li>• Log book with instructions for daily, weekly, monthly and quarterly</li> <li>• maintenance checklist. The job description of the hospital technician and company service engineer should be clearly spelt out</li> </ul>

*P. K. Das*  
 Dr. P. K. Das  
 MDS (Oral and Maxillofacial Surgery)  
 Associate Professor  
 Dept. of Dentistry  
 Dr. RMLIMS, Lucknow

*P. K. Das*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

	<ul style="list-style-type: none"> <li>• The supplier would do all the necessary civil, electrical, plumbing other changes required for the effective installation and functioning of the Dental Chair.</li> <li>• 2 lubrication sprays from OEM to be supplied free of cost every year during warranty and CMC period.</li> </ul>
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Scope of supply:

- Dental chair with 2 rotating Operator and Assistant stool, overhead system, light
- One in-built LED Ultrasonic scaler (frequency 28- 36 KHz)
- Instrument tray with overhanging attachment of handpieces
- Scaler tips - 2 set each (each set containing 4 tips)
- Perio tips - 2 set each (each set containing 4 tips)
- 2 endo tips set (each set containing 4 tips)
- Micromotor straight and contra angle - (2 nos, each)
- Air rotor handpiece -2 nos.
- Burs/tips for the handpieces both in diamond and tungsten carbide should be provided (10 each) in various shapes and sizes.
- 2 lubrication sprays from OEM

*Padma Anandhi Agarwal*  
 Dr. Padma Anandhi Agarwal  
 MDS (Oral and Maxillofacial Surgery)  
 Assoc. Prof. & Head  
 Dept. of Oral and Maxillofacial Surgery  
 Dr. RMLIMS, Lucknow

*P.K. Das*

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**IMPLANT KIT (WITH PHYSIO DISPENSER)**

S. No	Technical Specifications
Implant Kit	<ul style="list-style-type: none"> <li>• Advance Surgical kit.</li> <li>• Separate drills for Molars and Anterior Teeth</li> <li>• Both Machine and Hand Drivers available in kit.</li> <li>• Advance Torque wrench</li> <li>• Counter sink drills</li> <li>• Autoclavable Box</li> <li>• Path Pin and Parallel Pin Both.</li> <li>• Advance Guide Drills.</li> <li>• Advance Depth Gauge.</li> <li>• All Attachments, handpiece etc should be sterilizable through Steam and Flash Autoclave.</li> <li>• Rate of all the associated consumable items must be quoted for simultaneous rate contract of the same.</li> <li>• Instruments must be ISO/EN ISO/BS-EN-ISO certified and copy should be enclosed</li> <li>• Copy of the European CE or US FDA certificate must be attached.</li> </ul>
Physio-dispenser	<ul style="list-style-type: none"> <li>• Brushless Motor along with cord should be completely autoclavable and should be completely sealed with permanent lubricated gears.</li> <li>• Touch Panel with digital display for drill speed, direction, torque setting and water flow control.</li> <li>• Should provide following minimum programs:-</li> <li>• Program for bone drilling/ Implant placement.</li> <li>• Program for thread creation</li> <li>• Irrigation tubing systems easy to use (20 nos)</li> </ul>

*Padmanabha*  
 Dr. Padmanabha  
 MDS (Oral and Maxillofacial Surgery)  
 Associate Professor  
 Dept. of Dentistry  
 Dr. RMLIMS, Lucknow

*P.K.D.*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

	<ul style="list-style-type: none"> <li>• Adjustable Torque from 5-80Ncm.</li> <li>• Hand piece selection should be on the main unit. Speed reduction ratios should be 1:1, 16:1, 20:1, 24:1, 32:1, 70:1 80:1 and increasing speed is 1:5.</li> <li>• It should be supplied with Fibre Optic Motor &amp; 20:1 Fibre Optic handpiece.</li> <li>• Physio dispenser should have Torque calibration to give optimum torque.</li> <li>• Powerful pump with minimum flow rate of 70 ml/min.</li> <li>• Available minimum speed range on motor should be 200-40,000 rpm.</li> <li>• Foot control should have controls for Pump, Program and Direction.</li> <li>• Machine should be able to detect the errors automatically.</li> <li>• Should be CE European or US FDA approved.</li> </ul>
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Scope of Supply: Implant set with all attachments and torque wrenches basic and advanced,

20 implants with abutments, cover screws, 5 prosthetic sets,

Physiodispenser with touch panel, fibre optic motor and handpiece,

foot control, irrigation tubings 20 nos.

*Padmanabha*  
 Dr. Padmanabha  
 MDS (Oral and Maxillofacial Surgery)  
 Associate Professor  
 Dept. of Dentistry  
 Dr. RMLIMS, Lucknow

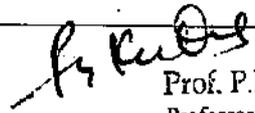
*P. K. Das*

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## INSTRUMENT OF DENTAL DEPARTMENT

S.No	<u>Instruments</u>	<u>Specifications</u>
1.	Mouth Mirror	Corrosion resistant Good visibility
2.	Probe	Single end Sharp point Made of high-grade Stainless Steel Corrosion Resistant - Passivated Ergonomic Design Better Grip Enhanced Working Efficiency Autoclavable at 135 degrees Celsius
3.	Tweezer	Good Inter Tip Contact Made of high-grade Stainless Steel Corrosion Resistant - Passivated Easy to use Ergonomic Design Less Fatigue Better Grip Enhanced Working Efficiency More Comfort Autoclavable at 135 degrees Celsius
4.	Spoon Excavator	Corrosion resistant Good ergonomic design

*Padmanabhan*  
 Dr. Padmanabhan Aggarwal  
 MDS (Oral and Maxillofacial Surgery)  
 Associate Professor  
 Dept. of Dentistry  
 Dr. RMLIMS, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

5.	Rubber Bowl	Good quality rubber, flexible
6.	Arkansas Stone	For sharpening instruments
7.	Composite Finishing And Polishing Kit	Good quality
8.	Ceramic Finishing And Polishing Kit	With all burs and discs
9.	Rubber Dam Kit	With all attachments and bands
10.	Straight Spatula	Corrosion resistant
11.	Curved Spatula	Corrosion resistant
12.	Rim Lock Impression Trays Dentulous Upper And Lower	Corrosion resistant Single piece metal without separately welded handles
13.	Rim Lock Impression Trays Edentulous Upper And Lower	Corrosion resistant Single piece metal without separately welded handles
14.	Conservative Filling Instruments	Corrosion resistant Double sided Serrated for better use Teflon coated
15.	3 Plane Articulator	Corrosion resistant
16.	Cotton Holder	Stainless steel
17.	Spirit Lamp	Corrosion resistant Stainless steel
18.	Gas Torch	With cylinders provided 2 Nos
19.	Wax Knife	Corrosion resistant

*Padmanabhi*

Dr. Padmanabhi Aggarwal  
MDS (Oral and Maxillofacial Surgery)  
Associate Professor  
Dept. of Dentistry  
Dr. RMLIMS, Lucknow

*P.K. Das*

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

20.	Wax Spatula	Corrosion resistant
21.	Dog Bite Articulator	Corrosion resistant
22.	Fox Plane	Plastic, non-deformable
23.	Pedodontic Forcep Sets	Made of high-grade Stainless Steel Easy to use Corrosion Resistant - Passivated Thin beaks All maxillary and mandibular teeth forceps
24.	Periosteal elevator	Made of high-grade Stainless Steel Easy to use Corrosion Resistant - Passivated Thin smooth edges
25.	Agate Spatula	Plastic, non-deformable Ergonomic Design
26.	Vita Shade Guide	Standard shades
27.	Handscaler Set	Made of high-grade Stainless Steel Easy to use Corrosion Resistant - Passivated
28.	Lucas Curettes	Made of high-grade Stainless Steel Easy to use Corrosion Resistant - Passivated
29.	Bone Files	Made of high-grade Stainless Steel Easy to use Corrosion Resistant - Passivated

Paediatric  
 Dr. Parmanidhi Agarwal  
 Associate Professor  
 Dept. of Dentistry  
 Dr. RMLIMS, Lucknow

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

30.	Autoclavable Bur Box	Corrosion Resistant For all size burs used for endodontics
31.	Autoclavable Endo Box	Corrosion Resistant
32.	Wire twister	Made of high-grade Stainless Steel Easy to use
33.	Extraction Forcep Kit Maxilla And Mandible	Made of high-grade Stainless Steel Easy to use
34.	3 <sup>rd</sup> Molar Forcep Maxilla And Mandible	Made of high-grade Stainless Steel Easy to use Thin anatomic ends Handles - Better Grip Sharp Rounded Beaks - Better Adaptation to the root surface Cut PDL easily Large handles - Better Operator fit Concave Inner Surface to fit the root Close Fitting Forcep Blades - spread the load evenly Corrosion Resistant - Passivated The beak is shaped to conform snugly to the contour of the tooth at upper and lower third molars
35.	Angled 3 <sup>rd</sup> Molar Mandibular Forcep	1) Made of high grade Stainless Steel 2) Ergonomic Design - # Serrated handles - Better Grip # Sharp Rounded Beaks - Better Adaptation to root surface Cut PDL easily

*Pd*  
Dr. Sachin Mishra Agarwal  
MDS (Oral and Maxillofacial Surgery)  
Associate Professor  
Dept. of Dentistry  
Dr. RMLIMS, Lucknow

*P.K.D.*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

		<p># Large handles - Better Operator fit</p> <p># Concave Inner Surface to fit the root</p> <p># Close Fitting Forcep Blades - spread the load evenly</p> <p>3) Rust Free</p> <p>Corrosion Resistant - Passivated</p> <p>4) Disinfection</p> <p>Autoclavable at 135 degree celsius</p> <p>5) offset design allows to reach obstacles and protect the corners of the patient's mouth</p> <p>6) In addition to the vertical angulation of handles with the blades, another bend is created in handles in order to prevent trauma to the angle of mouth. The angle is created so that its inner surface adapts the tip</p>
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Scope of supply:

All instruments as per number required in the respective setup

*Radwan*  
 Dr. P.K. Das  
 MDS (Oral & Maxillofacial Surgery)  
 Associate Professor  
 Dept. of Dentistry  
 Dr. RMLIMS, Lucknow

*P.K.D*

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**PRESSURE MOULDING MACHINE**

S. No	Technical Specifications
1.General	Pressure molding machine for all applications
	Pneumatic twin cylinder table lift and material clamping
	Quartz Heating with standby energy saving & power trim facility
	Auto sheet levelling
	Clearly Structured Display Timed events Heater, Pre-stretch, Vacuum, Cooling, Release
	Semi-automatic single sheet operation
	Should be able to accommodate sheet Material thickness of 0.25mm min. 6.0mm maximum ( both hard and soft sheets)
	Maximum Weight: 10 Kg
2.Special Features	Allowing Programming Of All Important Data Such As Heating Time, Temperature And Cooling Time.
	Full manual control through Touch Screen & PLC
3.Additional	To be provided with at least 100 sheets of each thickness (0.8 mm, 1 mm, 2 mm, 3 mm) both hard & soft.
4.Certification	Should be CE European or US - FDA approved.

Scope of supply-

Machine with 100 sheets ( of different thicknesses – hard and soft)

*Padmanabhan*  
 Dr. Padmanabhan Aggarwal  
 MDS (Oral and Maxillofacial Surgery)  
 Associate Professor  
 Dept. of Dentistry  
 Dr. RMLIMS, Lucknow

*P.K.D.*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

S. No	Technical Specifications
1. General Specifications	<ul style="list-style-type: none"> <li>• Purpose: Digital intraoral radiography for dental imaging.</li> <li>• Technology: CMOS or CCD sensor with fiber-optic plate (FOP) for enhanced image quality.</li> <li>• 2 Sensor Sizes: Pediatric and Adult</li> </ul>
2. Image Quality & Performance	<p>Resolution:</p> <ul style="list-style-type: none"> <li>• Theoretical: Up to 25 lp/mm.</li> <li>• Effective: 16-20 lp/mm (clinical).</li> <li>• Pixel Size: 15-20 <math>\mu</math>m.</li> <li>• Gray Scale: 14-16 bit for high contrast.</li> <li>• Dynamic Range: Wide exposure latitude to prevent over/underexposure.</li> <li>• Noise Reduction: Advanced algorithms for clearer imaging.</li> </ul>
3. Connectivity & Software	<p>Connection Type: USB (Wired): Direct plug-and-play.</p> <p>Software Compatibility: Works with most dental imaging software (DICOM compatible)</p> <p>Operating System Support: Windows, macOS (some models).</p>
4. Durability & Design	<ul style="list-style-type: none"> <li>• Cable Strength: Reinforced flexible cable for durability</li> <li>• Waterproof Rating: IP67 or higher (for easy disinfection).</li> <li>• Shock Resistance: Shock-absorbing casing for impact protection.</li> </ul>
5. Power & Environmental Conditions	<ul style="list-style-type: none"> <li>• Power Source: USB-powered (about 5V, low consumption).</li> <li>• Operating Temperature: 10°C to 40°C.</li> <li>• Storage Temperature: -20°C to 60°C.</li> </ul>

Scope of supply:

Sensors adult and pediatric,  
 Software with uploading on multiple systems possible,  
 sleeves for sensor, 200 nos, for single use intraorally

*Padmanabhi Agarwal*  
 Dr. Padmanabhi Agarwal  
 MDS (Oral and Maxillofacial Surgery)  
 Associate Professor  
 Dept. of Dentistry  
 Dr. RMLIMS, Lucknow

*P.K. Das*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## SOFT TISSUE DIODE DENTAL LASER

S. No	Technical Specifications
Modes	<ul style="list-style-type: none"> <li>The laser should have both Blue and Red Laser Mode.</li> <li>Should have modes for non-contact laser procedures.</li> </ul>
Wave length	Should have different wavelengths of 450nm, 976nm & 650 nm for different procedures.
Screen	<ul style="list-style-type: none"> <li>Should have Touch Screen with display of all the procedures</li> <li>Preset parameters.</li> </ul>
Tips	<ul style="list-style-type: none"> <li>Should come with 20 Fibre optical tips which can be removed after usage.</li> <li>Accessories - Whitening tip, TMJ Therapy Tip, Biostimulation tip</li> </ul>
Glasses	Laser protective glasses -3 in number should be provided for patient, operator and assistant use.
Battery	Should come with about 5200 mAh lithium battery with power-backup.
Certi- fication	<ul style="list-style-type: none"> <li>Instruments must be ISO/EN ISO/BS-EN-ISO certified and copy should be enclosed</li> <li>Copy of the European CE or US FDA certificate must be attached</li> </ul>

Scope of supply: LASER unit with touchscreen display with 20 (few each of different sets of) LASER tips and Laser protective glasses -3.

*Padmal*  
 Dr. Padmanabhi Agertwal  
 MDS (Oral and Maxillofacial Surgery)  
 Associate Professor  
 Dept. of Dentistry  
 Dr. RMLIMS, Lucknow

*P.K.D.*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**U. V. ASEPTICIZER**

S. No	Technical Specifications
1. General Specifications	<p><b>Purpose:</b> Designed for sterilizing dental instruments using UV-C light.</p> <p><b>Chamber Type:</b> Enclosed with reflective interior for maximum UV exposure.</p> <p><b>Capacity:</b> Available in small (5L), medium (10L), and large (20L) variants.</p>
2. UV Sterilization System	<ul style="list-style-type: none"> <li>• UV Light Source: 253.7 nm wavelength (UV-C).</li> <li>• Number of UV Lamps: 2-4 quartz UV-C lamps, depending on chamber size.</li> <li>• Lamp Life: ~10,000 hours.</li> <li>• Sterilization Cycle: 5-15 minutes (adjustable).</li> <li>• UV Intensity: <math>\geq 2</math> mW/cm<sup>2</sup> for effective disinfection.</li> </ul>
3. Safety Features	<ul style="list-style-type: none"> <li>• Automatic Shutoff: UV lights turn off when the door is opened.</li> <li>• Tempered Glass Window: UV-blocking for safe monitoring.</li> <li>• Leakage Prevention: Sealed chamber to prevent UV exposure.</li> <li>• Overheat Protection: Automatic cooling mechanism for prolonged operation.</li> </ul>
4. Construction & Design	<ul style="list-style-type: none"> <li>• Stainless steel (304/316-grade) interior for durability.</li> <li>• Shelving: Removable stainless-steel trays for multiple instruments.</li> </ul>
5. Power & Connectivity	<ul style="list-style-type: none"> <li>• Power Supply: 110-240V, 50/60Hz (universal compatibility).</li> <li>• Power Consumption: 20W - 60W, depending on size</li> </ul>

Scope of Supply: UV Chamber with appropriate s.s trays (with an extra set for rotation of instruments), power connections.

Dr. Pooja Agarwal  
MDS (Oral and Maxillofacial Surgery)  
Associate Professor  
Dept. of Dentistry  
Dr. RMLIMS, Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**ULTRASONIC SCALER (Dental Scaler)**

S. No	Technical Specifications
1. Frequency Range	Standard Frequency in the 25-40 kHz frequency range.
2. Power Output	<ul style="list-style-type: none"> <li>Adjustable power setting ranging from low to high.</li> <li>Typical power ranges are 5 to 25 watts, with the ability to fine-tune based on the level of calculus.</li> </ul>
3. Modes and Settings	<ul style="list-style-type: none"> <li>Adjustable Power: digital control to adjust the power according to the patient's needs and the type of scaling required.</li> <li>Provision of Pulsed Mode, reducing heat generation and improving patient comfort.</li> <li>Continuous Mode</li> </ul>
4. Tip Movement	<ul style="list-style-type: none"> <li>Elliptical (Orbital) Motion</li> <li>Tip Vibration: The scaler's handpiece contains a vibrating tip.</li> <li>Different tips are designed for various functions (e.g., periodontal cleaning, scaling, root planing, and stain removal).</li> </ul>
5. Water Flow and Irrigation	<ul style="list-style-type: none"> <li>Water Cooling</li> <li>Adjustable water flow</li> <li>Internal water irrigation systems</li> </ul>
6. Ergonomics and Handpiece Design	<ul style="list-style-type: none"> <li>The handpiece should be lightweight, comfortable to hold, and well-balanced to reduce hand and wrist fatigue.</li> <li>rubberized grips or soft-touch features to enhance comfort.</li> <li>cordless or coded design</li> </ul>
7. Tip Compatibility	<ul style="list-style-type: none"> <li>Universal Compatibility: compatible with a variety of tips for different purposes (e.g., scaling, root planing, or implant maintenance).</li> <li>Types of Tips to be provided: scaling tips, periodontal tips, fine tips, and specialty tips designed for implant care.</li> <li>Autoclavable Tips: Ensure the tips are made from durable, autoclavable materials for hygiene and ease of sterilization.</li> </ul>
8. Noise and Vibration	<ul style="list-style-type: none"> <li>low noise and minimal vibration to enhance patient comfort.</li> <li>Low vibration</li> </ul>
9. Heat Control and Cooling	<ul style="list-style-type: none"> <li>Heat Management</li> <li>Cool Water Flow</li> </ul>
10. Foot Control	<ul style="list-style-type: none"> <li>Foot Pedal for controlling the power and water flow.</li> </ul>
11. Durability and	<ul style="list-style-type: none"> <li>The ultrasonic scaler should be made from high-quality, durable materials. Handpieces should be resistant to corrosion.</li> </ul>

*Padma*  
**Padmanidhi Agarwal**  
 MDS (Oral and Maxillofacial Surgery)  
 Associate Professor  
 Dept. of Dentistry  
 Dr. RMLIMS, Lucknow

*P.K.D.*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

Build Quality	<p>especially in a dental environment with frequent sterilization.</p> <ul style="list-style-type: none"> <li>Stainless Steel: Handpieces and tips are often made from stainless steel or medical-grade plastic for long-lasting performance.</li> </ul>
12. Size and Weight.	Compact Design: lightweight and ergonomic design
13. Patient Comfort	Adjustable power settings and fine control over water flow
14. Maintenance and Sterilization	<ul style="list-style-type: none"> <li>Handpieces and tips must be easy to clean and sterilize, typically through autoclaving.</li> </ul>
15. Warranty and Support	<ul style="list-style-type: none"> <li><del>2 years</del> <i>P</i></li> <li>USA FDA or CE certified</li> </ul>

Scope of Supply: Ultrasonic scaler with LED panel , Foot control, Handpiece, adjustable water flow switch, inlet outlet connections, scaler tips all types 3 in number each.

*Padhy*  
**Dr. Padmanidhi Agarwal**  
 MDS (Oral and Maxillofacial Surgery)  
 Associate Professor  
 Dept. of Dentistry  
 Dr. RMLIMS, Lucknow

*P.K. Das*

**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## ULTRASONIC CLEANING SYSTEM

S. No	Technical Specifications
1. Frequency Range	25 kHz to 40 kHz frequency range.
2. Tank Size and Capacity	large enough to accommodate all dental instruments 1-6 liters in capacity.
3. Power Output	power generally ranges from 50W to 200W
4. Timer Settings	<ul style="list-style-type: none"> <li>adjustable timers for customizing cleaning duration.</li> <li>Typical cleaning times from 3-10 minutes, with the timer allowing you to select the appropriate duration based on the level of contamination.</li> <li>Automatic shut-off after the selected cleaning cycle ends.</li> </ul>
5. Heating Function	<ul style="list-style-type: none"> <li>Heated Ultrasonic Cleaners for enhanced cleaning</li> <li>The heating function typically operates at 50-70°C (122-158°F),</li> </ul>
6. Material and Construction	<ul style="list-style-type: none"> <li>The cleaner's tank should be made from stainless steel, as this is durable, resistant to corrosion, and easy to clean.</li> <li>Built-in drain valves make it easier to empty and clean the tank between uses.</li> </ul>
7. Cleaning Solution	<ul style="list-style-type: none"> <li>Ultrasonic cleaners work with special cleaning solutions (typically water-based) designed to remove debris effectively.</li> <li>It's important to choose the appropriate solution for different instruments or materials to avoid damage.</li> <li>The cleaner should be compatible with various dental disinfectants and cleaning solutions.</li> </ul>
8. Display and Controls	<ul style="list-style-type: none"> <li>digital displays for easy monitoring of time, temperature, and other settings.</li> <li>touchscreen controls</li> </ul>
9. Safety Features	<ul style="list-style-type: none"> <li>overheat protection and automatic shut-off features.</li> <li>overload protection to prevent damage to the unit</li> </ul>
10. Noise Level	as quiet as possible.(around 50-60 dB
11. Size and Portability	<ul style="list-style-type: none"> <li>compact models that are easy to store.</li> <li>lightweight units if the cleaner needs to be moved around between operatories.</li> </ul>

*Padma* Dr. Padmanidhi Aggarwal  
 Associate Professor  
 Dept. of Dentistry  
 Dr. RMLIMS, Lucknow.

*P.K.D.*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

12. Maintenance	Easy to maintain, with removable trays or baskets to hold instruments.  Easy to clean
13. Certifications and Compliance	<ul style="list-style-type: none"> <li>• Make sure the ultrasonic cleaner complies with FDA standards for dental equipment (if in the U.S.).</li> <li>• It should also comply with relevant ISO or CE standards for medical devices.</li> </ul>

**Scope of supply-** Ultrasonic cleaning system with separate set of trays/ baskets for instruments, attachment cords

*Pankaj*  
Dr. Pankaj Agarwal  
MDS (Oral & Maxillofacial Surgery)  
Associate Professor  
Dept. of Dentistry  
Dr. RMLIMS, Lucknow

*P. K. Das*

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## VISTA SCAN

S. No	Technical Specifications
1. Imaging Technology	<ul style="list-style-type: none"> <li>Photostimulable Phosphor plates instead of traditional film or sensors to capture X-ray images. These plates are reusable and offer high-quality images.</li> </ul>
2. Resolution	<ul style="list-style-type: none"> <li>high-resolution images with up to 20–25 line pairs per millimeter (lp/mm).</li> </ul>
3. Image Size and Plate Options	<p>With pediatric and adult (anterior and posterior teeth) sizes. These size options provide flexibility depending on the patient's needs.</p> <p>1 set each needed</p>
4. Scan Time	<ul style="list-style-type: none"> <li>7–10 seconds to scan a plate.</li> </ul>
5. System Compatibility	<ul style="list-style-type: none"> <li>compatible with various dental imaging software and digital dental units, allowing easy integration into existing digital workflow systems.</li> <li>compatible with most common DICOM standards.</li> </ul>
6. User Interface and Ease of Use	<ul style="list-style-type: none"> <li>an intuitive user interface that helps dental professionals easily view, manage, and enhance images.</li> <li>It supports features like automatic exposure detection, image enhancement, and storage for easy retrieval.</li> </ul>
7. Image Storage and Archiving	<ul style="list-style-type: none"> <li>Images can be stored directly in the cloud or locally, with options for automatic archiving to reduce the risk of data loss.</li> <li>The system supports network integration, allowing images to be shared across multiple operatories or computers.</li> </ul>
8. Plate Erasure and Reusability	<p>After the image is scanned, the PSP plate is automatically erased by the system's scanner to prepare it for reuse.</p> <p>Each PSP plate can be reused hundreds of times without degradation in image quality.</p>
9. Size and Footprint of	<ul style="list-style-type: none"> <li>compact</li> </ul>

*Padma*  
 Dr. Padma Anil Agarwal  
 MDS (Oral and Maxillofacial Surgery)  
 Associate Professor  
 Dept. of Dentistry  
 Dr. RMLIMS, Lucknow

*P.K.D.*

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

the Scanner	<ul style="list-style-type: none"> <li>• small footprint compared to traditional film processors</li> </ul>
10. Radiation Dose	<ul style="list-style-type: none"> <li>• As a digital system, it should require lower radiation doses to produce clear and sharp images.</li> </ul>
11. Durability and Maintenance	<ul style="list-style-type: none"> <li>• high durability and minimal maintenance.</li> <li>• The PSP plates are designed to be resistant to wear, although they need careful handling to avoid damage.</li> </ul>
13. Connectivity	<p>wireless or wired connections to the dental office network.</p> <p>It integrates with various imaging software platforms for easy image retrieval and sharing across workstations</p>
14. Software Compatibility	<ul style="list-style-type: none"> <li>• Should work with different software, such as Sidexis, as well as third-party imaging software that supports DICOM standards.</li> </ul>
15. Portability	<p>portability for easy use in various treatment rooms without needing a dedicated space.</p>

Scope of Supply: 3-4 sizes of PSP plates, Provision for LAN connection, portable VISTA system with attachment leads and cords.

*Padma*  
**Dr. Padma Anjali Agarwal**  
 MDS (Oral and Maxillofacial Surgery)  
 Associate Professor  
 Dept. of Dentistry  
 Dr. RMLIMS, Lucknow

*P. K. Das*

**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

# **Dermatology**



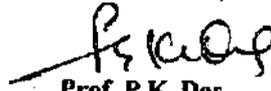
**Declaration Certificate about Technical Specifications  
related to Department of Dermatology by committee  
members**

SR. NO.	NAME OF EQUIPMENT	GO NUMBER	APPROX. COST
1.	CO2 Laser	GO-28-Jan-18 Suchi-2 GO-7-Dec-2022	55,00,000/-
2.	ND YAG Laser	GO-28-Jan-18 Suchi-2 GO-7-Dec-2022	55,00,000/-

This is to certify that technical specification of all the above-mentioned machine/instruments, approved by the technical committee is not of any specific company. The technical features of the equipment/instruments from all reputed firms in the current market have been included in this specification to the best of my knowledge and belief & in the opinion of the technical committee.

The technical specification duly signed by the technical committee members is attached herewith.

  
**Dr. Soumya Agarwal**  
Assistant Professor  
DR RMLIMS, Lucknow.  
Dr. Soumya Agarwal  
Associate Professor  
Dept. of Dermatology  
Dr. RMLIMS, Lucknow

  
**Prof. P.K. Das**  
Chairman  
Technical specifications committee  
Clinical Subjects & others  
Head, Department of Anesthesiology & CCM  
DR RMLIMS, Lucknow

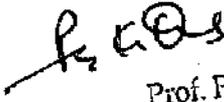
**CO2 Laser**

LASER TYPE: SEALED CO2 LASER TUBE  
 LASER POWER: 11-150W  
 CUTTING AREA: 1300\*2500MM  
 RESETTING POSITION ACCURACY: +/- 0.005MM  
 WORKING VOLTAGE: AC110-220V  
 POWER: 1500W  
 OPERATING TEMPERATURE: 0-45DEGREE  
 MINIMUM SHAPING CHARACTER: ENGLISH 1\*1MM  
 GRAPHIC FORMAT SUPPORTED: BMP, PLT, DST, DXF, AND AI  
 DRIVING SYSTEM: LEADSHINE STEPPER DRIVING  
 COOLING MODE: WATER COOLING AND PROTECTION SYSTEM  
 AUXILLARY EQUIPMENT: EXHAUST FAN, AIR EXHAUST PIPE, AIR COMPRESSOR  
 CONTROLLING SYSTEM: RDCAM6442S  
 COMPATIBLE SOFTWARE: COLEDRAW AUTO CAD PHOTOSHOP  
 WHOLE MACHINE SIZE: 3400\*1930\*1450MM  
 MACHINE WEIGHT: 650KG

**Certification:**

- US FDA / EU CE

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology  
 Dr. RMLIMS, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**ND YAG Laser**

Wavelength: 1064nm

Pulse width: 5ns

Pulse energy: 500mj

Pulse energy range: 100-500mj

Frequency: 5Hz

Spot size: 2-10mm adjustable

Fluence: 0.6-16j/cm<sup>2</sup>

Aiming beam: 635nm, <5mw

Electrical requirements: 110-240VAC 50-60Hz 1200VA

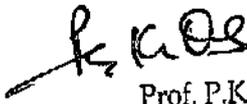
Dimension: 351mm\*925mm\*775mm(without optical articulated arm)

Net weight: 80 kg

**Certification:**

- US FDA / EU CE

  
Dr. Saumya Agarwal  
Associate Professor  
Dept. of Dermatology  
Dr. RMLIMS, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**ENT**



**Declaration Certificate about Technical Specifications  
related to Department of ENT by committee  
members**

SR. NO.	NAME OF EQUIPMENT	GO NUMBER	APPROX. COST
1.	Adeno- tonsillectomy Instruments	GO-28-Jan-18 Suchi-2 GO-06-Mar-18 Suchi-3 GO-23-Aug-18 Suchi-4	2,50,000
2.	Pure Tone Audiometer Equipment	GO-23-Aug-18 Suchi-4 GO-28-Jan-18 Suchi-2	6,00,000
3.	ENT Endoscopy System	GO-28-Jan-18 Suchi-2 GO-06-Mar-18 Suchi-3 GO-23-Aug-18 Suchi-4 GO-23-Aug-18 Suchi-4	50,00,000
4.	ENT OPD UNIT	GO-7-Dec-2022 GO-7-Dec-2022 GO-23-Aug-18 Suchi-4 GO-23-Aug-18 Suchi-4 GO-28-Jan-18 Suchi-2	25,00,000
5.	ENT Operating Microscope	GO-28-Jan-18 Suchi-2 GO-7-Dec-2022	50,00,000
6.	Rigid Esophagoscope Set	GO-28-Jan-18 Suchi-2 GO-06-Mar-18 Suchi-3	4,00,000
7.	Head & Neck Surgery Instruments	GO-06-Mar-18 Suchi-3 GO-06-Mar-18 Suchi-3 GO-06-Mar-18 Suchi-3	5,00,000
8.	Microdebrider System	GO-23-Aug-18 Suchi-4 GO-7-Dec-2022	8,00,000
9.	Micromotor Drill	GO-28-Jan-18 Suchi-2 GO-23-Aug-18 Suchi-4 GO-7-Dec-2022	10,00,000
10.	Miscellaneous Assorted ENT Instruments	GO-28-Dec-17 Suchi-1 GO-06-Mar-18 Suchi-3 GO-06-Mar-18 Suchi-3 GO-06-Mar-18 Suchi-3 GO-06-Mar-18 Suchi-3 GO-06-Mar-18 Suchi-3 GO-06-Mar-18 Suchi-3 GO-23-Aug-18 Suchi-4 GO-23-Aug-18 Suchi-4 GO-23-Aug-18 Suchi-4 GO-23-Aug-18 Suchi-4 GO-23-Aug-18 Suchi-4 GO-23-Aug-18 Suchi-4 GO-23-Aug-18 Suchi-4 GO-23-Aug-18 Suchi-4 GO-23-Aug-18 Suchi-4 GO-23-Aug-18 Suchi-4	2,00,000
11.	OAE Equipment	GO-23-Aug-18 Suchi-4	5,00,000
12.	Rigid Bronchoscopy Set with Optical Forceps	GO-23-Aug-18 Suchi-4 GO-28-Jan-18 Suchi-2	35,00,000
13.	Septoplasty & FESS Instruments	GO-23-Aug-18 Suchi-4 GO-06-Mar-18 Suchi-3 GO-23-Aug-18 Suchi-4	3,00,000

  
Dr. Ashish Chandra Agarwal  
MS (ENT), MRCS Ed.  
Additional Professor  
Dept. of ENT  
Dr. R.M.L.I.M.S., Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow



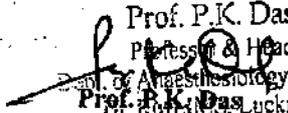
**Declaration Certificate about Technical Specifications  
related to Department of ENT by committee  
members**

14.	Instruments for Microlaryngeal Surgery	GO-23-Aug-18 Suchi-4 GO-23-Aug-18 Suchi-4 GO-06-Mar-18 Suchi-3	3,50,000
15.	BERA Equipment	GO-28-Jan-18 Suchi-2	12,00,000
16.	Diagnostic Immittance Meter	GO-23-Aug-18 Suchi-4 GO-28-Jan-18 Suchi-2	6,00,000
17.	Image Guided Head and Neck Surgery System	GO-28-Jan-18 Suchi-2	2,00,00,000
18.	Septo-rhinoplasty Set	GO-28-Jan-18 Suchi-2	4,00,000
19.	Temporal Bone Dissection Laboratory	GO-7-Dec-2022 GO-23-Aug-18 Suchi-4	3,00,000
20.	Nerve Monitoring System	GO-28-Jan-18 Suchi-2	60,00,000
21.	Tympanoplasty and Mastoidectomy Instruments	GO-23-Aug-18 Suchi-4 GO-23-Aug-18 Suchi-4 GO-06-Mar-18 Suchi-3 GO-06-Mar-18 Suchi-3 GO-06-Mar-18 Suchi-3 GO-28-Jan-18 Suchi-2	2,50,000

This is to certify that technical specification of all the above-mentioned machine/instruments, approved by the technical committee is not of any specific company. The technical features of the equipment/instruments from all reputed firms in the current market have been included in this specification to the best of my knowledge and belief & in the opinion of the technical committee.

The technical specification duly signed by the technical committee members is attached herewith.

  
**Dr. Ashish Chandra Agarwal**  
Professor (JG)  
Dr. Ashish Chandra Agarwal  
MS ENT, MCh ENT  
DR. RMLIMS, Lucknow  
Additional Professor  
Dept. of ENT  
Dr. R.M.L.I.M.S., Lucknow

  
**Prof. P.K. Das**  
Professor & Head  
Dept. of Anesthesiology & CCM  
Dr. RMLIMS, Lucknow  
Chairman  
Technical specifications committee  
Clinical Subjects & others  
Head, Department of Anesthesiology & CCM  
DR RMLIMS, Lucknow

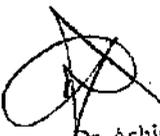
Adeno-tonsillectomy instruments		
S.N.	Item description	Qty. required
1.	Adenoid curette with detachable cage, size - 1,2,3, 4	1 each
2.	Blakesley 60 degree upturned, long jaw with round tip for grasping polyps and adenoid tissue, length 10-15 cm	1
3.	A set of Boyle Davis mouth gag of different sizes	1 set
4.	Tongue blade slotted/central groove for use with Boyle Davis mouth gag, different sizes	1 set
5.	Tongue blade for use with Boyle Davis mouth gag, different sizes	1 set
6.	Draffin bipod stand for use with tongue blade	1 pair
7.	Base plate to hold the draffin bipod stand	1
8.	Doyens mouth gag for adults	1
9.	Doyens mouth gag for children	1
10.	Dennis brown tonsil holding forceps, length 15-20 cm	1
11.	Eve's tonsillar snare, length 25-30 cm	1
12.	Pack of wire snare loop of stainless steel	1 pack
13.	Yankauer pharyngeal suction with small holes length 25-30 cm	1
14.	Tinaculum (Long toothed forceps, length 25 cms or more)	1
15.	Long non toothed forceps, length 25 cms or more	1
16.	Tonsillar dissector with pillar retractor, width 5-10 mm, length 20-25 cm	1
17.	Tonsillar suction dissector, width 10-15 mm, length 20-25 cm	1
18.	Ligature slipper, length 15-20 cm	1
19.	Needle holder, long, fine tip, length 20-22 cm	1
20.	Suture cutting scissors	2
21.	Delicate needle holder with spring action, length 17-20 cm	2
22.	Crile wood needle holder, length 14-17 cm	2

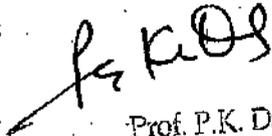
Dr. Ashish Chandra Agarwal  
 (ENT), MRCS Ed.  
 Additional Professor  
 Dept. of ENT  
 Dr. R.M.L.I.M.S., Lucknow

*[Signature]*  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

23.	Negus long right angled (90 degree) forceps 20-22 cm	2
24.	Negus long 45 degree angled forceps 20-22 cm	2
25.	Tongue holding forceps, length 15-20 cm	2
26.	Bard parker knife handle: long	2
27.	Container for storage and sterilization of instruments	2

1.  $\pm 10\%$  variation in size range is acceptable
2. TC inlay should be welded and not pasted.
3. Instruments should be made from high quality surgical grade steel.
4. Instruments should have Laser surface or ebonized or equivalent finish to provide appropriate reflection lowering property.
5. The instruments should be light weight, strong, with high precision and durable.
6. The instruments should be non-magnetic.
7. Catalogue number and article number should be mentioned on each instrument.
8. There should be country of origin/ manufacturing engraved on each instrument.
9. The instruments should be CE certified.
10. The instruments should be autoclavable.
11. All instruments should be of the same make.

  
 Dr. Ashish Chandra Agarwal  
 MS (ENT), MRCSEd.  
 Additional Professor  
 Dept. of ENT  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

### Pure Tone Audiometer

- A.1. **Channel:** Two separate with independent attenuators.
- A.2. **Stimulus type:** Tone, warble, pulsed tone, pulsed warble, (Frequency specific Hearing assessment noise)
- A.3. **Special tests:** SISI, ABLB, Tone Decay, Free field (Complete setup, including speakers), Speech test, Word Recognition.
- A.4. **Frequency range:**
  - A4.1. TDH 39 earphone- 250 to 8000 Hz or more
  - A4.2. Insert ear phones- 250 to 8000 Hz or more
  - A4.3. Bone conduction (BC)- 250 to 4000Hz
- A.5. **Level Range:**
  - A5.1. Air conduction (AC): -10dBHL to 120dBHL
  - A5.2. Bone Conduction: -10dBHL to +80 dBHL
  - A5.3. Speech: -10dBHL to 100dBHL
  - A5.4. Masking: -10dBHL to 100dBHL
- A.6. **Masking types:** Narrow band noise, Speech Noise, White noise.
- A.7. **Stimulus modulation:**
  - A7.1. Warble Tone: 1 to 10Hz + 5% Modulation
  - A7.2. SISI: 5, 2, 1 dB decrements.
- A.8. Should have full speed USB port connector (3.0 or more).
- A.9. Should be supplied with required software with updates in CD/DVD.
- A.10. Data storage facilities unlimited with computer software
- A.11. **External Input:** CD player, Tap recorder or Microphone
- A.12. Equipment should be provided with required electricity safety equipment (UPS) and compatible with 220 V-50 Hz. AC Supply.
- A.13. The setup should have two-way talk-back facility.
- A.14. The system should be provided with a compatible laser colour printer.
- A.15. Equipment should conform to US FDA/European CE standards.

PC/Laptops systems, wherever mentioned should include genuine/licensed operating system, licensed MS Office Home & Business (Latest Version), licensed Adobe Acrobat Full Version, licensed standard anti-virus software with all backup (DVD etc.) media of all the software and all the accessories to run the required software seamlessly.

  
 Dr. Ashish Chandra Agarwal  
 MS (ENT), MRCS Ed.  
 Additional Professor  
 Dept. of ENT  
 Dr. R.M.L.I.M.S., Lucknow.

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## ENT Endoscopy System

### 1. High Definition Camera System

- The Full HD camera (CCD or CMOS) should have a resolution of 1920 x 1080 pixels or more (lower resolution will not be acceptable), with progressive scanning on camera head and console.
- Compatible with an aspect ratio of 16:9
- Should have focus function which can be varied steplessly from coarse to fine image.
- Should have digital and optical zoom which can be varied seamlessly.
- The camera head should have programmable function keys.

### 2. High Definition Monitor

- Medical Grade Flat Screen HD LED Monitor for use with HD System, having a resolution of 1920 x 1080 pixels.
- Compatible with an aspect ratio of 16:9
- Minimum 26 inches (lower size will not be acceptable).

### 3. Full High Definition Video and Image Recording System

- A full HD recording system (video and still images) for capturing real time Endoscopy.
- Should have internal/ external hard disk drive of 1000GB or more and should have facility of recording on Blue Ray Disc/DVD Disc/USB memory stick if required by user.
- Should be able to edit the archived videos like cutting, cropping and other modifications as required.
- The recording should be with a maximum resolution of 1920x1080 pixels.

### 4. LED Light Source with Light Cable

- A Powerful LED Lamp (intensity equivalent to 300 watts or more Halogen) with atleast 30,000 hrs lamp life.
- Automatically adjusts light intensity to achieve ideal illumination
- An Autoclavable type fiber optic light guide cable to be provided for better protection against mechanical and thermal stress.
- The cable should have a small bending radius, and the length should be 3 meters or more.

### 5. Mobile Video cart

- Must have minimum 4 shelves and a drawer.
- Castor Wheel with brakes
- The dimensions should be such that all equipments and accessories of the endoscopy system can be placed safely on the cart.
- Load Capacity – Top Tray approx. 20 Kg, Intermediate shelves approx. 30 Kg, Base Panel approx. 30 Kg

  
 Dr. Ashish Chandra Agarwal  
 MS (ENT), MRCS Ed.  
 Additional Professor  
 Dept. of ENT  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

- LED Monitor Tray
- Drawer Pack to facilitate safe storage of a variety of devices
- Cable management should be possible
- Electrical Safety (transformer fitted as standard)
- Must be of the same make as the endoscopy unit.

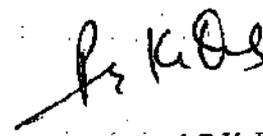
3. **Rigid telescopes and handles**

- Wide Angle, Straight Forward Telescope 0°, enlarged view, diameter 4 mm and length 140- 180 mm, autoclavable: 2 nos.
- Wide Angle, Straight Forward Telescope 30°, enlarged view, diameter 4 mm and length 140- 180 mm, autoclavable: 1 nos.
- Wide Angle, Straight Forward Telescope 70°, enlarged view, diameter 4 mm and length 140- 180 mm, autoclavable: 1 nos.
- Wide Angle, Straight Forward Telescope 0°, enlarged view, diameter 2.7 mm and length 140- 180 mm, autoclavable: 1 nos.
- Wide Angle, Straight Forward Telescope 30°, enlarged view, diameter 2.7 mm and length 140- 180 mm, autoclavable: 1 nos.
- Telescope Handle, flat, for use with telescopes of diameter 2.7 mm and length 140- 180 mm: 1 nos.
- Telescope Handle, flat, for use with telescopes of diameter 4 mm and length 140- 180 mm: 1 nos.

1. The accessories required for the proper functioning of these equipments should be provided, of same make.
2. Same make consumables required for proper functioning of the equipments should be provided.
3. The equipment should have brand name / model number embossed / etched on the equipment.
4. All the equipment and the accessories must be from the same manufacturer and be USFDA/ European CE approved.
5. The company should have service facility in Uttar Pradesh



Dr. Ashish Chandra Agarwal  
MS (ENT), MRCS Ed.  
Additional Professor  
Dept. of ENT  
Dr. R.M.L.I.M.S., Lucknow



Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## TECHNICAL SPECIFICATION OF ENT OPD UNIT

### 1- Main Unit: Should consist of the following

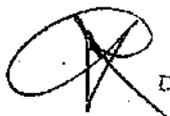
- Durable steel casing, non-rusting, long lasting on wheels
- Large instrument surface in 2 or more levels made of stainless steel with dividers and heating system to heat the instruments.
- Additional Integrated desk extension ( Minimum 120 cm) with In-Built sliding Keyboard shelf with stand
- Minimum 4 Drawers for storage self closing and long lasting with UV sterilization in one of the drawers.
- In-Built mirror warmer and In-Built waste container,
- Integrated Dust protection cover for the unit
- Head Light with fibre-optic cable and Integrated Head lamp holder with automatic on/off
- Integrated compressed air for atomisers (both liquid and powder) with regulation valve.
- Medication reservoir be made of stainless steel, should be detachable and suitable for all type of medication.
- Integrated suction system with regulation valve and suction tube cleaning system.
- Suction tube should have automatic on/ off switch and small ear rinse funnel
- Suction tube cleaner with exchangeable re-usable adapter.
- Integrated ear syringing system for warm water of 37° C
- In-Built Dispenser for cotton and tongue holding paper in one of the drawers
- Integrated LED Light source (intensity equivalent to 300 W or more Halogen) - 2 nos with separate outlet.
- Fiber-optic cable (90 Deg angled) should be supplied for use with endoscopes.
- Storage for endoscopes/ quiver for both 5mm (3 in nos.) and 12 mm (1 nos.) with heating system (Removable and autoclavable)
- Integrated Upper shelf for keeping additional devices.
- Storage for used endoscopes with disinfectant (Removable and autoclavable)- 3 nos
- Power supply 220-240 volts/50 Hz.
- X-ray viewer should be provided
- Stainless steel tongue depressor holder, (4 rows)- Qty-1
- A seprate cordless Head light,LED, light weight,rechargeable battery box on head band, illumination area: 10-100 mm in diameter, 40-45 cms working distance: 1 nos.

### 2- ENT EXAMINATION MICROSCOPE

- Microscope (as specified) should be with floor stand on wheels.
- With 3 step magnification changer.
- Object F = 250 mm with fine focusing, magnification 15 times or more
- Binocular vision
- Inbuilt LED light source.
- Beam splitter with endoscope camera head adapter
- Eyepiece for spectacle wearers
- Power supply: 220-240 volts/50Hz

### 3- ENT PATIENT EXAMINATION CHAIR

- Should be motorized and ergonomically designed examination and treatment chair facilitating the posture of both doctor and patient
- Synchronous adjustment of back rest and leg rest
- Heavy base casing
- Seat should have motorized lifting device using footswitch



- Should have complete rotation 360-degree with locking device
- Backrest adjustable and can be made to incline 10 degree forward to vertical position and backward completely to a horizontal position and can be rolled back
- Ergonomic upholstery parts with colour options
- Power supply: 220-240 volts/50Hz

#### 4- Doctors Examination Chair

- Wide base with castors and brakes for easy movement.
- Should have rotatable back rest.
- Easy hand controlled height adjustment of hydraulic nature.
- Chrome plated metal cross base with foot ring for durability

#### 5- HD Endoscopic camera, Monitor, recording system and telescopes

- Full HD resolution/ CMOS Camera, with C-Mount adapter for use with endoscopes
- White balance, boost function
- The system should be compatible for attachment to any make endoscope.
- Aspect Ratio: 16:9, Resolution 1920 X 1080
- Video outputs: 1x HDMI/ DVI
- The monitor should be 22 inch or more, medical grade HD LED resolution and Connectivity.
- The Monitor should be installed on a spring arm mounted on the Unit column for easy viewing.
- The camera CCU should have an option of recording videos and Capturing images on USB Drive via USB port.
- The Camera head should have buttons for Recording, capturing and managing all functions of the camera unit.
- Power supply: 220-240 volts/50Hz
- A HD recording (Audio/ visual) software with a suitable desktop computer and coloured printer should be provided.
- Telescope 0°, Enlarged View, Diameter 4 mm, Working Length 170-180 mm, Autoclavable- 1 nos.
- Telescope 45°, Enlarged View, Diameter 4 mm, Working Length 170-180 mm, Autoclavable- 1 nos.
- Telescope 0°, Enlarged View, Diameter 2.7 mm, Working Length 170-180 mm, Autoclavable- 1 nos.
- Telescope 70°, Enlarged View, Diameter 4 mm, Working Length 170-180 mm, Autoclavable- 1 nos.
- Long curved nasal antral cannula with Luer lock having outer diameter of 4 mm and length of 15-16 cms, should be provided with the endoscopes: 2 in number
- The Fraenkel forceps, 20- 22 cms working length, should be of Vertical biting style (2 in nos.) and Horizontal biting (2 in nos.), for taking biopsy.

#### 6- HF Cautery/ diathermy unit:

- The Cautery unit should be of wattage suitable for ENT procedures.
- Should be with both Monopolar and Bi-Polar settings
- Should be supplied with reusable patient plate: 2 nos.
- Reusable cables for Bipolar: 5 nos.
- Reusable cables for monopolar: 2 nos.
- Power supply: 220-240 volts/50Hz
- The following forceps should be provided:



Dr. Ashish Chandra Agarwal  
MS (ENT), MRCS Ed.  
Additional Professor  
Dept. of ENT  
Dr. R.M.L.I.M.S., Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

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1. Bipolar coagulating forceps, insulated, straight shaft, angled and blunt tip, tip 1.2 mm diameter, working length 15-16 cms- 2 in number.
  2. Unipolar nasal needle electrode, working length 9-10 cms- 2 in number.
  3. Unipolar nasal electrode, ball end, working length 9-10 cms- 2 in number.

#### 8 - Otoscope:

- Integrated with the unit/ wall mounted
- LED light.
- Magnification 2 times or more.
- Pneumatic bag for sieglisation of tympanic membrane.
- Reusable and autoclavable speculum set of 4 or more- 2 sets
- Stainless steel ear speculum holder, (4x6)- Qty-1

#### 9- UPS:

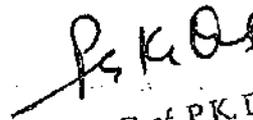
A UPS system with atleast 15 minutes backup should be supplied and installed with the system.

#### General Terms:

- Prior demo should be given if required.
- Consumables required for proper functioning of the equipments should be provided of the same make.
- The equipments provided should be of the same make.
- The equipment should have brand name / model number embossed / etched on the equipment.
- The equipments should be CE certified.
- Appropriate size containers for storage and sterilisation should be provided.
- The company should have service facility in Uttar Pradesh



Dr. Ashish Chandra Agarwal  
MS (ENT), MRCSEd.  
Additional Professor  
Dept. of ENT  
Dr. R.M.L.I.M.S., Lucknow



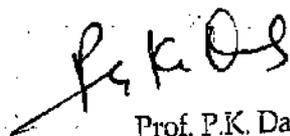
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**ENT Operating Microscope: specifications** 231

1. The equipment should have 5 step apochromatic magnification.
2. Should have in- built red, green and orange filter.
3. Magnification range from 2x to 18x or more.
4. Fine focussing lens of F= 250 mm and F= 400 mm should be provided.
5. The equipment should have Tiltable binocular tubes and a knob for adjustment of inter- pupillary distance.
6. The equipment should have 10x/ 12.5x push in eye pieces and should be suitable for spectacle wearers.
7. Illumination: High intensity LED/ Xenon illumination.
8. Stand: stable and sturdy on 4 or more lockable castors
9. The equipment should have integrated full HD camera (1920\*1080p) and integrated full HD recorder.
10. Medical Grade Flat Screen HD LED Monitor for use with microscope, having a resolution of 1920 x 1080 pixels should be provided.
11. There should be a provision to capture still images and videos of the surgeries and store it on an external drive.
12. There should be a provision to broadcast the live surgery on an external medical grade monitor.
13. The equipment should have a provision to be used with LASER.
14. The equipment should have handgrips. Dust cover and sterilizable caps for knobs and handgrips should be provided.
15. Attachments and consumables required for proper functioning of the equipment should be provided and be of the same make.
16. The equipment should be European CE/ USFDA approved.
17. The company should have service facility in Uttar Pradesh.



Dr. Ashish Chandra Agarwal  
MS (ENT), MRCS Ed.  
Additional Professor  
Dept. of ENT  
Dr. R.M.L.I.M.S., Lucknow

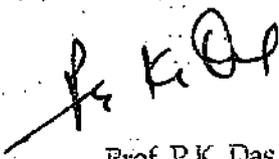


Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

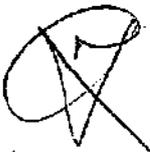
## Rigid Esophagoscope Set

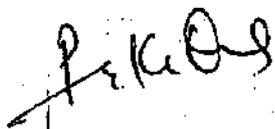
S. no	Instrument description	Qty.
<b>Esophagoscopes</b>		
1.	Rigid Esophagoscope, distal illumination, oval, length 50 cm, O.D. 12 mm x 16 mm	1
2.	Rigid Esophagoscope, distal illumination, oval, length 50 cm, O.D. 10 mm x 14 mm	1
3.	Rigid Esophagoscope, distal illumination, oval, length 50 cm, O.D. 8 mm x 12 mm	1
4.	Rigid Esophagoscope, distal illumination, oval, length 40 cm, O.D. 12 mm x 16 mm	1
5.	Rigid Esophagoscope, distal illumination, oval, length 40 cm, O.D. 10 mm x 14 mm	1
6.	Rigid Esophagoscope, distal illumination, oval, length 40 cm, O.D. 8 mm x 12 mm	1
7.	Rigid Esophagoscope, distal illumination, oval, length 30 cm, O.D. 12 mm x 16 mm	1
8.	Rigid Esophagoscope, distal illumination, oval, length 30 cm, O.D. 10 mm x 14 mm	1
9.	Rigid Esophagoscope, distal illumination, oval, length 30 cm, O.D. 8 mm x 12 mm	1
10.	Rigid Esophagoscope, distal illumination, oval, length 30 cm, O.D. 7 mm x 10 mm	1
11.	Rigid Esophagoscope, distal illumination, oval, length 20 cm, O.D. 12 mm x 16 mm	1
12.	Rigid Esophagoscope, distal illumination, oval, length 20 cm, O.D. 10 mm x 14 mm	1
13.	Rigid Esophagoscope, distal illumination, oval, length 20 cm, O.D. 8 mm x 12 mm	1
<b>Rigid esophagoscope forceps</b>		
14.	Forceps, pointed, serrated, for coins and flat foreign bodies, double-action jaws, sheath diameter 2.5 mm working length 55 cm	1
15.	Forceps, with round cupped jaws, for biopsy and foreign bodies, double-action jaws, cupped diameter 5 mm sheath diameter 2.5 mm working length 55 cm	1
16.	Forceps, alligator, for hard foreign bodies, double-action jaws, sheath diameter 2.5 mm working length 55 cm	1

  
 Dr. Ashish Chandra Agarwal  
 MS (ENT), MRCS Ed.  
 Senior Lecturer Professor  
 Dept. of ENT  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

17	Forceps, universal, for biopsy and foreign bodies, double-action jaws, width 3 mm, sheath diameter 2.5 mm, working length 45 cm	2
	Forceps, with round cupped jaws, for biopsy, double-action jaws, cupped diameter 4 mm, sheath diameter 2 mm, working length 45 cm	1
18	Forceps, alligator grasping, for hard foreign bodies, double-action jaws, sheath diameter 2 mm, working length 45 cm	2
19	Forceps, pointed, serrated, for coins and flat foreign bodies, double-action jaws, sheath diameter 2 mm, working length 35 cm	2
	Forceps, with round cupped jaws, for biopsy, double-action jaws, cupped diameter 4 mm, sheath diameter 2 mm, working length 35 cm	1
20	Forceps, alligator grasping, for hard foreign bodies, double-action jaws, sheath diameter 2 mm, working length 35 cm	1
23	Denture cutting scissors, working length 45-47 cm	1
<b>Light cable, light source and accessories</b>		
24	Fiber optic light cable with straight connector, heat resistant, with safety lock, diameter approx. 3.5 mm, length 230- 250 cms	1
25	High performance LED light source, power supply 100 - 240 VAC	1
26	Fiber Optic Light Carrier for use with rigid esophagoscopes of length 50 cm	1
27	Fiber Optic Light Carrier for use with rigid esophagoscopes of length 40 cm	1
28	Fiber Optic Light Carrier for use with rigid esophagoscopes of length 30 cm	1
29	Fiber Optic Light Carrier for use with rigid esophagoscopes of length 20 cm	1
30	Autoclavable prismatic light deflector with connection to fiber optic light cable	2
31	Handle, universal for all esophagoscopes	2
32	Metallic Suction cannula, with grip and suction control for use with esophagoscope of length 50 cms, size 1 and 2	1 each

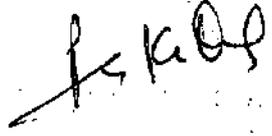
  
 Dr. Ashish Chandra Agarwal  
 Page 2 of 3 (ENT), MRCS Ed.  
 Additional Professor  
 Dept. of ENT  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

33	Metallic Suction cannula, with grip and suction control for use with esophagoscope of length 40 cms, size 1 and 2	1 each
34	Metallic Suction cannula, with grip and suction control for use with esophagoscope of length 30 cms, size 1 and 2	1 each
35	Metallic Suction cannula, with grip and suction control for use with esophagoscope of length 20 cms, size 1 and 2	1 each
36	Appropriate sized containers for storage and sterilisation of equipments	2

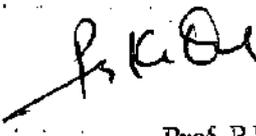
1.  $\pm$  10% variation in size range is acceptable
2. TC inlay should be welded and not pasted.
3. Instruments should be made from high quality surgical grade steel.
4. Instruments should have Laser surface or ebonized or equivalent finish to provide appropriate reflection lowering property.
5. The instruments should be light weight, strong, with high precision and durable.
6. The instruments should be non-magnetic.
7. Catalogue number and article number should be mentioned on each instrument.
8. There should be country of origin/ manufacturing engraved on each instrument.
9. The instruments should be CE certified.
10. The instruments should be autoclavable.
11. All instruments should be of the same make

  
 Dr. Ashish Chandra Agarwal  
 MS (ENT), MRCS Ed.  
 Additional Professor  
 Dept. of ENT  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

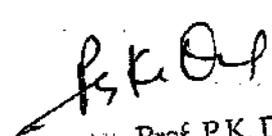
Head & Neck surgery instruments		
S.N.	Item description	Qty. required
1.	Needle holder, long, fine tip, length 20-22 cm	1
2.	Skin hook, small curve, length 15-20 cm.	2
3.	Skin hook, large curve, length 15-20 cm	2
4.	Metzenbaum scissors, curved, length 14-16 cm	1
5.	Metzenbaum scissors, heavy model, length 18-20cm	1
6.	Suture cutting scissors	2
7.	Delicate needle holder with spring action, length 17-20 cm	2
8.	Crile wood needle holder, length 14-17 cm.	2
9.	Atraumatic Tissue forceps, non tooth, length 15-16 cm	2
10.	Atraumatic Tissue forceps, non tooth, length 18-20 cm	2
11.	Adson's non tooth tissue forceps, length 12-13 cm	2
12.	Adson's toothed tissue forceps, length 12-13 cm	2
13.	Cricoid hook, blunt, length 15-20 cm.	1
14.	Trousseau Tracheal dilator, length 15-20 cm	1
15.	Mosquito forceps, slender, straight, length 18-20 cm	5

Dr. Ashish Chandra Agarwal  
MS (ENT), MRCS Ed.  
Additional Professor  
Dept. of ENT  
Dr. R.M.L.I.M.S., Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

16.	Mosquito forceps, slender, curved, length 18-20 cm	5
17.	Mosquito forceps, slender, fine tip, straight, length 8-10 cm	5
18.	Mosquito forceps, slender, fine tip, curved, length 8-10 cm:	5
19.	Mosquito forceps, slender, straight, length 12-14 cm	5
20.	Mosquito forceps, slender, curved, length 12-14 cm	5
21.	Negus long right angled (90 degree) forceps 20-22 cm	2
22.	Negus long 45 degree angled forceps 20-22 cm	2
23.	Kocher's clamp, 20-22 cm	1
24.	Bulldog clamp	1
25.	Towel clips, with serrated inserts, length 8-10 cm	10
26.	Iris scissors straight	1
27.	Iris scissors curved	1
28.	Langenbeck retractor, length 20-25 cm, size 2,3	5 each
29.	Langenbeck retractor, with rectangular blade, length 20-25 cm	5
30.	Czernys retractor, double sided	5
31.	Tongue holding forceps, length 15-20 cm	2
32.	Cheatle forceps with stand	2 each
33.	Tooth extractor	2
34.	Allis forceps	10
35.	Babcock forceps	10
36.	Doyens mouth gag: for pediatric use	1

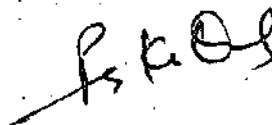
  
 Dr. Ashish Chandra Agarwal  
 MS(ENT), MRCS Ed.  
 Additional Professor  
 Dept. of ENT  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

37.	Doyens mouth gag: for adult use	1
38.	Bard parker knife handle	5
39.	Container for storage and sterilization of head and neck surgery instruments	4

1.  $\pm 10\%$  variation in size range is acceptable
2. TC inlay should be welded and not pasted.
3. Instruments should be made from high quality surgical grade steel.
4. Instruments should have Laser surface or ebonized or equivalent finish to provide appropriate reflection lowering property.
5. The instruments should be light weight, strong, with high precision and durable.
6. The instruments should be non-magnetic.
7. Catalogue number and article number should be mentioned on each instrument.
8. There should be country of origin/ manufacturing engraved on each instrument.
9. The instruments should be CE certified.
10. The instruments should be autoclavable.
11. All instruments should be of the same make.

  
 Dr. Ashish Chandra Agarwal  
 MS (ENT), MRCS Ed.  
 Additional Professor  
 Dept. of ENT.  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**Console**

- The various parameters should be able to be adjusted either from console or from the multifunction foot switch or both.
- Should have inbuilt pumps each for Irrigation (5 cc / min to 100 cc / min or more) and Cooling.
- The foot pedal should be water tight and the cable length should be 3 metre or more.
- Should be able to control Speed / Mode, Forward / Reverse toggle.
- Should have option for remote control irrigation to operate from sterile area
- Should have in built scope lens cleaning system.
- Should have the provision to mount the console on various sizes of IV pole
- Should have two pumps

**Microdebrider**

- Able to work at a speed of at least 30000 RPM in forward rotation and at least 5000 RPM in oscillation mode.
  - Have fingertip control to rotate only the tip of the blade up to 360 deg.
  - Have straight suction path to reduce clogging and allow efficient tissue removal.
  - Have integrated blade locking system to lock the blade tip rotation.
  - Have integrated side grooves and cable clips to provide better tubing management.
  - The body should be rust proof.
  - Zero, 12, 40, 60 degree blades (10 each) should be provided.
  - 90 and 120 degree blades (2 each) should be provided.
- 
- ❖ The accessories and consumables required for the proper functioning of these equipment should be provided.
  - ❖ All the equipment and accessories must be from the same manufacturer
  - ❖ The equipment should have brand name / model number embossed / etched on the equipment.
  - ❖ The equipment should have a CE certificate
  - ❖ The device should have an electrical certification of IEC 60601 & IEC 62304 and IPX (4/5/7) for water.
  - ❖ The company should have service facility in Uttar Pradesh

  
Dr. Ashish Chandra Agarwal  
MS (ENT), MRCS Ed.  
Additional Professor  
Dept. of ENT  
Dr. R.M.L.I.M.S., Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

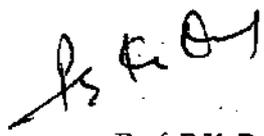
Console

- The console should recognise various hand pieces, viz. drill, saw.
- The various parameters should be able to be adjusted either from console or from the multifunction foot switch or both.
- Should have inbuilt pumps each for Irrigation (5 cc / min to 100 cc / min or more) and Cooling.
- The foot pedal should be water tight and the cable length should be 3 metre or more.
- Should be able to control Speed / Mode, Forward / Reverse rotation, Active hand piece change.
- Should have option for remote control irrigation to operate from sterile area
- Should have the provision to mount the console on various sizes of IV pole
- Should have two pumps
- Should have provision to connect facial nerve monitor with the Otologic drill.
- Should have provision to connect Oscillating, Reciprocating and Sagittal Saws.

Otology Drill

- Should be light weight, produce least level of sound, minimal heat and vibration.
- High speed drill 60000 RPM or more
- Should be designed for ENT surgical procedures:
- Forward and reverse movements should be possible.
- Should have pump, irrigation pipes and flexible irrigation settings
- Should be operated by Foot control.
- Straight hand piece: 2 nos.
- Contra angled hand piece: 2 nos.
- Tungsten carbide cutting burrs, set of 12, of various sizes: 3 sets
- Diamond burrs, set of 6, of various sizes: 2 sets
- Oil spray (2 nos) for hand piece with nozzle
- The accessories and consumables required for the proper functioning of these equipment should be provided.
- All the equipment and accessories must be from the same manufacturer
- The equipment should have brand name / model number embossed / etched on the equipment.
- The device should be CE certified.
- The device should have an electrical certification of IEC 60601 & IEC 62304 and IPX (4/5/7) for water.
- The company should have service facility in Uttar Pradesh

  
 Dr. Ashish Chandra Agarwal  
 MS (ENT), MRCS Ed.  
 Additional Professor  
 Page 1 of 4 of ENT  
 Dr. R.M.L.I.M.S., Lucknow

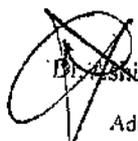
  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**Miscellaneous assorted ENT instruments**

240

S.N.	Item description	Quantity required
1	Toynbee's ear speculum of various sizes	5 sets
2	Slotted ear speculum of various sizes	5 sets
3	Bayonet forceps	5
4	Bulls lamp with all its accessories	5
5	Head mirror (for use with Bulls lamp)	5
6	Jobson Horn Probe	10
7	Ball probe (for use in ear)	10
8	Indirect Laryngoscopy Mirrors of various sizes (autoclavable): along with mirror handle	5 sets
9	Posterior Rhinoscopy Mirrors of various sizes (autoclavable): along with mirror handle	5 sets
10	Nasal Speculum: Thudicum	10
11	Nasal Speculum: Pilchers	10
12	Nasal Speculum: Vienna	10
13	Nasal suction: Curved with olive tip	10
14	Nasal suction: Straight of various sizes	5 sets
15	Ear Suction: Straight of various sizes	5 sets
16	Lacks tongue depressor of various sizes	5 sets
17	Tilleys forceps	10
18	Aural dressing forceps	10
19	Alligator forceps for use in ear	10
20	Cup forceps for use in ear	10
21	Tuning fork: 256 Hz	5
22	Tuning fork: 512 Hz	5
23	Tuning fork: 1024 Hz	5
24	Stainless steel Kidney tray	10
25	Stainless steel Sterilisation tray with lid	10
26	Frankel forceps	1
27	Blakesley forceps: straight	1
28	Blakesley forceps: 45 degree up turned	1

1.  $\pm 10\%$  variation in size range is acceptable
2. TC inlay should be welded and not pasted.
3. Instruments should be made from high quality surgical grade steel.
4. Instruments should have Laser surface or ebonized or equivalent finish to provide appropriate reflection lowering property.
5. The instruments should be light weight, strong, with high precision and durable.
6. The instruments should be non-magnetic.
7. Catalogue number and article number should be mentioned on each instrument.
8. There should be country of origin/ manufacturing engraved on each instrument.
9. The instruments should be CE certified.
10. The instruments should be autoclavable.
11. All instruments should be of the same make.

  
**Dr. Ashish Chandra Agarwal**  
 MS (ENT), MRCS Ed.  
 Additional Professor  
 Dept. of ENT  
 Dr. R.M.L.I.M.S., Lucknow

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## Oto Acoustic Emissions (OAE)

### A.1. Distortion Product Otoacoustic Emissions (DPOAE)

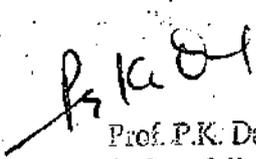
- A1.1. Frequency: up to 12 kHz
- A1.2. 4 Frequencies tested (3 for pass)
- A1.3. Average test time should be less than 10 sec.
- A1.4. SNR 6dB
- A1.5. DPOAE Stimulus Intensity Range: 40 to 70 dB SPL
- A1.6. Display: DP gram, Probe fit (Frequency & time), Spectrum, protocols.

### A.2. Transient Evoked Otoacoustic Emissions (TEOAE)

- A2.1. Frequency: 1 to 5 kHz
- A2.2. 6 Frequencies tested (3 for pass)
- A2.3. Average test time 64 sec.
- A2.4. SNR: 4dB
- A2.5. Stimulus Intensity Range: 83 dB SPL ( $\pm 3$  dB)
- A2.6. Maximum Output (protection): 90 dB SPL
- A2.7. Display: TEOAE Frequency response, probe fit (Frequency and time, including signal correlation)
- A2.8. Microphone System Noise: -20 dB SPL @ 2 kHz (1 Hz bandwidth) / -13 dB SPL @ 1 kHz (1 Hz bandwidth)
- A2.9. Stimulus Sampling Rate: 31,250 Hz
- A2.10. Scope of supply- OAE device, OAE probe, Probe holder kit, test cavity, Cleaning kit, starter kit, USB cable, Software, Manual/User guide, UPS
- A2.11. The equipment memory should have capacity to hold up to 3000 Patient Data and should be transferable to the PC/Laptop system.
- A2.12. OAEs should operate through PC/Desktop.
- A2.13. Should be supplied with branded Laptop with latest processor, 16 GB RAM (upgradable), 2TB HDD, 15" HD LED display, connectable to printer through LAN and WiFi when required..
- A2.14. Equipment should conform to US FDA/European CE standards.

PC/Laptops systems, wherever mentioned should include genuine/licensed operating system, licensed MS Office Home & Business (Latest Version), licensed Adobe Acrobat Full Version, licensed standard anti-virus software with all backup (DVD etc.) media of all the software and all the accessories to run the required software seamlessly.

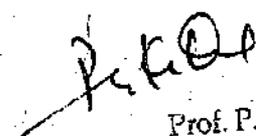
  
Dr. Ashish Chandra Agarwal  
MS (ENT), MRCS Ed.  
Additional Professor  
Dept. of ENT  
Dr. R.M.L.I.M.S., Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Technical Specification for Rigid Bronchoscopy set With Optical Forceps

	Description	Quantity required
1	Bronchoscope, length 30 cm, size 3.5 for use with proximal insertable prismatic light deflector	1
2	Bronchoscope, length 30 cm, size 4.5 for use with proximal insertable prismatic light deflector	1
3	Bronchoscope, length 30 cm, size 5, for use with proximal insertable prismatic light deflector	1
4	Bronchoscope, length 45 cm, size 6.5 for use with proximal insertable prismatic light deflector	1
5	Compatible telescope for above mentioned bronchoscope tube, straight forward scope 0 degree, length approx 50 cms, autoclavable. Fiber optic light transmission incorporated	1
6	Compatible telescope for above mentioned bronchoscope tube, straight forward scope 30 degree, length approx 50 cms, autoclavable. Fiber optic light transmission incorporated	1
7	Compatible optical forceps, Universal, for paediatric broncho-esophagoscopes, for use with telescope for removal of foreign bodies, denatured tissues, biopsy	1
8	Compatible optical forceps for paediatric broncho-esophagoscopes, for use with telescope for removal of peanuts and soft foreign bodies	1
9	Compatible optical Forceps, for peanuts and soft foreign bodies, double-action jaws, sheath diameter 2.5 mm, working length 50 cm	1
10	Forceps, universal, for biopsy and foreign bodies, double-action jaws, jaw width 4 mm, sheath diameter 2.5 mm, working length 50 cm	1
11	Bridge: Long	1
12	Bridge: medium	1
13	Bridge: short	1
14	Prismatic light carrier, autoclavable with connection to fiber light cable	1
15	Rubber telescope guide for use with telescope or optical forceps	1
16	Guide for suction catheter	1
17	Port for connecting ventilator	1
18	Sealing Cap with window for use with Bronchoscopes and Tracheoscopes	1
19	Sealing Cap with rubber seal for use with Bronchoscopes and Tracheoscopes	1
20	Adapter with sliding glass window plug, sealing cap, notched lens and keyhole opening, movable, for use with tracheoscopes and bronchoscopes	1
21	Adapter from bronchoscope to respirator, long model	1
22	Adaptor for respirator	1
23	Tube guide for bronchoscope	1
24	Injection Cannula, for positive pressure assisted ventilation system, O.D. 2.7 mm with LUER-lock	1

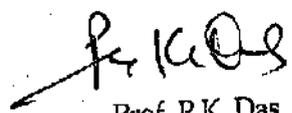
  
 Dr. Ashish Chandra Agarwal  
 MS (ENT), MRCS Ed.  
 Additional Professor  
 Dept. of ENT  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

25	Injection Cannula, for positive pressure assisted ventilation system, O.D. 3.5 mm with LUER-lock	1
26	Compatible suction tube, straight, with rubber tip, diameter 2 mm working length 35 cm	1
27	Suction Tube for Bronchoscope, O.D. 2.5 mm working length 50 cm	1
28	Suction Tube, insulated, working length 50 cm, compatible with bronchoscope	1
29	Cotton applicator, working 35 cm	1
30	Sponge, holder, spring handle, working length 35 cm	1
31	Case for storage and sterilization of the bronchoscopy equipments of the same make	1

1.  $\pm 10\%$  variation in size range is acceptable
2. TC inlay should be welded and not pasted.
3. Instruments should be made from high quality surgical grade steel.
4. Instruments should have Laser surface or ebonized or equivalent finish to provide appropriate reflection lowering property.
5. The instruments should be light weight, strong, with high precision and durable.
6. The instruments should be non-magnetic.
7. Catalogue number and article number should be mentioned on each instrument.
8. There should be country of origin/ manufacturing engraved on each instrument.
9. The instruments should be autoclavable.
10. All instruments should be of the same make and European CE/US FDA approved.

  
 Shish Chandra Agarwal  
 MS (ENT), MRCS Ed.  
 Additional Professor  
 Dept. of ENT  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## Septoplasty and FESS instruments

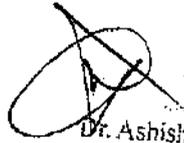
S.N.	Item description	Qty
1.	Blakesley forceps: straight: Small	1
2.	Blakesley forceps: straight: Large	1
3.	Blakesley forceps: 45 degree upturned: Small	1
4.	Blakesley forceps: 45 degree upturned: Large	1
5.	Blakesley forceps: 90 degree upturned: Small	1
6.	Blakesley forceps: 90 degree upturned: Large	1
7.	Tru-cut forceps: Straight: Small	1
8.	Tru-cut forceps: Straight: Large	1
9.	Tru-cut forceps: Upturned: Small	1
10.	Tru-cut forceps: Upturned: Large	1
11.	Stamberger back biting forceps: 360 degree rotatable: Small	1
12.	Stamberger back biting forceps: 360 degree rotatable: Large	1
13.	Sickle knife for nose	1
14.	Curette : 55 degree curved	1
15.	J-curette	1
16.	Double ended ball probe for maxillary sinus	1
17.	Double ended ball probe for frontal sinus	1
18.	Straight ball probe	1
19.	Mushroom forceps	1
20.	Tilleys nasal dressing forceps	1
21.	Giraffe forceps: 55 degree	1
22.	Giraffe forceps: 90 degree	1
23.	Olive tip curved suction: small	1
24.	Olive tip curved suction: Large	1
25.	Straight suction cannula with thumb control: Small	1
26.	Straight suction cannula with thumb control: Large	1
27.	Takahashi forceps	1
28.	Irwin moore forceps	1
29.	Mallet for use in nose	1
30.	Googe for use in nose	1
31.	Chisel for use in nose	1
32.	Turbineotomy scissors	1
33.	Endoscopic scissors: straight	1
34.	Endoscopic scissors: upturned	1
35.	Viennas nasal speculum	1
36.	Kilians self retaining nasal speculum	1
37.	DCR punch	1
38.	Sphenoid sinus punch	1
39.	Punctum dilator	1
40.	Lacrimal probe	1

  
 Dr. Ashish Chandra Agarwal  
 MS (ENT), MRCS Ed.  
 Additional Professor  
 Dept. of ENT  
 Dr. R.M.L.I.M.S., Lucknow

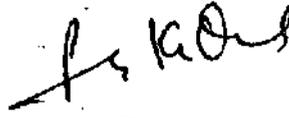
  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

41.	Syringing needle (for use during DCR)	1
42.	Suction Freer's elevator	1
43.	Ballenger knife	1
44.	Harpoon	1
45.	Trocar and Rasp	1
46.	Nasopharyngeal biopsy forceps	1
47.	Appropriate size container for storage and sterilisation of instruments	2
48.	Cordless headlight with rechargeable battery	1

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Dr. Ashish Chandra Agarwal  
MS (ENT), MRCS Ed.  
Additional Professor  
Dept. of ENT  
Dr. R.M.L.I.M.S., Lucknow



Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Instruments for Microlaryngoscopy Surgery

### Distending Laryngoscopes with Accessories

1. Distending Operating Laryngoscope, Large, for adults length 16-20 cm
2. Distending Operating Laryngoscope for children, length 12-15 cm
3. Fiber optic light carrier, for use with above laryngoscopes (1 each.)
4. Injection Cannula for positive pressure assisted ventilation for use with above laryngoscopes (1 nos.)

### Standard Laryngoscope with Accessories

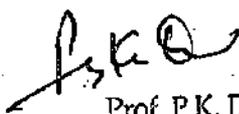
5. Kleinsasser operating laryngoscope, large.
6. Kleinsasser Operating laryngoscope, medium.
7. Kleinsasser Operating laryngoscope, small.
8. Fiber optic light carrier, for use with the above laryngoscopes (1 each.)
9. Teeth protector Metallic (1 Qty)
10. Teeth protector Silicon (5 Qty)

### Laryngoscope Holder (with attachment for OT Table)

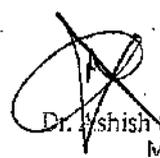
11. Laryngoscope holder and Chest Support, rod with metal ring, diameter approx. 9cm, length approx. 30-35 cm.
12. Attachment for use of Laryngoscope Holder above with OT Tables having standard Rail System

### Operative Instruments

  
 Dr. Anish Chandra Agarwal  
 MS (ENT), MRCS Ed.  
 Additional Professor  
 Dept. of ENT  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

- 13. Needle Holder, it should be with ratchet, working length approx. 20-25 cm
- 14. Laryngeal biopsy forceps, it should be heavy, approx. size 3X4 mm, working length should be 20-25 cm
- 15. Scissors, straight, working length approx. 20-25 cm
- 16. Alligator forceps, serrated, straight working length approx. 20-25 cm
- 17. Scissors, it should be angled 45 deg, curved to right (1 nos.), curved to left (1 nos.), working length approx. 20-25 cm
- 18. Hook, blunt (1 nos.) and sharp (1 nos.), with probe button, working length approx. 20-25 cm
- 19. Knot tier, working length approx. 20-25 cm
- 20. Needle, curved to left (1 nos.) and curved to right (1 nos.), working length approx. 23 cm.
- 21. Laryngeal Knife, sickle- shaped (1 nos.), golf club- shaped (1 nos.), and oval straight (1 nos.) working length approx. 23 cm
- 22. Handle compatible with above instruments (4 nos.)
- 23. Suction Elevator, working length approx. 20-25 cm
- 24. Suction Tube, outer diameter should be around 2.5 mm
- 25. Injection Needle, Luer-Lock, Straight
- 26. Suction and Coagulation Tube, It should be insulated, outer diameter around 3mm
- 27. Unipolar High frequency cord, with 5 mm plug, length 250-300 cm (2 Qty)
- 28. Bipolar Forceps, Length 23 cms, with 45 Degree upturned jaws
- 29. Bipolar High Frequency cord (2 Qty)
- 30. Grasping Forceps, serrated, sheath insulated, working length 20-23 cm- Straight, curved to right (1 nos.) and curved to left (1 nos.)
- 31. Distending forceps, for atraumatic retraction of true vocal cords and false vocal cords, distal end with blunt curved blades, self retracting, with ratchet, working length 20-25 cm

  
 Dr. Vishish Chandra Agarwal  
 MS (ENT), MRCS Ed.  
 Additional Professor  
 Dept. of ENT  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

32. Grasping Forceps, alligator jaws, with 1X2 teeth, double action jaws, shaft with suction channel, handle with ratchet, working length 30-35 cm
33. Malleable distal tip instrument – cupped jaws forceps,
34. Malleable distal tip instrument - serrated jaws forceps
35. Malleable distal tip instrument - triangular jaws forceps
36. Malleable distal tip instrument – scissors
37. Containers for Storage and Sterilization (2 Qty)
38. LED Light Source with Light Cable

- A Powerful LED Lamp (intensity equivalent to 300 watts or more Halogen) with atleast 30,000 hrs lamp life.
- An Autoclavable type fiber optic light guide cable (1 nos) to be provided for better protection against mechanical and thermal stress
- The cable should have a small bending radius, and the length should be 3 meters or more.

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 Additional Professor  
 Dept. of ENT  
 Dr. R.M.L.I.M.S., Lucknow

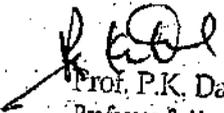
  
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 Dr. RMLIMS, Lucknow

**Brainstem Evoked Response Audiometer (BERA) BERA**

- A1.1. 2 channels.
  - A1.2. Windows based.
  - A1.3. Bone Conduction.
  - A1.4. Integrated database.
  - A1.5. Pre-programmed auto tests or protocols.
  - A1.6. Waveform reproducibility indication.
  - A1.7. Split left/right recordings.
  - A1.8. Simultaneous recording of condensation rarefaction stimuli.
  - A1.9. Normative data indication.
  - A1.10. Wave editing during testing
  - A1.11. Digital filter application (during and after test).
  - A1.12. Add, subtract curves
  - A1.13. Low noise amplifier
  - A1.14. EcochG recordings with markers
  - A1.15. Middle Latency, Late Latency Device should be upgradeable with P300, MMN.
  - A1.16. Device should have inbuilt Preamplifier –
  - A1.17. Accessories to include- suitable table and patient chair, cup EP electrodes (40 Nos.), Button electrodes (40 Nos.), Insert earphone (2 Nos.), Conductive Paste (20 Nos.) and Abrasive Paste (40 Nos.).
  - A1.18. Equipment should conform to US FDA/European CE standards.
- A.2. ASSR: The equipment should be capable of performing an ASSR test.**
- A2.1. Stimulus Rate : 40 or 90 Hz
  - A2.2. Masking: White Noise 0-100 dB SPL
  - A2.3. Display: Stimuli Level and Frequency
  - A2.4. ASSR and Audiogram
  - A2.5. Customer selectable correction factor available
  - A2.6. Impedance Check
  - A2.7. All accessories should be from the same vendor.
  - A2.8. Should have adjustable latency – intensity norms
  - A2.9. The equipments should be supplied with branded PC with latest Intel processor, 16 GB RAM (upgradable), 2TB HDD, 22" HD display with compatible coloured laserjet printer with Duplex printing, USB, LAN and WiFi connectivity, with compatible WiFi/LAN router, online UPS and computer table of adequate size and design.
  - A2.10. Equipment should conform to US FDA/European CE standards.

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 Additional Professor  
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 Dr. R.M.L.I.M.S., Lucknow

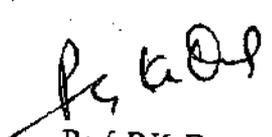
  
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 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**Diagnostic Immitance Meter**

- A1.1. Compliance 0.1 to 3.0 ml or more.
- A1.2. Probe tone level and accuracy: 226Hz +/-2%; 85dBSPL +/-2dB 1000Hz +/-2%; 79dBSPL +/-2dB over ear canal volume range
- A1.3. Pressure range and accuracy: +200daPa to -400daPa +/-10daPa or +/-10% (whichever is larger) over range 0.1ml to 5ml. Direction of sweep: Positive to negative pressure
- A1.4. Volumetric range and accuracy: 226Hz: 0.2ml to 5ml; 1000Hz: 0.1ml to 5ml +/-0.1ml or +/-5% (whichever is larger)
- A1.5. Analysis performed: Admittance peak level in ml (226Hz) or mΩ (1000Hz) & pressure at peak; Gradient in daPa (for 226Hz); Ear Canal Volume (ECV), Measurement sweep speeds: Selectable: 100, 200 or 300 daPa/sec.
- A1.6. Test Time- < 3 Seconds
- A1.7. Reflex Mode
- A1.8. Test Frequencies- 500, 1000, 2000, 4000 Hz ±2%
- A1.9. Test Method- Ipsilateral, Contralateral
- A1.10. Reflex levels: Ipsilateral: 70dBHL to 100dBHL (+/-3dB)
- A1.11. Reflex levels: Contralateral: 70dBHL to 110dBHL (+/-3dB)
- A1.12. Reflex detection threshold: 0.01ml to 0.5ml +/-0.01ml (configurable in 0.01ml steps)
- A1.13. Analysis performed: Reflex maximum amplitude and pass/fail at each test level
- A1.14. Series of fixed intensities
- A1.15. Test - Ipsilateral Reflex Test with AGC
- A1.16. Test Programme- Reflex Test selectable
- A1.17. Probe - Light weight, adjustable, Hand Held , With Built in control light & switch
- A1.18. Printer- Silent Thermal Printer , (with paper printer facility)
- A1.19. Display-Graphic LCD with adjustable contrast
- A1.20. Power Supply- Mains 100-240 Volts, 50/60 Hz 25 VA
- A1.21. PC Interface- USB Cable
- A1.22. Automatic self-calibration
- A1.23. Regular calibration of equipment.
- A1.24. Equipment should conform to US FDA/European CE standards.

PC/Laptops systems, wherever mentioned should include genuine/licensed operating system, licensed MS Office Home & Business (Latest Version), licensed Adobe Acrobat Full Version, licensed standard anti-virus software with all backup (DVD etc.) media of all the software and all the accessories to run the required software seamlessly.

  
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 Dr. Rishu Chandra Agarwal  
 MS (ENT), MRCS Ed.  
 Additional Professor  
 Dept. of ENT  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM

<b>Image guided Head and Neck Surgery System</b>	
<b>DESCRIPTION</b>	
1	<b>System Specifications</b>
1.1	The system should be easy to set up, user friendly, Intuitive and should work under Windows/Linux/Unix operating system environment.
1.11	The system should be a single cart portable system with wheels so can be easily moved in the OT environment and with all peripheral accessory connections embedded in the cart.
1.12	The system should be provided with Keyboard and mouse apart from touchscreen monitor.
1.13	The display should be of full HD resolution of 1920X1080 with monitor size not less than 27".
1.14	The system should have Rapid data transfer directly to the navigation station with the option of USB port for direct data import and also provision for integration with the hospitals PACS system
1.15	The system should have facility to load patient data into the system through CD/DVD, USB and PACS.
1.16	The system should have Wireless as well as wired options available for connecting to hospital PACS system.
1.17	The wireless options should be provided with inbuilt security features such as antivirus.
1.18	The system should have password protection so that only authorised user can access the system software.
1.19	The system must work on electromagnetic technology and it must have electromagnetic based dynamic referencing so that registration is not lost even if the patient moves.
1.2	The system should not have any line of sight issue.
1.21	The system should have an UPS with backup of atleast 5 minutes in case of power supply failure.
1.22	The system should have enough storage space for accessories and should be easily accessible.
2	<b>ENT Navigation Software Specifications</b>
2.1	The ENT navigation software should be user friendly, easy to use and should have capability to alter workflow as per surgeon preference.
2.11	The software should allow to create multiple surgeon profile and set procedures and settings as per the surgeon requirement.
2.12	The software should allow DICOM images in Axial, Sagittal or Coronal planes and should be reconstructed as 3D images and advanced planning can be done on any plane which should be adapted to all planes automatically
2.13	The software should have Image merge option in order to merge CT and MRI images and use them during navigation as per surgeons choice.
2.14	The software should have advanced 3D model building functions. It should have automatic tumor building function using seed points.
2.15	The software should have option to feature to view cut planes which allows sectional view of 3D models.

2.16	The software should have option to use Tracer based registration and touch based using fiducials or anatomic landmark based registration and if required combination of trace and touch registration.
2.17	The software should display the area of accuracy with the help of sphere and it should show which area is not covered during registration in order for the surgeon to modify registration if required.
2.18	The software should be capable of storing previous registrations for that patient.
2.19	The software should have facility to store screenshots taken during procedure as well as record the navigation screen for about about 30minutes.
2.20	The software should have option to perform Standard FESS, Endoscopic Skull base and Lateral Skull base procedures.
2.21	The software should have option to view endoscopic or microscopic video on the screen
2.22	The software should be ready to navigate navigable debriider blades.
2.23	The software should have virtual endoscopic view feature to view 3D models.
3	<b>ENT Navigation Instruments and accessories</b>
3.1	The system should be provide with electromagnetic generator which can be positioned under patient head and over the table in order to minimize table metal interference or side mounted electromagnetic generator attached to the table bedrail.
3.11	The system should be provide with the ENT instruments which are navigable under electromagnetic technology.
3.12	The instruments must include but not limit to a straight probe, straight suction, 90 degree curved suction, 70 degree curved suction and ostium seeker.
3.13	The instruments must be autoclavable for multiple use.
3.14	The instrument consumables required for navigation should be provided along with the system sufficient for about 20 surgeries.
3.15	The system should be provided with atleast 4 malleable suctions for skull base procedures.
3.16	They system should have pediatric friendly reference frame which can just be pasted on the head instead of the head band.
3.17	The system should allow connecting upto 6 instruments at the same time and navigate them as required.
3.18	The system should also have an option to include automated calibrated Blades for Navigation
3.19	The system should be provided with 3 navigable debriider blades.
4	<b>Support Specifications</b>
4.1	Company should provide proper training on the system for surgeons and technicians at the hospital.
4.11	System should be provided with the operating manual.
4.12	Company should provide high quality after sales service in the state of Uttar Pradesh
4.13	Company should provide US FDA/ European CE certificate
4.14	All components of the equipment must be of the same make.



Dr. Ashish Chandra Agarwal  
MS (ENT), MRCS Ed.  
Additional Professor  
Dept. of ENT  
Dr. R.M.L.I.M.S., Lucknow

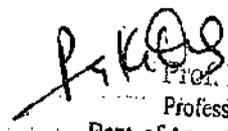


Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Rhinoplasty and fracture nasal bone reduction set

<u>Septo-Rhinoplasty Set</u>		
1	Retractor, Nasal. Aufricht. 4cm. Blade. 16.5cm/6.5".	1
2	Retractor, Nasal. Aufricht. 6cm. Blade. 16.5cm/6.5".	1
3	Retractor, Kilner. Alae. 2Prongs. Sharp. 10mmwide. 10cm/4".	1
4	Retractor, Kilner. Alae. 2Prongs. Sharp. 13mmwide. 10cm/4".	1
5	Retractor, Fomon/Joseph. 2Prongs-Balltipped. 10mm W. Length 16cm/6.25".	1
6	Retractor, Cottle. 2Prongs-Sharp. 12mm W. Length 14cm/5.5".	1
7	Retractor, Cottle. 2Prongs-Lt. Sharp. 12mm W. Length 14cm/5.5".	1
8	Retractor, Cottle. 4Prongs Blunt. 10mm W. Length 14cm/5.5".	1
9	Retractor, Alar. Cottle. 13mm W x 22mm D. 15cm/6".	1
10	Hook, Tenaculum. Shallow Curved, 15cm/6".	1
11	Hook, Tenaculum. Deep Curved, 15cm/6".	1
12	Hook, Skin. 2mm. Gillies. 16cm/6.25".	1
13	Hook, Skin. 4mm. Gillies. 16cm/6.25".	1
14	Hook, Skin. 2mm. McIndoe. 19cm/7.25".	1
15	Hook, Skin. 3mm. McIndoe. 19cm/7.25".	1
16	Hook, Skin. 4mm. McIndoe. 19cm/7.25".	1
17	Knife, Joseph. Buttonend. Straight 15cm/6".	1
18	Elevator, Farabeuf. 8mm, Curved 15cm/6".	1
19	Elevator, Septum. Masing. D/E. 22cm/8.75".	1
20	Forceps, Adson. 1mm. Cross. Serrated. 12cm/4.75".	1
21	Forceps, Adson. 1mm. 1x2Tth. 12cm/4.75".	1
22	Forceps, Adson. 1.5mm. Serrated. 12cm/4.75".	1
23	Forceps, Adson. 1.5mm. 1x2Tth. 12cm/4.75".	1
24	Fine Operating/Iris Scissors, SS. Straight 9cm/3".	1
25	Fine Operating/Iris Scissors, SS. Curved 9cm/3.5".	1
26	Joseph Scissors, SS. Straight 14cm/5.5".	1
27	Joseph Scissors, SS. Curved 14cm/5.5".	1
28	Metzenbaum Scissors, Curved 10cm/4".	1
29	Metzenbaum Scissors, Curved 12.5cm/5".	1
30	Scissors, Reynolds. 13cm/5.25".	1
31	Jameson Scissors. 14cm/5.5".	1
32	Chisel. 6mm. Cottle. Graduated. 18cm/7.25".	1
33	Chisel. 7mm. Cottle. Graduated. 18cm/7.25".	1
34	Chisel. 9mm. Cottle. Graduated. 18cm/7.25".	1
35	Chisel. 12mm. Cottle. Graduated. 18cm/7.25".	1
36	Chisel. Fishtail. 16mm. Cottle. 18cm/7.25".	1
37	Osteotome. Walter. 2mm. 19cm/7.25".	1
38	Osteotome. Walter. 3mm. 19cm/7.25".	1
39	Osteotome. Walter. 4mm. 19cm/7.25".	1
40	Osteotome. Walter. 7mm. 19cm/7.25".	1
41	Osteotome. Walter. 9mm. 19cm/7.25".	1
42	Osteotome. Walter. 12mm. 19cm/7.25".	1
43	Chisel, Nasal. McIndoe. 11mm. 16cm/5.5".	1
44	Chisel, Nasal. McIndoe. 13mm. 16cm/5.5".	1
45	Chisel, Nasal. Silver/Masing. Straight 18cm/7".	1
46	Chisel, Nasal. Silver/Masing. Cvd. Rt. 18cm/7".	1

  
 Dr. Ashish Chandra Agarwal  
 MS (ENT), MRCS Ed.  
 Additional Professor  
 Dept. of ENT  
 Dr. R.M.L.M.S., Lucknow

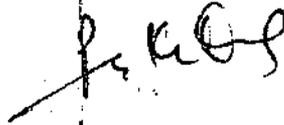
  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

47	Chisel, Nasal, Silver/Masing, Cvd. Lt. 18cm/7".	
48	Walsham forceps Right	1
49	Walsham forceps Left	1
50	Ash forceps	1
51	Ballenger's wivel	1
52	Kerrison's rongeur (Small)	1
53	Kerrison's rongeur (large)	1
54	Luc's forceps - small	1
55	Nasal Scissors straight	1
56	Nasal Scissors curved	1
57	Nasal gouge	1
58	Mallet-100g	1
59	Bone Nibbler (single action & double action)	1
60	Container for storage and sterilization of the instruments	1 Each.
		3

1.  $\pm 10\%$  variation in size range is acceptable.
2. TC inlay should be welded and not pasted.
3. Instruments should be made from high quality surgical grade steel.
4. Instruments should have Laser surface or ebonized or equivalent finish to provide appropriate reflection lowering property.
5. The instruments should be light weight, strong, with high precision and durable.
6. The instruments should be non-magnetic.
7. Catalogue number and article number should be mentioned on each instrument.
8. There should be country of origin/ manufacturing engraved on each instrument.
9. The instruments should be CE certified.
10. The instruments should be autoclavable.
11. All instruments should be of the same make.



Dr. Ashish Chandra Agarwal  
MS (ENT), MRCS Ed.  
Additional Professor  
Dept. of ENT  
Dr. R.M.L.I.M.S., Lucknow



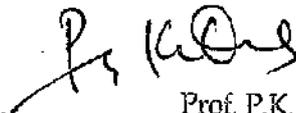
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**Temporal Bone Dissection Laboratory-Specifications**

S. No.	Item	Technical Specification	Qty
1.	Temporal Bone Dissection Lab	<ul style="list-style-type: none"> <li>• Integrated compact unit made of compressed wood board or equivalent, durable, long-lasting material containing properly fitted following equipments:               <ul style="list-style-type: none"> <li>❖ Integrated Suction Machine Noise Free</li> <li>❖ Integrated Irrigation System- Hands Free</li> <li>❖ Micro Scope- Integrated table mounted Microscope:-                   <ul style="list-style-type: none"> <li>a. Three Step Magnification: 5x, 10x &amp; 20x</li> <li>b. Eye Pieces: SWF 15x paired super wide field Working Dist: F=250mm Objective Lens Fine Focusing: Manual Fine Focusing</li> <li>c. Light Source: LED Light Source with bright white LED light. Arm: Counter balanced pantographic arm with 320° rotation. Power Supply: AC 220V-240V</li> </ul> </li> <li>❖ Micro Scope Camera Full HD</li> <li>❖ Medical Grade Monitor (LED) – 21" or above</li> <li>❖ Digital Micro Motor: reserve &amp; forward cutting with foot control, variable speed up to minimum 40,000 RPM, along with Hand Piece Straight (1 nos) &amp; curved (1 nos) for Micro Motor</li> <li>❖ Hand Piece Spray with Nozzle (2 nos.)</li> <li>❖ Temporal Bone Holder.</li> <li>❖ ENT Cutting Burr Set of 8 – Size-1 mm, 1.4 mm, 2.3 mm, 3.1 mm, 3.5 mm, 4.0 mm, 5.0 mm, 6.0 mm.</li> <li>❖ Oval Shaped Cutting Burr Set of Size- 4.0 mm, 5.0 mm, 6.0 mm.</li> <li>❖ Diamond Burr 3 pieces – Size- 1 mm, 2.3 mm, 4.0 mm.</li> <li>❖ Burr Stand</li> <li>❖ Instruments: 2 nos. of each of the following to be provided:                   <ul style="list-style-type: none"> <li>a. Micro Cup Forceps.</li> <li>b. Micro Crocodile Forceps.</li> <li>c. Micro Straight Needle.</li> <li>d. Micro Curved Needle.</li> <li>e. Micro Sickle Knife.</li> </ul> </li> </ul> </li> </ul>	1

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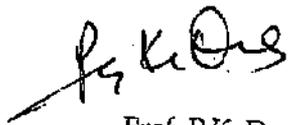
  
 Dr. Anish Chandra Agarwal  
 MS (ENT), MRCS Ed.  
 Additional Professor  
 Dept. of ENT  
 Dr. R.M.L.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLMS, Lucknow

		<p>f. Micro Right Angle Pick.</p> <p>g. Micro Instrument Box Stainless Steel.</p> <p>h. Micro forceps Plain.</p> <p>i. Adson Forces 1 to 2 Teeth.</p> <p>j. Set of Micro Suction Tips of various sizes with Adaptor.</p> <p>k. Suction Tube Ferguson.</p> <p>l. B.P. Handle (No.3).</p> <p>m. B.P. Handle Blade – 1 Box (No.11).</p> <ul style="list-style-type: none"> <li>❖ Instrument Drawer with Lock Small.</li> <li>❖ Instrument Drawer with Lock Medium</li> <li>❖ Drawer with Large Lock.</li> <li>❖ Hydraulic Chair with back support</li> </ul> <ul style="list-style-type: none"> <li>• Should be having facility of dissecting whole skull as well as temporal bone, with properly placed trays and drainage system.</li> <li>• Prior on site demo to be provided on requisition</li> <li>• All items should be of the same make</li> <li>• All items should be CE certified.</li> </ul>	
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1.  $\pm$  10% variation in size range is acceptable
2. TC inlay should be welded and not pasted.
3. Instruments should be made from high quality surgical grade steel.
4. Instruments should have Laser surface or ebonized or equivalent finish to provide appropriate reflection lowering property.
5. The instruments should be light weight, strong, with high precision and durable.
6. The instruments should be non-magnetic.
7. Catalogue number and article number should be mentioned on each instrument.
8. There should be country of origin/ manufacturing engraved on each instrument.
9. The instruments should be autoclavable.
10. The equipment and accessories should be CE certified.

  
 Dr. Ashish Chandra Agarwal  
 MS (ENT), MRCS Ed.  
 Additional Professor  
 Dept. of ENT  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## Nerve Monitoring System

257

Sr. No.	Description
1	The system must be multi channel EMG Monitoring module capable of monitoring cranial Motor/Mixed Nerves III, IV, V, VI, VII, IX, X, XI, and XII and peripheral motor nerves.
2	The monitor should have a HD display 1920 X 1080 and knobs for adjusting the current levels & audio.
3	System must be provided with multi channel patient-system interface module for electrode connections.
4	The system software must allow to create surgeon profile and save the profile for future use.
5	System should have pre-defined protocols for common procedures for ENT & Head and Neck applications and also have option to add custom procedures.
6	The equipment must show color coded electrode placement screen displayed on the main unit for accurate and faster electrode placement.
7	EMG signal must have audio and video representation of the signals.
8	System should have different sounds for current delivery and signal detection.
10	System should provide warning when amplitude and latency deviate from the baseline during periodic monitoring.
11	System software must plot graph from the captured EMG response after stimulation with probe to track the status of nerve over time.
12	Should have two constant current type stimulator ports capable to deliver current from 0.00 mA to 50 mA. System should provide warning if current level is increased above warning threshold.
13	Should have stimulating probe which can be used to adjust stimulation current level, save/capture screen and access the system menu directly from operative sterile field.
14	System should be provided with insulated monopolar and bipolar stimulating probe.
15	System should have option to include EMG hook wire electrode for intramuscular placement to obtain specific response.
16	Should have a muting option to reduce unwanted signals and artifacts especially monopolar cautery noise.
17	System should have option to connect to printer for printing case log records.
18	Should be able to get case log report and screenshots taken during surgery for patient records.
19	Should have latest USB port for connection with mass storage devices including compact flash drive.
20	System must be provided with patient Simulator for troubleshooting, system check and staff training & education purpose.
21	System must have inbuilt battery which can provide backup up to 5 mins, in case of power loss or must provide external UPS incase inbuilt battery is not available.
23	System should be US FDA or European CE approved.
24	The company should have service facility in Uttar Pradesh

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Dr. Ashish Chandra Agarwal  
MS (ENT), MRCS Ed.  
Additional Professor  
Dept. of ENT  
Dr. R.M.L.I.M.S., Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Tympanoplasty and mastoidectomy instruments		
S.N.	Item description	Quantity
1.	Cat's paw retractor	1
2.	Crocodile/ Alligator forceps	1
3.	Small sized Cup forceps: Straight	1
4.	Small sized Cup forceps: Up curved	1
5.	Small sized Cup forceps: Down curved	1
6.	Medium sized Cup forceps: Straight	1
7.	Derlacki's ossicle holding forceps	1
8.	Adson's fine toothed forceps	1
9.	Adson's non toothed forceps	1
10.	Malleus head nipper: down cutting	1
11.	Micro ear scissors: straight	1
12.	Micro ear scissors: up curved	1
13.	Iris scissors	1
14.	Set of round ended slotted ear speculum: 4,5,6,7 mm black colour	1 each
15.	Endaural Jempert speculum	1
16.	Sickle knife for ear	1
17.	Medium sized round knife	1
18.	Medium sized round knife with fenestra	1
19.	Myringotomy knife	1
20.	Double ended knife: Round and flag	1
21.	Farabeuf's periosteal elevator	1
22.	Medium sized Freer's elevator	1
23.	Needle/ Pick: Straight	1
24.	Needle/ Pick: 45 degree	1
25.	Needle/ Pick: 90 degree	1
26.	House curette: medium sized cup	1
27.	Mc Evan's curette with cell seeker	1
28.	Ball probe for ear	1
29.	Aural snare with set of wires	1
30.	Mollison's self retaining mastoid retractor: 3 jaws	1
31.	Plester's Ear canal retractor: Right sided	1
32.	Plester's Ear canal retractor: Left sided	1
33.	Bone nibbler	1
34.	Rosen's Ear canal skin elevator: Small	1
35.	Rosen's Ear canal skin elevator: Medium	1
36.	Adaptor for micro suction cannula	1
37.	Set of Micro suction cannula of various sizes	1
38.	Metallic suction cannula for ear with thumb control: Medium size	1
39.	Metallic suction cannula for ear with thumb control: Large size	1

Dr. Ashish Chandra Agatwal  
MS (ENT), MRCS Ed.  
Additional Professor  
Dept. of ENT  
Dr. R.M.L.I.M.S., Lucknow

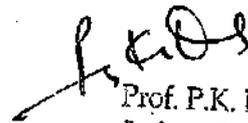
Prof. P.K. Das  
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Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

40.	Stapes foot plate perforator 0.6 mm	1
41.	Stapes piston length measurer	1
42.	Crurotomy scissors: Right	1
43.	Crurotomy scissors: Right	1
44.	Stapes piston	5 pcs
45.	Measuring plate for stapes piston	1
46.	Mayo's scissors	1
47.	50 cc metallic cups	4
48.	Irwin moore forceps	1
49.	Sterilization rack for micro ear instruments	1
50.	Sterilization box with silicone mat for storing ear instruments	2
51.	Cordless headlight with rechargeable battery	1

1.  $\pm 10\%$  variation in size range is acceptable
2. TC inlay should be welded and not pasted.
3. Instruments should be made from high quality surgical grade steel.
4. Instruments should have Laser surface or ebonized or equivalent finish to provide appropriate reflection lowering property.
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Dr. Ashish Chandra Agarwal  
MS (ENT), MRCS Ed.  
Additional Professor  
Dept. of ENT  
Dr. R.M.L.I.M.S., Lucknow



Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

# **Gastro Surgery**

# **Gastro Medicine**



**Resolution Certificate about Technical Specifications  
related to Department of Gastro surgery/Gastro  
Medicine by committee members**

Sr. No.	Name of Equipment	GO number	Approx. Cost
1.	VIDEODUODENOSCOPE	GO-23-Aug-18 Suchi-4	35 - 40 Lacs
2.	NON-INVASIVE MEASUREMENT OF LIVER & SPLENIC STIFFNESS (FIBROSCAN)	GO-7-Dec-2022	1.25 - 1.75 Crore

This is to certify that technical specification of all the above-mentioned machine/instruments, approved by the technical committee is not of any specific company. The technical features of the equipment/instruments from all reputed firms in the current market have been included in this specification to the best of my knowledge and belief & in the opinion of the technical committee.

The technical specification duly signed by the technical committee members is attached herewith.

**Dr. Smita Chauhan**  
Professor (J.G.)  
DR RMLIMS, Lucknow

**Prof. P.K. Das**  
Chairman  
Technical specifications committee  
Clinical Subjects & others  
Head, Department of Anesthesiology & CCM  
DR RMLIMS, Lucknow

**(VIDEODUODENOSCOPE)**  
**SPECIFICATION FOR SIDE VIEWING ENDOSCOPE/DUODENOSCOPE (ERCP SCOPE)**

SI No	Particulars	Remarks
	<ul style="list-style-type: none"> <li>It should have superior image quality with crisp, clear images and true to life colour</li> </ul>	
	<ul style="list-style-type: none"> <li>Scope should have four or more user programmable remote switches to improve operability</li> </ul>	
	<ul style="list-style-type: none"> <li>Should be equipped with special optical image enhancement technology (NBI/BLI/OE i SCAN) for detailed diagnosis of mucosal and pit pattern</li> </ul>	
	<ul style="list-style-type: none"> <li>It should preferably have a locking mechanism for efficient guide wire exchange during ERCP in combination with dedicated v-system ERCP devices</li> </ul>	
	<ul style="list-style-type: none"> <li>It should have slim insertion tube, wide channel diameter and should provide high resolution vision</li> </ul>	
	<ul style="list-style-type: none"> <li>Should have inbuilt scope identification chip for monitor display of scope model no., serial no. Etc</li> </ul>	
	Direction of View	5-degree backward side viewing/oblique
	Distal end outer diameter	14.0 mm or less
	Insertion tube outer diameter	11.5 mm or less
	Channel diameter	4.2 mm or more
	Insertion tube length	1200 mm or more
	Field of view	100 degrees or more
	Depth of Field	5-60 mm or better
	Angulations	Up - 120°, Down - 90°, Right - 100°, Left - 90° or better.
	Minimum visible distance	10mm or closer from distal end
	Working length	L-1240mm. I-1550 or more
	<b>Video Processor &amp; Light Source</b>	
	1. Integrated or separate unit with light source.	
	2. Unit should be compact and light weight	
	3. Light source with 300 watt Xenon / LED Lamp with emergency backup facility.	
	4. Should be equipped with special optical image enhancement technology (NBI/ BLI / OE i scan ) for detailed diagnosis of mucosal and pit pattern	
	5. Air pump inbuilt, air pump minimum two variable airflow control	
	6. Electronic magnification upto 1.5 X by a touch of scope remote switches	
	7. Video output; DVi and HD-SDI output must be available	

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

Dr. Smita Chauhan  
 Additional Professor  
 DNB (Surg.) FIAGES, FALS, FLCS  
 Surgical Gastroenterology  
 Dr. RMLIMS, Lucknow

Monitor : 21" or more high definition of Medical Grade.	
Trolley : Good quality trolley	

<b>Accessories (Preferably from the same company)</b>		
1. Single use Guide Wire	03 Nos	
2. Single use Sphincterotome	03 Nos	
3. Single use Stone Extractor Ballon	03 Nos	
4. Biopsy Valve	10 Pkts	
5. Air water and Suction valves	02 Unit each	
<b>Terms and conditions:</b>		
1. The vendor must give a demonstration of the quoted equipment in the procuring department at their own cost		
2. The system must have a standard comprehensive warranty of 5 years with spares and should quote for paid CMC for the next five years.		
3. A certificate should be given by the supplier that the instrument has not been supplied at a rate lower than the rate quoted in the tender. If it is found to be so, then the afference will be recovered from the supplier along-with panel interest.		
4. It should be certified that if the instrument becomes nonfunctional, it will be repaired within the shortest possible time period and a replacement be provided for the time till the instrument is reinstated for use, otherwise a penal charge will be levied on the company.		
5. The system should meet the approved quality control standards of Government		

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Dr. Smita Chauhan  
 Additional Professor  
 DNB (Surg.) FIAGES, FALS, FLCS  
 Surgical Gastroenterology  
 Dr. RMLIMS, Lucknow

## Non-Invasive measurement of Liver Stiffness and Fatty Liver, Device (Fibro Scan)

### Technical specification

**Description of function:** Device used to measure stiffness or elasticity of hepatic parenchyma and quantification of steatosis with ultrasonic attenuation of liver by completely non-invasive procedure.

1. Device should be able to measure liver stiffness and steatosis simultaneously during one single examination for adult and paediatric populations without any restriction on age and with all kinds of morphology (including obese patients).
2. It should operate on Vibration Controlled Transient Elastography technology with a fixed and controlled shear wave frequency (50Hz)
3. It should be able to measure liver stiffness from minimum 2.0 kPa to 75kPa.
4. 5. It should be able to measure controlled attenuation parameter from minimum 100 dB/m (decibels per meter) to 40000/m.
5. Machine should be able to measure liver stiffness, with quantification of steatosis, for diagnosis of Chronic Liver Disease including Alcoholic or Non-Alcoholic steatohepatitis, Metabolic dysfunction Associated Steatotic Liver Disease (ASH or NASH or MASLD).
6. The System must provide additional diagnostic tools, such as Scores, combining device measured parameters (liver stiffness, CAP) with circulating biomarkers to support management and clinical decisions on patients with CLD
7. Machine must be easily portable for doing all bedside procedures and total weight of the machine with one standard probe must be less than 07 Kg.
8. Device must provide guidance to clearly identify the optimal measurement location in the liver through continuous vibration of the probe.
9. The machine should have facility of measuring Continuous CAP with a minimum of 200 attenuation readings during the examination phase. Both the adult probes (standard and xl) should adapt to different depths depending on patients' morphology
10. Device must be able to switch between a minimum of two connected probes, and provide a live guidance on the probe type for use, depending on patients' morphology

Prof. R. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Dr. Smita Chauhan  
Additional Professor  
DNB (Surg.)-FIAGES, FALS, FLCS  
Surgical Gastroenterology  
Dr. RMLIMS, Lucknow

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11. Device must have automated quality control features to include: probe force indicator, liver stiffness and GAP Indicators, and automated rejection of invalid measurements for Liver stiffness
  12. Device must have the ability to automatically trigger 10 valid Individual measurements based on the quality indicators (probe force indicator, liver stiffness indicator. CAP indicator) through a single click.

**Probe properties and features should be as below:**

**Standard Probe**

Type : For Adults  
Usage : To measure Liver stiffness and steatosis  
Probe frequency : Probe central frequency 3.5 MHz  
Measurement depth : minimum 25 to 70 mm  
Mechanical properties: Dimension-158x52 mm (L x diameter)  
Weight of probe : not more than 500 Grams  
Transducer Diameter : should not be more than 7 mm

**Obese Patient Probe**

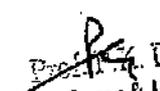
Type : For Obese Patient  
Usage : To measure Hepatic stiffness and steatosis  
Metrological performance : probe transducer central frequency 2.5 MHz  
Measurement depth : minimum 35 to 75 mm  
Mechanical properties : Dimension-158 x 52 mm (L x diameter)  
Weight of probe : not more than 500 Grams  
Transducer Diameter : should not be more than 10 mm

**Display**

- It should have LCD display of not less than 12 inches colour screen.
- Device must display relevant Inter Quartile Range (IQR) / Median liver stiffness ratio (%) and Standard Deviation for CAP measurements so that the exam quality can be easily assessed.

**Power**

- The machine should work on both AC Mains 220V, 50-60Hz and Integral/individual battery powered operation.

  
Prof. P. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Smita Chauhan  
Additional Professor  
DNB (Surg.) FIAGES, FALS, FLCS  
Surgical Gastroenterology  
Dr. RMLIMS, Lucknow

## Connectivity and storage

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- Ethernet connectivity
- 2 or more USB 2.0 ports
- 2 probe connectors
- Device must be able to export data in different formats (PDF, XLXS) and must have sufficient storage capacity to save a minimum of 25,000 examination records on the device archive.

## Miscellaneous

- Device must have optional facility to connect paediatric patient probe.
- Acceptable downtime of equipment should not be more than 48 hours.
- Auto software updation till life of equipment.
- Probe calibration needs to be included as part of warranty & till CAMC.
- UPS along with power backup to be provided with machine, and its warranty and CAMC should be covered as per machine warranty and CAMC
- Colour printer (laserjet) to be part of machine.
- Branded Computer to be a part of machine (with minimum i7, 16 GB RAM, 500 GB min Hard disk)
- Device should be quoted and supplied with 5 years warranty and thereafter 5 years CMC including UPS & other accessories.

## Certification

Device should be European CE/USFDA certified and valid certificate must be attached with bid document. It should be Class IIa certified as per Medical Device directive 93/42/EC

## Scope of supply

- Fibroscan machine-1
- Standard probe-1
- XI probe-1
- Display monitor (if not included in machine)-1
- Branded Computer 17, 8 GB RAM, 500 GB storage
- Colour Laser Jet Printer/ink Jet
- UPS with 30 minutes back up
- Ultrasound Jelly 250 ml-50 piece

It is certified that the specifications of the Fibro Scan are of general nature/ broad parameter and do not favour a particular company

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Dr. Anita Chauhan  
Additional Professor  
DNB (Surg.) FIAGES, FALS, FLCS  
Surgical Gastroenterology  
Dr. RMLIMS, Lucknow

# General Items

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**Declaration Certificate about Technical Specifications  
related to General Items by committee members**

SR. NO.	NAME OF EQUIPMENT	GO NUMBER	APPROX. COST
1.	HOSPITAL CRITICAL AREA INDOOR ENVIRONMENT DECONTAMINATION SYSTEM	GO-23-AUG-18 SUCHI-4	35 - 40 Lacs
2.	CRASH CART	GO-28-JAN-18 SUCHI-2	75,000/-
3.	INSTRUMENT TROLLEY	GO-28-JAN-18 SUCHI-2	25,000/-
4.	PEDESTAL OT LIGHT	GO-7-DEC-2022	1.25 Lacs
5.	PULSE OXIMETER	GO-7-DEC-2022 GO-28-JAN-18 SUCHI-2	50,000/-
6.	HI VAC PLUS 90 LTR.	GO-23-AUG-18 SUCHI-4	1.5 Lacs
	HI VAC PLUS 60 LTR.	GO-28-DEC-17 SUCHI-1 GO-23-AUG-18 SUCHI-4 GO-7-DEC-2022 GO-7-DEC-2022 GO-7-DEC-2022	60,000/-
7.	ADVANCED OT LIGHT	GO-28-JAN-18 SUCHI-2	2.5 Lacs
	BASIC OT LIGHT		1.25 Lacs
8.	ELECTRONIC ADULT WEIGHING SCALES (PORTABLE)	GO-7-DEC-2022	5,000/-
9.	Basic BP Instrument	GO-23-AUG-18 SUCHI-4	20,000
	Advanced BP Instrument	GO-7-DEC-2022	3.5 Lacs

This is to certify that technical specification of all the above-mentioned machine/instruments, approved by the technical committee is not of any specific company. The technical features of the equipment/instruments from all reputed firms in the current market have been included in this specification to the best of my knowledge and belief & in the opinion of the technical committee.

The technical specification duly signed by the technical committee members is attached herewith.

Prof. P.K. Das

Chairman

Technical specifications committee

Clinical Subjects & others

Head, Department of Anesthesiology & CCM

DR RMLIMS, Lucknow

### Hospital Critical Area Indoor Environment Decontamination System

1. The unit should be suitable for hospital critical area indoor environment decontamination
2. The manufacturer should have study to prove that the unit is useful & can be used in/for neutropenic / Immune-suppressed / infectious disease patient care areas.
3. The unit should use nonthermal-plasma reactors to reduce/lower the airborne bioburden.
4. The unit should be able to provide log 2 reductions of airborne particles fast within 30 minutes of its operational time in a critical care area. Should have supportive documents to prove the same.
5. The unit should not require any form of gases, any chemical product consumption and any light wavelength to reduce airborne bioburden for operators/patient safety and ease of operation
6. The unit should be efficient against mycobacterium, aspergillus and viral aerosols with evidence. A third-party test should be provided to prove the same.
7. The device should have an independent stage of the processing system to remove VOC (Volatile organic compounds) and gases.
8. The system should be configured to work as negative and positive pressure types whenever required.
9. The unit should be equipped with a prefilter with the capacity to filter up to 10 microns of particles. Supportive documents for the same should be provided.
10. The unit should be designed to be used continuously, in the presence of patients.
11. The device should not require weekly cleaning procedure to avoid human error and for ease of use.
12. The unit should have a minimum airflow speed of 1100 m3/hr. A supportive document should be provided to prove the machine's running speed.
13. The machine should not release /emit ozone to ensure patient and staff safety.
14. The machine should provide minimum 8 air changes per hour in a room with a volume 4000 cubic feet and an ACPH calculation sheet should be provided in support of the same.
15. Should have an LCD touch screen to select and monitor operating parameters including Air flow speed, Day/Night Mode, unit performance & malfunctioning errors.
16. The unit should have a USB port to access and transfer unit performance data and records.

  
Prof. P.K. Das

Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

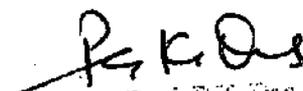
17. The machine should have an inbuilt barcode reader to record bio-decontamination reactors' usage patterns.
18. The noise level should be less than 50 db (A) even at a maximum airflow speed of 1200 m<sup>3</sup>/hr from 2 meters distance.
19. It should have inbuilt sturdy wheels for ease of mobility.
20. The Machine should have a height of 3 – 5 feet for better air circulation.
21. Should have an indicator for malfunctioning the unit.
22. The unit should meet international quality and safety norms and should be European CE / US FDA approved



Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

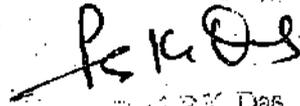
## CRASH CART

MULTYPURPOSE DELUXE CRASH CART	
1	Overall Size: 1900 mm L x 580 mm WX 1750 mm H.
2	The crash cart should have 25.4 mm x 1.2 mm (18G) Mild steel tubular frame work.
3	The emergency equipment cart should have the following facilities : Two rows of covered PVC Boxes with 5 boxes in top row and 4 boxes in lower row.
4	Six lockable drawer's units made of CRCA Sheet with upper 2 drawers containing three sizes of medical partitions. The other four drawers should be of varying dimensions. The three drawer each to hold emergency medicines, ambu bags, IV solutions, catheters, etc. separately.
5	Facility to carry monitors, ECG, suction apparatus on top of the cart.
6	Stainless steel saline rod made of 12 mm dia. 304 grade S.S. approx. 750 mm long and bent at top to have an arm of 400 mm approx. at the end of which of 6 mm dia. S.S. hook shall be welded with TIG process.
7	Crash cart with 125 mm dia non-rusting castor two with brakes and two without. Castor made from high grade non-floor-staining synthetic materials with integrated thread guards.
8	Wheel centre having precision ball bearing to run smoothly.
9	Provided with round rubber buffer, one on each corner.
10	The top shelf should be provided with railing on three sides. This railing is made from SS
11	304 Rod of diameter 10 mm.
12	Pull out cardiac massage board made of MDF of minimum size 670 mm x 330 mm x 12 mm laminated on top and bottom of laminate of mm and 0.6 mm respectively. MDF shall have water resistance property and it should be made from eco-friendly material.
13	Oxygen cylinder cage epoxy powder coated, on one side.
14	Handle for pushing the crash cart is made from SS 304 tube size 22 mm x 1.2 mm (18 G) and SS flat size 25 mm x 5 mm thick, provided on other side.
15	All stainless steel wherever used should be 304 grades. S.S parts finished with Matt Polish.
16	All mild steel components should be thoroughly in- house pre- treated chemically to remove rust, grease, oil, etc. by 7 tank dip & drain processes, including separate degreasing ,de-rusting phosphating each followed by water rinsing activating & passivating and hot air drying to give phosphate coating. The side inspection report is mandatory during the evaluation period.
17	The treated metal surface should then be coated in-house with epoxy polyester powder with paint dry- film thickness of 60 microns (minimum) and oven baked at 180 deg. To 200 deg. Centigrade. All Stainless Steel used should be of 304 grades.
18	Finishing & workmanship in the medical furniture is of prime importance and must be of high standard. All corners shall be rounded off so that there shall be no sharp corners and holes should be burr free.
19	All Process Parameters as per documented IMS Procedures for Quality Assurance ISO 9001:2015, ISO 14001:2015, OHSAS 18001:2007 & ISO 13485:2003, ANSI-BIFMA, European CE

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**Instrument Trolley**

Sr. No.	Technical Specifications
1	Overall approximate size: 680 mm L x 450 mm W x 900 mm H.
2	Stainless steel (304 Grade) Tubular frame mounted on four 125 mm diameter castors with synthetic body, two with brake & two without brake.
3	Two stainless steel shelves (304 Grade) with Protective railing on three sides.
4	The product is ISO 13485:2016, ISO 9001:2015, ISO 14001:2015, ISO 45001:2018, OHSAS 18001:2007 & European CE (from notified body) certified.



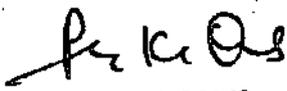
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**PEDESTAL OT LIGHT**

- 1. Technology of Light Emission of OT Light:**  
LED Technology
- 2. Material of Head Lamp:**  
ABS
- 3. Range of Light Intensity in Luminous At 1 Meter Distance With Tolerance  $\pm$  5000:**  
160000
- 4. Range of Colour Temperature in Kelvin:**  
3700-4300
- 5. Life Span of LED in Hours:**  
40000 or above
- 6. Range of Illuminated Field Diameter in Mm:**  
200-400 or better
- 7. Colour Rendering Index (CRI):**  
95 or better
- 8. Type of Control Panel:**  
Manual and Touch Screen
- 9. Range Of Depth of Illumination of OT Light in Cms:**  
60 - 125 or better
- 10. Type of Lamp Head:**  
Single non-winged round shape lamp head for easy maintenance and better sealing against dust and fumigation
- 11. Diameter of Lamp Head in Mm with Tolerance Of  $\pm$ 20 Mm:**  
500 or above

**Certifications:**

1. All items should be USFDA approved / European CE certified from a notified body.



Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCIM  
Dr. RMLIMS, Lucknow

## Pulse Oximeter

Type of Pulse Oximeter : TABLE TOP

\* Special Signal processing Technology (Motion artifact rejection) : Any Value

SPO2 probes : Reusable

+Display of SPO2 and PR : Digital Display With Plethysmograph With Trends

Type of Patient :

Neonatal

Pediatric

Should be shock proof : True

Display (with contrast adjust-ability) : LCD

Display should be Readable from at least 3 feet : True

Saturation displayed on the screen : True

Pulse Rate displayed on the screen : True

Perfusion Index displayed on the screen : True

Status of battery charging displayed on the screen : True

Sensor off : On status : True

@Audible and visual Alarms : True

Alarm override facility should be present : True

Trends : 72 Hrs

Type of trend display : Graphical

Power source : Inbuilt Re-Chargeable Battery And Mains 220-240 V , 50 Hz AC Operation

SAutomatic switch from mains to battery in case of power failure : Yes

RS 232C interface for data communication and transfer : Yes

Should have provisions for wireless and blue tooth connectivity : Yes

Protective splash proof case for clean and storage and safe transport provided : True

Length of power cable : Any Value

Type of probe :

\*Neonatal

Pediatric

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

Probe usage : Reusable

Number of probes provided (Hint: in case adult , pediatric and neonatal are selected for type of probe all the three have to be given and in case adult & pediatric are selected both are to be given) : 1 Each

Non invasive blood pressure (NIBP) provided : Any Value

Type of BP monitoring : NA (If NIBP Not Provided)

NIBP range in mmHg : NA (If NIBP Not Provided)

Cuff size : NA (If NIBP Not Provided)

Number of cuffs provided: NA (If NIBP Not Provided)

Warranty in years (without probes): As per Institute norms.

Warranty for probes in years: 1

Patient extension cable: Yes

Additional requirements:-

\*Special Signal processing Technology (Motion artifact rejection): It should take care of low perfusion states.

+Display of SPO2 and PR : Heart rate 40-250 Per minute and SPO2 0-100% (Resolution 1% , accuracy  $\pm 3\%$ )

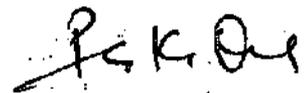
@Audible and visual Alarms:- Volume adjustable

\$Automatic switch from mains to battery in case of power failure:- Battery backup minimum 3 hrs.

Type of probe :

\*Neonatal (It should be accurate of neonate of 500 Gm to 4500 Gm, safe and not to cause burn and preferably wrap around.

Certification : ISO 9001 & ISO 13485



Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**HI VAC PLUS 90 Ltr.****TECHNICAL FEATURES:**

Housing	Plastic moulded on four wheels with foot switch & changeover lever
Max. Vacuum / LPM	700 mm Hg, 90 Ltrs / min
Pump Type	Double Piston pump
Jars	2 x 2.5 Ltrs. PC Jar
Filter	Bacterial Filter Autoclavable / Reusable
Tubing	10 mm ID x 2 mtr. (PVC)
Vacuum Gauge	6.25 cm dia 0-760 mm Hg
Power Supply	220 V AC, 50 / 60 Hz, 360 Watt
Noise Level	55 dB A $\pm$ 3
Dimensions	46 x 34 x 86 cms
Net Weight	20.5 Kg
Overflow Safety	Mechanical & Electronic Sensor
Optional	4 Ltr. Polysulfone (PSU) Jars 5 Ltr Polycarbonate Jar / 110V
LPM	90 ltr per min
Certifications	CE, 60601-1-2012

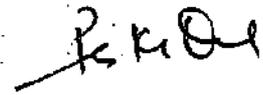
*P.K. Das*

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## HI VAC PLUS 60 Ltr.

## TECHNICAL FEATURES:

Housing	Plastic moulded on four wheels with foot switch & changeover lever
Max. Vacuum / LPM	600 mm Hg, 60 Ltrs / min
Pump Type	Single Piston pump
Jars	2 x 2.5 Ltrs. PC Jar
Filter	Bacterial Filter Autoclavable / Reusable
Tubing	10 mm ID x 2 mtr. (PVC)
Vacuum Gauge	6.25 cm dia 0-760 mm Hg
Power Supply	220 V AC, 50 / 60 Hz, 200 Watt
Noise Level	55 dB A $\pm$ 3
Dimensions	46 x 34 x 86 cms
Net Weight	17Kg
Overflow Safety	Mechanical & Electronic Sensor
Optional	4 Ltr. Polysulfone (PSU) Jars 5 L tr Polycarbonate Jar / 110V
LPM	60 ltr per min
Certifications	CE, IEC60601-1-2012



Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Advanced OT Light

Light should have two domes each with 160,000 lux at maximum illumination.

Each dome should have 360 degree lock-free rotation at all joints across the vertical axis. (Swivel arm to central axis, spring arm to swivel arm, yoke to swivel arm). There should be 360 degree rotation even for dome with camera.

Spring arm system provided with domes should have at least approx 40 degree up and 40 degree down motion for easy of positioning.

Dome base should be made out of single Aluminum body and should have a diameter of approx 600 mm or bigger.

Each dome should have touchscreen controller for controlling various parameters such as intensity, colour temperature, focus control and camera control (for future if needed). Light should be supplied with additional wall mount controller with 7 inch touchscreen for controlling either of the domes for non-sterile area control.

Each dome should have minimum 20 leds to ensure excellent shadow compliance, each light-head should be equipped with at least 4 sensors to detect object and boost illumination. User should be able to switch the shadow sensor On and Off as per his preference from the controller on the dome.

LEDs should have a life of 60000 hours and hour-meter should be in-built provided on every dome controller.

OT Light should have excellent flicker free illumination.

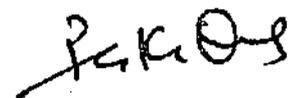
Each dome should have high CRI with  $R_a > 96$ ,  $R_9 > 96$  and  $R_{13} > 96$  without using separate independent red leds.

Each dome should have adjustable focus and adjustable color temperature, all parameters should be controllable through touch control on light or on wall mount.

There should be an option of sync mode that can be activated through wall controller to enable all domes to be able to control through any of the dome controller.

### Certifications:

- OT Light Manufacturer should have ISO 13485 and ISO 9001 certification via IAF accredited body.
- OT Light should have European CE (DOC with EU Representative document) and USFDA registration related documents.
- OT light should have IEC test reports IEC 60601-1-1, IEC 60601-1-2, IEC 60601-2-41.



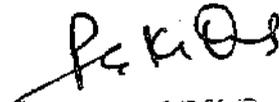
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

### Basic OT Light

- Light should be a mobile examination light with intensity of 50,000 lux at 1 meter
- Should have wheels to ensure easy movement.
- Should have high CRI illumination (Ra – min 90)
- Should have stable illumination over long duration.
- Should have excellent flicker free illumination.
- Should have on / off switch to start – stop the light, and knob for intensity control.
- Should have a light-field diameter (d10) of at least 200 mm or bigger at 1 meter.
- Should have dome mounted on spring loaded arm.

#### Certifications:

- Manufacturer should have ISO 13485 and ISO 9001 certification via IAF accredited body.
- Manufacturer and products should have Indian CDSCO & European CE, should also be registered with USFDA. Relevant documents and website links to showcase registered devices on the website of these regulatory authorities must be provided.



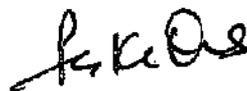
Prof. P.K. Das  
Professor & Head  
Dept. of Anesthesiology & CCM  
Dr. RMLIMS, Lucknow

## ELECTRONIC ADULT WEIGHING SCALES (PORTABLE)

1. Capacity: 160 kg, Accuracy 100 g.
2. Platform size 350 x 350 mm (Tolerance +/-10%)
3. Display should be LCD with four digits. Size of display should be of minimum height 24 mm for clear visibility.
4. Should be made up of sturdy mechanical structure to support/ to withstand heavy work load in public health center.
5. The Scale should operate on dry cell batteries and the batteries should sustain up to minimum of six months. The inbuilt batteries should be supplied with the scale.
6. The reading should get locked automatically at stable weight and there should be an indication of Stable weight.
7. The scale should have facility for kg/lb conversion and there should be indication for kg/lb.
8. It should have Battery low indication.
9. The scale should have AUTO-OFF feature for reducing the power consumption and to extend the battery backup period.
10. The Scale should be as per BIS specifications. The scale should have ISI mark.

**Certifications:**

1. All accessories should be from the same Original Equipment Manufacturer for the main unit.
2. Instruments must be ISO certified and a copy should be enclosed. (The ISO Certificate must be issued by any organization accredited by the Bureau of Indian Standard or accredited by the international accrediting forum "IAF" (Certificate to be attached).
3. Other necessary certifications if any required will be provided by the bidder for the smooth functioning of the machine.



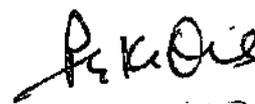
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## AUTOMATED BP INSTRUMENT

1. Should be able to measure blood pressure and pulse rate in adult as well as pediatric patients.
2. Should be based on oscillometric measurement technology, using the dynamic linear deflation method.
3. Should have backlight LCD display with easy-to-view readings in dim light.
4. Pressure measurement range should be 60 to 250 mm Hg systolic, and 40 to 200mm Hg diastolic.
5. Pressure display accuracy of +/- 3 to 5 mm Hg
6. Pulse rate measurement range of 40 to 200 per minute
7. Pulse measurement accuracy of within 5%
8. Should include AC adapter (input range 100-240V and output voltage DC 6V), preferably with rechargeable battery (3.6V to 4.8V, 1900 to 2400mAh)
9. Should be supplied with standard adult size cuff (22 to 32 cm size)
10. Single button operation for start and stop functions with auto-inflation of blood pressure cuff.

## Certifications:

1. Instruments must be ISO certified and a copy should be enclosed. (The ISO Certificate must be issued by any organization accredited by the Bureau of Indian Standard or accredited by the international accrediting forum "IAF" (Certificate to be attached).
2. Should be USA FDA / European CE be approved by 4 digits notified body.



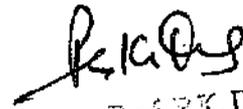
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**Basic BP Instrument**

- Should have Selectable deflation speed (2.5 mmHg /sec. or 5.0 mmHg / sec.) and quick start for auscultatory mode
- Should have Dual measurement mode (Auscultatory and Oscillometric)
- Should have Cuff holder and grip for carrying
- Should have Durable and chemical resistant body
- Should have Professional cuff and 5 cuff sizes should be available for use
- Should have more than 3" LCD display with backlight
- Should have Rechargeable battery (approx 300 measurements at full charged)
- Should have Adjustable inflation pressure (AUTO/220/250/280)
- Should have Irregular heartbeat (IHB) indicator
- Should have memory storage of last 99 measurements

**Certification:**

Should must be a USFDA/CE/BIS Certified



Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Advanced BP Instrument

Accurate measurement with sophisticated automatic cuff size adjustment mechanism
Easy operation
Should have Antibacterial arm cuff cover
Should Pick any arm
One button operation
Measurement method: Oscillometric
Pressure Display range: 0 to 299 mmHg
NIBP measurement range SYS 50-250mmHg, DIA 20-200mmHg, Pulse 30-200mmHg
Measurement Accuracy Pressure: $\pm 3$ mmHg ; Pulse: $\pm 5\%$
Cuff fastening method: Torque Controlled Belt Drive Method (TCBM)
Display Type: LED Display
Cuff Pressure: Automatic Inflation by Air Pump
Cuff Size: 125 x 300 mm
Clock function: Should display Date & Time
Printer: Thermal printer with Auto cutter in monitor
Measurement By Both Arms
Safety device (Electrical): Quick release when START/STOP button is pressed
Pressure detection method Capacitance type pressure transducer
Applied pressure Automatic Inflation by Air Pump
Power: 100-240V
Certificate: USFDA/ European CE / BIS

### Scope of supply:

- BP Machine - 01
- UPS - 01
- Stand for mounting machine - 01
- Thermal printer - 01
- Thermal roll - 05

*P.K. Das*

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

# Gynecology



**Statement about Technical Specifications  
related to Department of Gynaecology by committee  
members**

SR. NO.	NAME OF EQUIPMENT	GO NUMBER	APPROX. COST
1.	AYERS SPATULA	GO-23-AUG-18 SUCHI-4	500/- TO 1,000/-
2.	ALL SURGICAL INSTRUMENT	GO-28-DEC-17 SUCHI-1 GO-28-JAN-18 SUCHI-2 GO-1/112605/2021 GO-28-Jan-18 Suchi-2 GO-28-Jan-18 Suchi-2 GO-28-Jan-18 Suchi-2 GO-06-Mar-18 Suchi-3 GO-06-Mar-18 Suchi-3	2,00,000
3.	OPERATIVE LAPAROSCOPIC SET	GO-23-AUG-18 SUCHI-4	50,00,000
4.	CAESAREAN KIT SET	GO-28-JAN-18 SUCHI-2 GO-06-Mar-18 Suchi-3 GO-23-Aug-18 Suchi-4	30,000
5.	CAUTERY MACHINE (HIGH END SURGICAL ELECTRO-CAUTERY WITH VESSEL SEALER)	GO-28-Jan-18 Suchi-2	2,00,000
6.	CRYO SURGICAL SYSTEM		
7.	CX BIOPSY SET	GO-06-MAR-18 SUCHI-3 GO-28-JAN-18 SUCHI-2 GO-28-JAN-18 SUCHI-2	20,000 10,000
8.	EA & ECC SET	GO-06-MAR-18 SUCHI-3 GO-23-AUG-18 SUCHI-4	11,000
9.	D&C AND MTP SET	GO-28-JAN-18 SUCHI-2 GO-28-JAN-18 SUCHI-2 GO-06-Mar-18 Suchi-3	10,000
10.	HYSTEROSCOPE SET	GO-06-MAR-18 SUCHI-3	40,00,000
11.	IUCD INSERTION SET	GO-28-JAN-18 SUCHI-2 GO-23-AUG-18 SUCHI-4	6,000
12.	HYSTEROSCOPY SET	GO-28-JAN-18 SUCHI-2 GO-28-JAN-18 SUCHI-2	5,00,000-15,00,000
13.	IUCD REMOVAL SET	GO-28-JAN-18 SUCHI-2	4,000
14.	FETAL MONITOR	GO-28-JAN-18 SUCHI-2 GO-28-JAN-18 SUCHI-2 GO-28-JAN-18 SUCHI-2 GO-23-AUG-18 SUCHI-4	1,50,000
15.	NORMAL DELIVERY SET	GO-06-MAR-18 SUCHI-3 GO-23-AUG-18 SUCHI-4	20,000
16.	PEDESTAL OT LIGHT	GO-28-DEC-17 SUCHI-1	50,000
17.	USG FETAL DOPPLER MACHINE	GO-28-JAN-18 SUCHI-2 GO-7-DEC-2022	1,35,000
18.	DIGITAL VIDEO COLPOSCOPE	GO-28-JAN-18 SUCHI-2 GO-23-AUG-18 SUCHI-4	5,00,000
19.	VACUUM EXTRACTOR WITH CUPS	GO-06-Mar-18 Suchi-3	35,000
20.	VAGINAL HYSTERECTOMY SET/VAGINAL REPAIR SET	GO-28-JAN-18 SUCHI-2 GO-28-JAN-18 SUCHI-2 GO-06-MAR-18 SUCHI-3 GO-06-MAR-18 SUCHI-3	55,000
21.	OPERATIVE LAPAROSCOPY SET	GO-23-AUG-18 SUCHI-4	70,00,000
22.	GYNACEOLOGY EXAMINATION TABLE	GO-23-AUG-18 SUCHI-4 GO-23-AUG-18 SUCHI-4	1,00,000 - 5,00,000 1.5 lac

*Signature*  
Dr. SHALY AGARWAL  
Professor  
Dept. of Obst. & Gynaecology  
G.S.M.H. Medical College  
Kanpur

*Signature*  
Dr. Devyani Misra  
Professor Junior Grade  
Department of OBGYN  
RPGMCSRH, Dr. RMLIMS

*Signature*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology &  
Dr. RMLIMS, Lucknow

*Signature*  
Head of The Dept.  
Gynaecological Oncology  
M.G. Medical University  
Uttar Pradesh, Lucknow



... .. estimate about Technical Specifications  
related to Department of Gynaecology by committee  
members

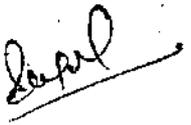
23.	CRYOTHERAPY UNIT	GO-7-Dec-2022	
24.	MR SYRINGE	GO-06-MAR-18 SUCHI-3	2.5 - 4 lakhs
25.	NST MACHINE	GO-23-AUG-18 SUCHI-4	2000 - 5000
26.	VAGINAL DELIVERY SET	GO-7-DEC-2022	80,000-1,50,000
		GO-23-AUG-18 SUCHI-4	20,000 - 25,000 per set
27.	VAGINAL EXAMINATION SET	GO-23-Aug-18 Suchi-4	3,000 - 5,000
28.	GLUCOMETER	GO-23-AUG-18 SUCHI-4	2,000/- TO 2,500/-
	GLUCOSE STRIPS		1,000/- to 1,500/-
29.	HEAD LAMP	GO-23-AUG-18 SUCHI-4	1,50,000/- TO 2,00,000/-
30.	HIGH DEFINITION LCD MONITOR	GO-23-AUG-18 SUCHI-4	2,00,000/- TO 3,00,000/-
31.	LABOUR TABLE	GO-23-AUG-18 SUCHI-4	1,50,000/- TO 2,00,000/-
32.	LARYNGOSCOPE	GO-7-DEC-2022	60,000/- TO 80,000/-
33.	STERILIZER	GO-23-AUG-18 SUCHI-4	6,00,000/- TO 8,00,000/-
		GO-23-AUG-18 SUCHI-4	3000 - 5000/-
34.	HYSTEOSALPHINGOGRAM CANNULA	GO-23-Aug-18 Suchi-4	

This is to certify that technical specification of all the above-mentioned machine/instruments, approved by the technical committee is not of any specific company. The technical features of the equipment/instruments from all reputed firms in the current market have been included in this specification to the best of my knowledge and belief & in the opinion of the technical committee.

The technical specification duly signed by the technical committee members is attached herewith.

  
Dr. Nisha Singh  
Professor  
KGMU, Lucknow  
Head of the Deptt.  
of Gynaecological Oncology  
K.G. Medical University  
Uttar Pradesh, Lucknow

  
Dr. Devyani Misra  
Professor (J.G.)  
DR RMLIMS, Lucknow

  
Dr. Shaily Agarwal  
Professor  
Medical College, Kanpur

Dr. SHAILY AGARWAL  
Professor  
Dept. of Obs. & Gynaec.  
K.G. Medical University  
Lucknow

  
Prof. P.K. Das  
Chairman  
Technical specifications committee  
Clinical Subjects & others  
Head, Department of Anesthesiology & CCM  
DR RMLIMS, Lucknow

# AYERS SPATULA

## TECHNICAL SPECIFICATION:

- Should be wooden in material.
- Should be of 6 inches in length
- Should be of 2mm in thickness.
- One side U shaped opening and a flat round shape on other.
- Should be sterile packed in a soft wrap.

*[Handwritten Signature]*

DR. SHABU ANANDHARAJU  
Professor  
Dept. of Obst. & Gynaecy  
G.S.V.M. Medical College  
Tirupur

*[Handwritten Signature]*

Head of The Deptt.  
Of Gynaecological Oncology  
K.G. Medical University  
Uttar Pradesh, Lucknow

*[Handwritten Signature]*

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

*[Handwritten Signature]*

Dr. Devyani Mishra  
Professor Junior Grade  
Department of OBGYN  
RPGMCSRH; Dr. RMLIMS

## All Surgical Instruments

Specification for Abdominal Surgery set (Basic) (Hystarectomy Set)		
Sl. no	Instruments (per set)	Quantity (per set)
1.	Swab forceps smooth, FOERSTER, straight, 25cm	2
2.	Needle holder, MAYO-HEGAR Serrated, TC jaws, 20 cm	1
3.	Needle holder, MAYO-HEGAR Serrated, TC jaws, 16 cm	1
4.	Haemostat Forceps, SPENCER WELLS, straight, 15 cm.	4
5.	Haemostat Forceps, SPENCER WELLS, Curved, 15 cm	4
6.	Tissue forceps atraumatic, ALLIS 16 cm	4
7.	Tissue forceps atraumatic, ALLIS 20 cm	4
8.	Towel Forceps, BACKHAUS 13 cm	6
9.	Scalpel handle no -4, 16.5 cm	1
10.	Scalpel handle no-3, 12.5 cm	1
11.	Forceps atraumatic De BAKEY straight, 2.0mm, 16 cm	1
12.	Tooth forceps, WAUGH, 20 cm, 1x2 tooth	1
13.	Dissecting Scissors, METZENBAUM curved, TC, 18.0 cm	2
14.	SS suction tip, curved, 2 mm, 25 cm	1
15.	Heneay's clamp Straight 8"	2
16.	Heneay's clamp Curved 8"	4
17.	Autoclavable Instrument box with cover	1
18.	Sterilizing forceps, CHEATLE 27 cm	2
19.	Suture cutting scissor 6"	1
20.	Tissue cutting scissor curved (Mayo) 6"	1
21.	Deaver's retractor large	1
22.	Deaver's retractor medium	1
23.	Richardson retractor for bladder	1
24.	Morris retractor	2
25.	Kidney Tray 8"	2
26.	Bowl Medium	2
27.	Czerny retractor 38x22 cm	2

## Certifications

Quality certificate  
CE /BIS/ ISO

*Shaili*  
Dr. SHAILI AGARWAL  
Professor  
Dept. of Obs. & Gynaec.  
G.S.V.M. Medical College  
Bareilly

*Dewyani*  
Dr. Dewyani Misra  
Professor Junior Grade  
Department of OBGYN  
RPGMCSRH, Dr. RMLIMS

*P.K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCU  
Dr. RMLIMS, Lucknow

*H*  
Head of The Deptt.  
Of Gynaecological Oncology  
K.G. Medical University  
Lucknow, Uttar Pradesh, Lucknow

## Operative Laparoscopy Set- Basic

S. No.	Technical Specification	Qty.
1	Veress Needle: Veress Needle with spring loaded blunt stylet with luer lock and length of 100 - 120 mm	1
2	Veress Needle: Veress Needle with spring loaded blunt stylet with luer lock and length of 130 - 150 mm	1
3	Telescope: - 10 mm 30 degree scope with working length of at least 270 mm telescope.	1
	Fiber optic light transmission incorporated, should be compatible with the light cables Can be sterilized by autoclaving or standard sterilization methods.	
4	Trocar, with Pyramidal Tip with cannula flap valve for 10 mm port For 5mm port	2
5	Reducer 10mm-5mm	4
		1
A.	<b>4K Camera Head</b>	1
i.	Must have a resolution of 3840*2160 pixels and progressive scan to guarantee genuine 4k (UHD) picture	1
ii.	CMOS with progressive scan	1
iii.	Must be compatible with all standard Telescopes	
B	<b>True 4k Ultra-High-Definition (UHD) Monitor</b>	
i.	Medical Grade Monitor	1
ii.	Minimum size of 32"	
iii.	Must have effective resolution of 3840*2140 pixel to display pure 4k images	
C	<b>Documentation and Archiving System</b>	
i.	State of the art user friendly medical grade system (certified to be used in OT) should be offered.	1
ii.	User should have full control of the system from the sterile field via camera head buttons	
D	<b>Light Source</b>	
i.	High Intensity (6000K) LED Light Source	1
ii.	Light hours > 40,000	
E	<b>Fiber optic light cable</b>	
i.	Length should be 2300mm with Diameter 4.8mm.	1
ii.	Should be highly flexible and autoclavable.	
F	<b>Co2 Endoflator</b>	1

*Sept*  
**Dr. Shaily Agarwal**  
 Professor  
 Dept. of Obs. & Gynaecology  
 G.S.V.M. Medical College  
 Kanpur

*Daini*  
**Dr. Devyani Misra**  
 Professor Junior Grade  
 Department of OBGYN  
 RPGMCSRH, Dr. RMLIMS

*P.K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & Critical Care  
 Dr. RMLIMS, Lucknow  
**Head of The Dept.**  
**K.G. Medical University**  
 Uttar Pradesh, Lucknow

i.	Should be full automatic electronic insufflator	1
ii.	Flow rate at least 30 Liters/ min or more (lower capacity will not be acceptable)	1
	Must have digital display for all preset and real time values.	1
iv.	Must have automatic alarm and pressure control systems in case of over pressure.	
v.	High pressure hose suitable for connecting endoflator with pin indexed CO2 cylinder	
vi.	Wrench kit suitable for connecting endoflator with pin indexed CO2 cylinder	
vii.	CO2 bottle of at least 10-kg capacity	1
<b>G</b>	<b>Suction / Irrigation Pump</b>	
i.	Must be microprocessor control.	
ii.	Touch screen interface.	
iii.	Rate of flow up to 100ml/min.	
iv.	Pressure of irrigation to be maintained up to 500mm Hg for laparoscopy software.	
v.	Suction up to 5 bar.	
<b>H</b>	<b>Mobile Video Cart</b>	1
i.	Must be from the same manufacturer (local alternates not acceptable).	
ii.	Must have minimum 2-3 shelves and drawer.	
iii.	Must have Monitor Arm which can be swivelled in all directions.	
iv.	Must have ergonomic design and concealed cable conduits	
<b>I</b>	<b>Essentials</b>	
i.	Mains Cord	
ii.	Operations Manual	
iii.	Service Manuals	
iv.	Formalin Chamber (for sterilizations of laparoscopy instruments)	1
<b>J</b>	<b>Hand Instruments.</b>	
	a) All forceps must be 5mm in Diameter and have a Length of 35cms (plus-minus 2 cms) unless otherwise mentioned.	
	All forceps must be completely dismantlable into 3 parts for easy cleaning and disinfection.	
1	Standardjaw Maryland dissector.	1
2	2x4 tooth Grasping forceps.	1
3	Matzenbaumcurved scissors.	1
4	Bipolar Forceps, 5mm, 36 cms	1
5	Bipolar Connecting Cable	1
6	L-Hook, 5mm, 36 cms	2
		1

*Sapna*  
 Dr. NEELI AGARWAL  
 Professor  
 Dept. of Obs. & Gynaecology  
 G.B.P.H. Medical College  
 Lucknow

*Devi*  
 Dr. Devyani Misra  
 Professor Junior Grade  
 Department of OBGYN  
 RPGMCSRH, Dr. RMLIMS

*P.K.*  
 Head of The Deptt.  
 of Gynaecological Oncology  
 G.B.P.H. Medical University  
 Lucknow  
 Prof. P.K. Gupta  
 Professor & Head  
 Dept. of Anaesthesiology & CCU  
 Dr. RMLIMS, Lucknow

8	Unipolareconnectingcable	
9	.5mmSuction Irrigation cannula with tube.	2
10	NeedleHolder, 5mm, 36 cms. Jaws curved left.	1
		1

### Certifications

Quality certificate  
USFDA or CE

Electrical Certification  
IEC 60601

*Sharma*  
Dr. SHARMA ADARSH  
Professor  
Dept. of Obs. & Gynaecology  
G.S. V.M. Medical College  
Lucknow

*Misra*  
Dr. Devyani Misra  
Professor Junior Grade  
Department of OBGYN  
RPGMCSRH, Dr. RMLIMS

*P.K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

*Das*  
Head of The Deptt.  
Of Gynaecological Oncology  
K.G. Medical University  
Uttar Pradesh, Lucknow

## Caesarean Kit Set

S.No.	NAME OF INSTRUMENT	Quantity
1.	Tray Large with lid	1
2.	Sponge Holder 8"	2
3.	Towel Clip	4
4.	B.P. Knife Handle	2
5.	Toothed Forceps 8"	1
6.	Non toothed Forceps	1
7.	Artery Forceps Straight 6"	4
8.	Artery Forceps CVD 6"	4
9.	Allis Forceps 8"	4
10.	Lane's Tissue Forceps	2
11.	Moynihans Tetra Clamp	2
12.	Green Armytage	2
13.	Kocher's Cord Clamp straight 8"	2
14.	Morris Retractor	2
15.	Needle Holder Straight	1
16.	Needle holder CVD	1
17.	Scissors CVD Dissecting (Mayo)	1
18.	Suture Cutting Straight Scissor	1
19.	Dissecting Fine CVD Scissor (Metzenbaum)	1
20.	Babcocks Forceps	2
21.	Kidney Tray	1
22.	Bowl (Medium)	1
23.	Non Toothed Forceps 8"	1
24.	Allis Forceps 6"	4
25.	Doyen's Retractor Large	1
26.	Dever's Retractor Large	1
27.	Suction Tip Straight 8mm All SS	1
28.	Wrigley Outlet Forceps	1 set

## Certifications

Quality certificate

CE or BIS or ISO

*Dr. Devyani Misra*  
**Dr. Devyani Misra**  
 Professor Junior Grade  
 Department of OBGYN  
 RPGMCSRH, Dr. RMLIMS

*Prof. P.K. Das*  
**Head of The Deptt.**  
 Of Gynaecological Oncology  
 K.G. Medical University  
 Uttar Pradesh, Lucknow

*Prof. P.K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anatomical Pathology & CCM  
 Dr. RML, Lucknow

*Dr. P.K. Das*  
**DR. P. K. DAS**  
 Director  
 Dept. of Gyn. & Oncol.  
 K.G. Medical University  
 Lucknow



2. Diathermy Pad/Patient plate-adult/pediatrics with patient plate cable if Reusable -01 with a shelf life of minimum 50 applications and if disposable 50 pcs
3. Monopolar two pedal footswitch 100% Washable/Water resistant(for terminal disinfection) with minimum shelf-life of 1000 applications or 24 months from date of supply - 1 no.
4. Bipolar one pedal footswitch 100 % Washable / Water resistant (for terminal disinfection) - with a minimum shelf life of 1000 applications or 24 months from date of supply - 1 no
5. Monopolar electrosurgical pencil with different electrodes either Reusable 01 Unit with reusable 05 electrodes of various shapes with a shelf life of minimum 50 applications or Disposable-50 units.
6. Nonstick Bipolar forceps Straight & bayonet each with bipolar cord for forceps either Reusable 01 Unit with a shelf life of minimum 50 applications or Disposable-50 Units.
7. Reusable universal adaptor for attaching several Laparoscopic hand instruments with a shelf life of a minimum of 50 applications - 1 no.
8. Cart with castors with unconditional replacement if break within 05 years from the date
9. Required Disposable/ Reusable hand pieces for laparoscopic and open surgery (for each unit).

Sr. No.	Items	Qty. (each unit)
1	Laparoscopic (various sizes)	06 Nos.
2	Open (various sizes)	04 Nos.

**Certifications**

Quality certificate USFDA or CE	
Electrical Certification IEC 60601	

*Stamp*  
 Dr. SHAMLI AGARWAL  
 Professor  
 Dept. of Obs. & Gynaecology  
 R.G.M.C. Sr. Hospital, Lucknow

*W*  
 Head of The Deptt.  
 Of Gynaecological Oncology  
 K.G. Medical University  
 Uttar Pradesh, Lucknow

*Misra*  
 Dr. Devyani Misra  
 Professor Junior Grade  
 Department of OBGYN  
 RPGMCSRH, Dr. RMLIMS

*P.K. Das*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## Cryo Surgical System

Sl. No	Specification
1	Operating Pressure Range : 40-60 bar.
2	Coolant: N <sub>2</sub> O or CO <sub>2</sub> in two cylinders (A type).
3	The unit should have Manometer to monitor operating pressure and method to regulated pressure.
4	A different indicator (dual trigger system for freezing and deep freezing) lamp to indicate freezing and defrosting phase.
5	Should have a connection pipe for gas exhaust.
6	It should be mounted in a cart with cylinder case for easy mobilization
7	Activation should be via footswitch or hand control.
8	Min freezing temperature should reach within 5 seconds.
9	It should be supplied with multiple different sized probe-tips to cater for cervical cryocautery of lesion of minimum 4 sizes.
10	All cryo probes and accessories should be autoclavable.
Quality certificate USFDA or CE	
Electrical Certification IEC 60601	

*Samp*  
 Dr. SHREY AGARWAL  
 Professor  
 Dept. of Obs. & Gynaec.  
 G.S.V.M. Medical College  
 Lucknow

*ll*  
 Head of The Dept.  
 Of Gynaecological Oncology  
 K.G. Medical University  
 Uttar Pradesh, Lucknow

*P. K. Das*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

*Misra*  
 Dr. Devyani Misra  
 Professor Junior Grade  
 Department of OBGYN  
 RPGMCSRH, Dr. RMLIMS



## EA &amp; ECC Set

S.No.	NAME OF INSTRUMENT	Quantity
1.	Tray Large with lid	1
2.	Sponge Holder 8"	1
3.	Sim's Speculum Medium	1
4.	Ant Vaginal Wall Retractor	1
5.	Volsellum	1
6.	Uterine sound	1
7.	Hegar's Dilators 4-8 mm	1 set
8.	Sharp & Blunt Curette	1
9.	Karman's Cannula Disposable No. 4,5,6	1 each
10.	EB Forceps	1
11.	Non Toothed Forceps 8"	1
12.	Artery Forceps 6"	1
13.	Bowl (Medium)	1
14.	Allis Forceps 8"	1

## Certifications

Quality certificate

CE or BIS or ISO

*Samp*  
 Dr. SHALY AGARWAL  
 Professor  
 Dept. of Obs. & Gynaec.  
 G.B.P. Medical College  
 Kanpur

*Devani*  
 Dr. Devyani Misra  
 Professor Junior Grade  
 Department of OBGYN  
 RGMCSRH, Dr. RMLIMS

*ll*  
 Head of the Deptt.  
 Of Gynaecological Oncology  
 K.G. Medical University  
 Uttar Pradesh, Lucknow

*P.K.D.*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## D&amp;C And MTP Set

S.No.	NAME OF INSTRUMENT	Quantity
1.	Tray Large with lid	1
2.	Sponge Holder 8"	2
3.	Sim's Speculum Medium	1
4.	Ant Vaginal Wall Retractor	1
5.	Volsellum	1
6.	Uterine sound	1
7.	Hegar's Dilators 4-10 mm	1 set
8.	Ovum Forceps	1
9.	Sharp & Blunt Curette	1
10.	Suction Tubing	1
11.	Karman's Cannula Disposable No. 6,7,8,10	1 each

## Certifications

Quality certificate

CE or BIS or ISO

*Shal*  
 Dr. SHALINI KUMAR  
 Professor  
 Dept. of Obs. & Gynaecology  
 K.G.M. Medical College  
 Lucknow

*Misra*  
 Dr. Devyani Misra  
 Professor Junior Grade  
 Department of OBGYN  
 RPGMCSRH, Dr. RMLIMS

*U*  
 Head of The Deptt.  
 Of Gynaecological Oncology  
 K.G. Medical University  
 Uttar Pradesh, Lucknow

*P.K. Das*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**Hysteroscope Set (4mm / Standard Hysteroscope)**

1	Forward-Oblique Telescope 30°, enlarged view, diameter 4mm, length 30 cm, autoclavable, fiber optic light transmission incorporated.	1
2	Diagnostic Hysteroscope sheath – inner and outer (one each) for Diagnostic continuous irrigation	1
3	Operative Hysteroscope sheath – inner and outer (one each) for Operative continuous irrigation	1
4	<b>SEMI RIGID INSTRUMENTS FOR USE WITH OPERATING HYSTEROSCOPE.</b>	
4a	Scissors semi rigid, pointed tip, 5Fr., length 33-36cm, single action jaws.	1
4b	Grasping forceps semi rigid, 5Fr., length 33-36cm, double action jaws	1
4c	Biopsy semi rigid 5Fr, length 33-36cm	1
4d	unipolar needle Electrode, 5 Fr., length 34 cm, unipolar - with Cable	1
4e	Bipolar Dissection Electrode, 5Fr, 36cm, Bipolar - with Cable	1

**TCRE / Resectoscope Set (Unipolar and Bipolar) 26Fr (4mm).**

1	Unipolar Working Element to be used with 26 Fr Resectoscope sheath: Motion by means of a spring. The thumb support is movable. Return of the loop is controlled by the thumb and in rest position the electrode should rest inside the operating sheath, to be used with 4mm hysteroscopy telescops.	1
2	Bipolar Working Element to be used with 26 Fr Resectoscope sheath: Motion by means of a spring. The thumb support is movable. Return of the loop is controlled by the thumb and in rest position the electrode should rest inside the operating sheath, to be used with 4mm hysteroscopy telescope.	1
3	Continuous Flow Resectoscope Sheath 26Fr; including connection tubes for in- and outflow, 2 LUER-lock adaptors, 26Fr, oblique beak, rotating inner tube, with ceramic insulation, for use with working element.	1
4	Unipolar Cutting loop 26Fr	6
5	Unipolar Cutting Electrode 26Fr, Pointed	6
6	Unipolar Coagulating Electrode 26Fr, ball end	6
7	Bipolar Cutting loop 26Fr.	6
8	Bipolar Cutting Electrode 26Fr, Pointed	6
9	Bipolar Coagulating Electrode 26Fr, ball end	6
10	HF Cable Unipolar Resectoscope	2
11	HF Cable Bipolar Resectoscope.	2

**Certifications**

Quality certificate  
USFDA or CE

*Dr. Devyani Misra*  
**DR. DEVIYANI AGARWAL**  
 Professor  
 Dept. of Obs. & Gynaecology  
 K.G. Medical College  
 Lucknow

*Dr. Devyani Misra*  
**Dr. Devyani Misra**  
 Professor Junior Grade  
 Department of OBGYN  
 RPGMCSRH, Dr. RMLIMS

*Dr. P.K. Das*  
**Head of The Deptt.**  
**Of Gynaecological Oncology**  
**K.G. Medical University**  
**Uttar Pradesh, Lucknow**

*Dr. P.K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## IUCD Insertion Set

S.No.	NAME OF INSTRUMENT	Quantity
1.	Tray Large with lid	1
2.	Sponge Holder 8"	1
3.	Volsellum	1
4.	Uterine sound	1
5.	Artery Forceps 6"	1
6.	Bowl (Medium)	1
7.	Allis Forceps 8"	1
8.	Cusco's Speculum Small, Medium, Large	1 each
9.	Suture Cutting Scissor (Mayo Straight)	1

## Certifications

Quality certificate

CE or BIS or ISO

*Dr. S. K. Das*  
 Dr. S. K. Das  
 Professor  
 Dept. of Obs. & Gynaecology  
 R.P.G.M.C.S.R.H., Lucknow

*Dr. Devyani Misra*  
 Dr. Devyani Misra  
 Professor Junior Grade  
 Department of OBGYN  
 R.P.G.M.C.S.R.H., Dr. RMLIMS

*Dr. P. K. Das*  
 Head of The Deptt.  
 Of Gynaecological Oncology  
 K.G. Medical University  
 Uttar Pradesh, Lucknow

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## Hysteroscopy set

S. No.	Technical Specifications
1.	<b>Telescope</b> <ol style="list-style-type: none"> <li>Forward Oblique Telescope, 30°, Diameter 2.9mm, Length 21-30cm</li> <li>Forward Oblique Telescope, 0°, Diameter 2.9mm, Length 21-30cm</li> <li>Outer Continuous flow examination sheath</li> <li>Operative sheath for 2.9mm Forward Oblique Telescope 0° and 30°, Length 30cm±5cm with working channel for instrument of 5Fr.</li> <li>Continuous flow operative sheath with channel</li> </ol>
2.	<b>Hysteromat</b> <ol style="list-style-type: none"> <li>Should provide high visualization with desired distension</li> <li>Should offer precision during Hysteroscopy procedures</li> <li>Should be safe to use</li> <li>Should have micro controller technology with SAPC</li> <li>Function should be fully automatic with electronic and digital controls.</li> <li>Should have automatic sensor for pressure and flow rate</li> <li>Maximum pressure capacity should be 400mm of Hg</li> <li>Maximum Flow rate should be 1 litre/minute</li> <li>Tubing should be of durable material requiring minimum maintenance</li> <li>Digital display for preset and actual pressure</li> <li>Digital display for Flow rate</li> <li>Digital display for consumed volume</li> <li>Should be provided with accessories - Silicon tubing and power cord</li> </ol>
3.	<b>Camera</b> <ol style="list-style-type: none"> <li>Should have High definition (HD) or higher resolution (minimum of 1080p resolution)</li> <li>Should have Excellent Image quality, color reproduction, sharp details, and minimal pixelation.</li> <li>Should have Optical zoom for precise magnification of the surgical field.</li> <li>Should have high sensitivity to low light conditions for clear visualization in the uterine cavity.</li> <li>Camera head controls should have ability to adjust camera settings like white balance, gain, and sharpness directly from the camera head.</li> <li>Compatibility: Compatible with the chosen hysteroscope and light source.</li> </ol>
4.	<b>Light source</b> <ol style="list-style-type: none"> <li>Should have compact design with low space requirement</li> <li>Should be LED lamp with extremely long-life hours</li> <li>Should generate low noise</li> <li>Light cable connection port should have ergonomic design</li> <li>Optional bracket for mounting on a monitor</li> </ol>
5.	<b>Fibre Optic Cable</b> Length 2300mm ± 5 %; Diameter 4.8mm±0.5mm
6.	<b>Hand instruments for hysteroscopic surgery</b> <ol style="list-style-type: none"> <li>Biopsy and grasping forceps, semirigid, double action jaws, 5 Fr., length 34cm±2cm</li> </ol>

*Sand*  
 Dr. Nishu Mishra  
 Professor  
 Dept. of O.G. & Gynaecology  
 R.G.M.C.S.R.H., Lucknow

*Mansu*  
 Dr. Devyani Misra  
 Professor Junior Grade  
 Department of OBGYN  
 RPGMCSRH, Dr. RMLIMS

*P.K. Das*  
 Head of The Deptt.  
 Of Gynaecological Oncology  
 K.G. Medical University  
 Uttar Pradesh, Lucknow  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. B.S. Medical College, Lucknow

	<ul style="list-style-type: none"> <li>b) Scissors, semirigid, blunt, single action jaws, 5 Fr., length 34cm±2cm</li> <li>c) Scissors, pointed, single action jaws, semirigid, 5 Fr., length 34cm±2cm</li> <li>d) Biopsy spoon forceps, semirigid, double action jaws, 5 Fr., length 34cm±2cm</li> <li>e) Needle electrode, unipolar 5Fr., length 34cm±2cm</li> <li>f) Ball electrode, unipolar 5Fr., length 34cm±5cm</li> <li>g) Unipolar high Frequency cord</li> <li>h) Bipolar dissection electrode, semi rigid, 5Fr., length 34cm±2cm</li> <li>i) Bipolar dissection electrode, semi rigid, 5Fr., 90 degree angled, length 34cm±2cm dedicated for use of telescopic specifications</li> <li>j) Bipolar Ball electrode, semi rigid, 5Fr., length 34cm±2cm</li> <li>k) Bipolar high Frequency cord</li> </ul>
7.	<p><b>Resectoscope</b></p> <ul style="list-style-type: none"> <li>a) Telescope, 4mm, 30 degrees, Length 21-30cm</li> <li>b) Resectoscope working element (passive type)</li> <li>c) Resectoscope sheath (26Fr.)</li> <li>d) Connecting cable</li> <li>e) Cutting loop</li> <li>f) Colling knife</li> <li>g) Roller ball</li> </ul>
8.	<b>Medical monitor - Compatible with Camera and Light source</b>
9.	<b>Video cart (ergonomic design)</b>
10.	<b>Tray for sterilization and storage</b>

**Certifications**

Quality certificate USFDA or CE	
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**Scope of supply**

<p>Forward Oblique Telescope, 30°, Diameter 2.9mm, Length 21-30cm 1</p> <p>Forward Oblique Telescope, 0°, Diameter 2.9mm, Length 21-30cm 1</p> <p>Outer Continuous flow examination sheath 1</p> <p>Operative sheath for 2.9mm Forward Oblique Telescope 0° and 30°, Length 30cm±5cm, with working channel for instrument of 5Fr 1</p> <p>Continuous flow operative sheath with channel 1</p> <p>Hysteromet 1</p> <p>Resectoscope with instruments 1 set</p> <p>Monitor 1</p> <p>Cart 1</p> <p>Storage box 1</p> <p>Future up gradation required</p>	
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Should be compatible with all medical grade monitors. Should have recording and storage facility.	
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*Saxel*

Dr. Suman Agrawal  
Professor  
Dept. of Obs. & Gynaecology  
RPGMCSRH, Dr. RMLIMS  
Lucknow

*Misra*

Head of the Dept.  
Of Gynaecological Oncology  
Dr. Devyani Misra  
Professor Junior Grade  
Department of OBGYN  
RPGMCSRH, Dr. RMLIMS

*P.K. Das*

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## IUCD Removal Set

S.No.	NAME OF INSTRUMENT	Quantity
1.	Cusco's Speculum Small, Medium, Large	1 each
2.	Artery forceps 6"	1

## Certifications

<u>Quality certificate</u> CE or BIS or ISO
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*Dr. Misra*  
 Dr. Devyani Misra  
 Professor Junior Grade  
 Department of OBGYN  
 RPGMCSRH, Dr. RMLIMS

*P.K. Das*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

*ll*  
 Head of The Deptt.  
 Of Gynaecological Oncology  
 K.G. Medical University  
 Uttar Pradesh, Lucknow

*Dr. Ghosh*  
 Dr. GHOSH ANILKANT  
 Professor  
 Dept. of Obs. & Gynaec.  
 K.G. Medical University  
 Lucknow

## FETAL MONITOR

1	Should have 6" or more high-resolution color TFT/LCD Display with Tilttable Screen for better viewing
2	Should have the facility for dynamic data save
3	Should display the monitoring information of the last 24 hours
4	Should have special high sensitive watertight probe for better durability
5	Should have data storage with playback & print facility
6	Should have the low ultrasound power for the safety of the foetus
7	Should have automatic foetal movement detection with the event marker
8	Thermal printer with minimum 152MM paper width is essential for broader printouts
9	Standard configuration should be FHR, TOCO, Foetal Movement.
10	Twin FHR monitoring is essential.
11	Should be portable
12	Built-in rechargeable Li-on battery with back up of at least one hour or suitable UPS need to be supplied
13	Should have work with input 200 to 240Vac 50 Hz supply.
	Accessories:
14	i. Gel - 4 bottle ii. Thermal paper- 10Nos
15	Should provide belt for both fetal heart and toco transducer
16	Should be supplied with suitable Stainless steel trolley

### Certifications

<b>Quality certificate</b> USFDA or CE or BIS	
<b>Electrical Certification</b> IEC 60601	

*Scanned*  
 Dr. SHASHI KUMAR  
 Director  
 Dept. of Obst. & Gynaecology  
 K.G. Medical University  
 Lucknow

*Dr. Devyani*  
**Dr. Devyani Misra**  
 Professor Junior Grade  
 Department of OBGYN  
 RPGMCSRH, Dr. RMLIMS

*H*  
 Head of The Deptl.  
 Of Gynaecological Oncology  
 K.G. Medical University  
 Uttar Pradesh, Lucknow

*P.K.D.*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## Normal Delivery set

S.No.	NAME OF INSTRUMENT	Quantity
1.	TRAY WITH LID (LARGE)	1
2.	SPONGE HOLDER - 8"	2
3.	KIDNY TRAY (LARGE)	1
4.	KIDNY TRAY (SMALL)	1
5.	BOWL MEDIUM SIZE	1
6.	SIM'S SPECULUM MEDIUM SIZE	2
7.	EPISITOMY SCISSOR	1
8.	STITCH CUTTING SCISSOR	1
9.	NEEDLE HOLDER STRAIGHT - 8"	1
10.	KOCHER'S CLAMP - 8"	2
11.	TOOTHED FORCEPS STRAIGHT-8"	1
12.	ARTERY FORCEPS STRAIGHT - 6"	2
13.	ALLIS FORCEPS - 6"	2
14.	ALLIS FORCEPS - 8"	1

## Certifications

Quality certificate

CE or BIS or ISO

*Dr. P.K. Das*  
 DR. P.K. DAS  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 K.G. Medical University, Lucknow

*Dr. Devyani Misra*  
 Dr. Devyani Misra  
 Professor Junior Grade  
 Department of OBGYN  
 RPGMCSRH, Dr. RMLIMS

*Dr. P.K. Das*  
 Head of The Deptt.  
 Of Gynaecological Oncology  
 K.G. Medical University, Lucknow  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**PEDESTAL OT LIGHT****1. Technology of Light Emission of OT Light:**

LED Technology

**2. Material of Head Lamp:**

ABS

**3. Range of Light Intensity in Luminous At 1 Meter Distance With Tolerance  $\pm$  5000:**

160000

**4. Range of Colour Temperature in Kelvin:**

3700-4500

**5. Life Span of LED in Hours:**

40000 or above

**6. Range of Illuminated Field Diameter in Mm:**

200-400 or better

**7. Colour Rendering Index (CRI):**

95 or better

**8. Type of Control Panel:**

Manual and Touch Screen

**9. Range Of Depth of Illumination of OT Light in Cms:**

60 - 125 or better

**10. Type of Lamp Head:**

Single non winged round shape lamp head for easy maintenance and better sealing against dust and fumigation

**11. Diameter of Lamp Head in Mm with Tolerance Of  $\pm$ 20 Mm:**

500 or above

**Conditions for tender:****Certifications**

Quality certificate USFDA or CE or BIS
Electrical Certification IEC 60601

*Saur*  
Dr. SHADY AGARWAL  
Professor  
Dept. of Obs. & Gynaec.  
G.S.V.M. Medical College  
Bareilly

*Darius*  
Dr. Devyani Mishra  
Professor Junior Grade  
Department of OBGYN  
RPGMCSRH, Dr. RMLIMS

*U*  
Head of The Deptt.  
Of Gynaecological Oncology  
K.G. Medical University  
Uttar Pradesh, Lucknow

*P.K.D.*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## USG Fetal Doppler Machine

- 1.1. Dimension: 135mmx95mm x35mm, Weight 500g
- 1.2. Power Consumption :<1w
- 1.3. Probe: should be (water proof)
- 1.4. Working System: Continuous running equipment.
- 1.5. Suitable Using Range: Suitable for use after the 12th week of pregnancy
- 1.6. Display: LCD display of real-time fetal heart rate and low battery indicator
- 1.7. Active noise reduction for clear fetal heart sound.
- 1.8. Should have built In loudspeaker
- 1.9. Alarm when FHR out of normal range.

### 2. FHR Performance

- 2.1. FHR Measuring Range: 50~240BPM (BPM: beat per minute)
- 2.2. Resolution: 1BPM
- 2.3. Accuracy:  $\pm 2$ BPM
- 2.4. Auto Shut-OFF: After at least 3 minute no signal, power off automatically.

### 3. Probe:

- 3.1. Nominal Frequency: 2.0MHz
- 3.2. Probe Cable Length minimum 3.0m
- 3.3. Working Frequency: 2.0MHz $\pm 10\%$
- 3.4. Working Mode: Continuous wave Doppler

### 5. Power Supply

- 5.1. Power input to be 220-240VAC, 50Hz fitted with Indian plug
- 5.2. In-built rechargeable battery backup that is concealed in the unit and recharges automatically when connected to AC mains.

### Certifications

Quality certificate  
USFDA or CE

Electrical Certification  
IEC 60601

*Shashi*  
Dr. SHASHI ABALONIA  
Professor  
Dept. of Obs. & Gynaecology  
K.G. Medical College  
Lucknow

*Damini*  
Dr. Devyani Misra  
Professor Junior Grade  
Department of OBGYN  
RPGMCSRH, Dr. RMLIMS

*ll*  
Head of The Deptt.  
Of Gynaecological Oncology  
K.G. Medical University  
Uttar Pradesh, Lucknow

*P.K.D*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## DIGITAL VIDEO CALPOSCOPE

1. Should have > 1000 TV Lines.
2. Should have Full HD- 1920 x 1080 resolution.
3. Should have - (1/3 type CMOS sensor) and aspect ratio of 16:9 (HD) for cinema like picture
4. Must have magnification from min. 1x to max. 55 x.
5. Should have variable light intensity & Varying image color (5 different settings)
6. Should have 20,00,000 no. of pixels
7. Zoom in and Zoom out should be on the colposcope.
8. High MCD super bright white shadow less LED light for true color reproduction.
9. Color temperature should be 7000° k, light source life should be minimum 50000 hrs.
10. Auto focus range should be up to 20-30 cm/ 30-40 cm.
11. Facility for fast focusing, zooming, image freeze, manual focus using thumb on the hand held unit itself.
12. Should be with E-flip & Mirror image function to ensure extended attention and perfect diagnosis.
13. Acetic test timer and magnification indicator should be displayed on screen.
14. There must be 4 steps Electronic Green Filter and 1 step blue in the hand-held unit without decrease in illumination.
15. Control panel should have feather touch and water proof buttons
16. Should have facility for auto and manual focus
17. It should be equipped with Gamma Processor to enhance vascular structure
18. It should have wireless Remote Control facility, So that it can be operated from a distance.
19. Should be equipped with a built-in battery backup, minimum of 4 hours for uninterrupted examinations and diagnoses.
20. It should have USB and HDMI output for simultaneously display on Monitor & Computer / Laptop/Tablet.
21. No External Capture card to be used for connecting of computer/ Laptop. Company should provide Colposcopy Image Management software with computer/ laptop & Mobile App with

### Certifications

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USFDA or CE

Electrical Certification  
IEC 60601

*Saral*  
Dr. SHALU AGARWAL  
Professor  
Dept. of Obs. & Gynaecology  
K.G. Medical University  
Lucknow

*Devyani*  
Dr. Devyani Misra  
Professor Junior Grade  
Department of OBGYN  
RPGMCSRH, Dr. RMLIMS

*U*  
Head of The Deptt.  
Of Gynaecological Oncology  
K.G. Medical University  
Uttar Pradesh, Lucknow

*P.K.D.*  
Prof. P.K. Das  
Professor & Head  
Department of Anaesthesiology & CCU  
K.G. Medical University, Lucknow

Sl No	Vacuum Extractor with cups
1	A controlled high pressure noiseless VAD system having compact design with convenience, precision and safety with good mobility.
2	It should be based on maintenance free heat resistant, high tech piston/cylinder technology for long lasting dependable operations.
3	It should be vibration free and noiseless working in operating theatres as well as in patient work.
4	It should not have noise level more than of 37-39 dB at 1 meter distance.
5	It should have autoclavable double jars (2.5ltr.) of unbreakable PC (Poly Carbonate)/ unbreakable PSU material with disposable collection system with highly burst resistant and double layers liners.
6	The collection system should have overflow protection / bacteria filter, pre filter and a non-return valve.
7	It should have disposable specimen cup to collect tissue samples.
8	It should have automatic vacuum connection for jars.
9	It should have pump displacement of at least 60 ltr/min for more.
10	It should have option to choose variable flow rate of 40 l, 50 l, 60 l to make surgery more easy with simply touch the clean touch buttons.
11	It should have vacuum of at least -95 kPa (-713 mmHg) or more.
12	It should have front display vacuum gauge with membrane regulator
13	It should have medical grade silicon cups of 50 mm, 60 mm and bird cups of 40 mm, 50 mm, 60 mm with traction handle.
14	It should also have foot on/off switch integrated into the trolley for hands-free operation.
15	It should be fitted on well balanced mobile trolley with 4 antistatic locking castors.

### Certifications

Quality certificate  
USFDA or CE

*[Signature]*  
 Professor  
 Dept. of Obs. & Gynaecology  
 K.G.M. Medical College  
 Lucknow

*[Signature]*  
 Dr. Devyani Misra  
 Professor Junior Grade  
 Department of OBGYN  
 RPGMCSRH, Dr. RMLIMS

*[Signature]*  
 Head of The Deptt.  
 Of Gynaecological Oncology  
 K.G. Medical University  
 Uttar Pradesh, Lucknow

*[Signature]*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## VAGINAL HYSTERECTOMY SET / VAGINAL REPAIR SET

Sl. No	Item	Qty per set
1	BP Handle No.03,04	
2	Bladder Sound	1 each
3	Dissecting Forceps plain 6"	1
4	Dissecting Forceps toothed 6"	1
5	Artery Forceps Stght 8"	1
6	Artery Forceps Cur 8"	2
7	Artery Forceps Cur 6" Medium (FINE)	8
8	Mosquito Artery Forcep Cur 5"	4
9	Artery Forceps str 6"	4
10	Langenback Retractor 8x35mm	4
11(i)	Allis Tissue Forceps 6"	1
11(ii)	Allis Tissue Forceps 8"	4
12	Kidney Tray 8" S.S.	4
13	Bowl S.S. 6"	2
14(i)	Metzenbaum Scissor Cur 6" (TC TIP)	2
14(ii)	Metzenbaum Scissor Cur 8" (TC TIP)	1
15(i)	Needle Holder 6" (TC TIP)	1
15(ii)	Needle Holder 8" (TC TIP)	1
16	Sponge Holding Forcep 8"	1
17(i)	Suction Tip Yankeur All S.S.	2
17(ii)	Suction Tip Pool Stght 8mm All S.S.	1
18(i)	Cross Action Towel Clips Engl.Mod. Angled 3.5"	1
18(ii)	Cross Action Towel Clips Backhaus 3"	3
19	Heaney Atrauma Straight Hysterectomy Clamps	2
20	Heaney Atrauma Curved Hysterectomy Clamps	2
21	Mayo's Scissors (TC TIP) - 6" and 8" Curved	4
	<b>Certifications</b>	1 each

**Quality certificate**  
USFDA or CE or BIS

*Shaly*  
Dr. SHALY AGARWAL  
Professor  
Dept. of Obs. & Gynaecology  
U.S.V.M. Medical College  
Kanpur

*Devyani*  
Dr. Devyani Misra  
Professor Junior Grade  
Department of OBGYN  
RPGMCSRH, Dr. RMLIMS

*P.K.Das*  
Head of The Deptt.  
Of Gynaecological Oncology  
K.G. Medical University Prof. P.K. Das  
Uttar Pradesh, Lucknow Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Operative Laparsocopy Set- Advanced

S. No.	Technical Specification	Qty.
1	Veress Needle: Veress Needle with spring loaded blunt stylet with luer lock and length of 100 - 120 mm	1
2	Veress Needle: Versess Needle with spring loaded blunt stylet with luer lock and length of 130 - 150 mm	1
3	Telescope: -	
	10 mm 30 degree scope with working length of at least 270 mm telescope.	1
	5 mm 30 degree telescope.	1
	Fiber optic light transmission incorporated, should be compatible with the light cables	
	Can be sterilized by autoclaving or standard sterilization methods.	
4	Trocar, with Pyramidal Tip with cannula flap valve	
	For 5mm port	2
	For 10mm port	2
5	Reducer 10mm-5mm	1
		1
A.	<b>4K Camera Head with recorder</b>	
i.	Must have a resolution of 3840*2160 pixels and progressive scan to guarantee genuine 4k (UHD) picture	1
ii.	CMOS with progressive scan	1
iii.	The system should have facility of at least 2x Zoom (optical or Digital)	
iv.	Must be compatible with all standard Telescopes	
B	<b>True 4k Ultra-High-Definition (UHD) Monitor</b>	
i.	Medical Grade Monitor	1
ii.	Minimum size of 31"	
iii.	Must have effective resolution of 3840*2140 pixel to display pure 4k images	
iv.	Medical Grade Monitors from Sony/LG/NDS/Barco/Panasonic acceptable.	
C	<b>Documentation and Archiving System</b>	
i.	Must be able to record videos and images in at least Full High Definition 1920*1080 pixels (pure 4k format of 3840*2160 pixel preferable).	1
ii.	State of the art user friendly medical grade system (certified to be used in OT) should be offered.	
iii.	User should have full control of the system from the sterile field via camera head buttons	
iv.	Must be with 1 TB Memory (external)	
D	<b>Light Source</b>	
		1

*Dr. Shree Adarsh*  
 Dr. SHREE ADARSH  
 Professor  
 Dept. of Obs. & Gynae.  
 G.B.P.M. Medical College  
 Varanasi

*Dr. Devyani Misra*  
 Dr. Devyani Misra  
 Professor Junior Grade  
 Department of OBGYN  
 RPGMCSRH, Dr. RMLIMS

*Prof. P.K. Das*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & Critical Care  
 Dr. RMLIMS, Lucknow

*Head of the Deptt.*  
 Head of the Deptt.  
 Of Gynaecological Oncology  
 K.G. Medical University  
 Uttar Pradesh, Lucknow

i.	High Intensity (6000K) LED Light Source	
ii.	Light hours > 40,000	
	<b>Fiber optic light cable</b>	
i.	Length should be 2300mm with Diameter 4.8mm.	2
ii.	Should be highly flexible and autoclavable.	
<b>F</b>	<b>Co2 Endoflator</b>	1
i.	Should be full automatic electronic insufflator	1
ii.	Flow rate at least 30 Liters/ min or more (lower capacity will not be acceptable)	1
iii.	Must have digital display for all preset and real time values.	1
iv.	Must have automatic alarm and pressure control systems in case of over pressure.	
v.	High pressure hose suitable for connecting endoflator with pin indexed CO2 cylinder	
vi.	Wrench kit suitable for connecting endoflator with pin indexed CO2 cylinder	
vii.	CO2 bottle of at least 10 kg capacity	1
<b>G</b>	<b>Mobile Video Cart</b>	1
i.	Must be from the same manufacturer (local alternates not acceptable).	
ii.	Must have minimum 2-3 shelves and drawer.	
iii.	Must have Monitor Arm which can be swivelled in all directions.	
iv.	Must have ergonomic design and concealed cable conduits	
<b>H</b>	<b>Essentials</b>	
i.	Mains Cord	
ii.	Operations Manual	
iii.	Service Manuals	
iv.	Formalin Chamber (for sterilizations of laparoscopy instruments)	1
v.	Tray for Sterilizations of laparoscopy instruments	1
<b>J</b>	<b>Hand Instruments.</b>	
	a) All forceps must be 5mm in Diameter and have a Length of 35cms (plus-minus 2 cms) unless otherwise mentioned.	
	All forceps must be completely dismantlable into 3 parts for easy cleaning and disinfection.	

*Stamp*  
 Dr. SHARMA  
 Head of the Deptt.  
 of Gynaecological Oncology  
 K.G. Medical University  
 Lucknow

*Dr. Devyani*  
 Dr. Devyani Misra  
 Professor Junior Grade  
 Department of OBGYN  
 RPGMCSRH, Dr. RMLIMS

*Head of The Deptt.*  
 Head of The Deptt.  
 Of Gynaecological Oncology  
 K.G. Medical University  
 Uttar Pradesh, Lucknow  
*P.K. Das*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

1	Standardjaw Maryland dissector.	1
2	2x4 tooth Grasping forceps.	1
3	Atraumatic and Fenestrated graspingforceps-double actionjaw.	1
4	LongCurved Jaw, Atraumatic-Fenestrated graspingforceps.	1
5	Matzenbaumcurved scissors.	1
6	Toothforceps,toothtype-10mmdiameter.	1
7	Bipolar Forceps, 5mm, 36 cms	1
8	Bipolar Connecting Cable	1
9	L-Hook, 5mm, 36 cms	2
10	Spatula, 5mm, 36 cms	1
11	Unipolarconnectingcable	1
12	5mmSuction Irrigationtube	2
13	NeedleHolder, 5mm, 36 cms. Jaws curved left.	1

**Certifications**

Quality certificate  
USFDA or CE

Electrical Certification  
IEC 60601

**Future up gradation required**

Fluorescence imaging

Head of The Deptt.  
Of Gynaecological Oncology  
K.G. Medical University  
Uttar Pradesh, Lucknow

*P.K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

*Dr. Misra*  
Dr. Devyani Misra  
Professor Junior Grade  
Department of OBGYN  
RPGMCSRH, Dr. RMLIMS

*Dr. Sanyal*  
Dr. Sanyal  
Department of OBGYN  
RPGMCSRH, Dr. RMLIMS

## Technical Specifications Gynaecology Examination Table

S. No.	Technical Specifications
1.	<p><b>Gynaecology Examination Table</b></p> <ol style="list-style-type: none"> <li>a) Should have 3 sectional mattress bases with large perineal cut out and detachable leg section.</li> <li>b) It should have base and column made up of coated steel and covered with ABS plastic moulds to prevent damage and ease of cleaning</li> <li>c) Should be fitted with seamless upholstery for ease of cleaning</li> <li>d) Should have electrical stepless adjustment for height, Seat section and back section.</li> <li>e) Should have Trendelenburg and reverse Trendelenburg using foot controller</li> <li>f) It should be possible to keep foot controller anywhere around the couch as per convenience of the paramedical staff/ clinician</li> <li>g) Should also have a handheld controller with equal performances and three user programmable positions for user convenience</li> <li>h) Should be equipped with paper roll holder under the back section for disposable single sheet for each patient</li> <li>i) Should be equipped with side rail on back and seat section to fix additional equipment/accessories needed during procedure</li> <li>j) Should have retractable stainless steel basin for fluid collection and to be used for keeping instruments</li> <li>k) Should be mobile and equipped with central braking system for easy maneuvering</li> <li>l) Should have minimum patient load capacity of 200Kg <math>\pm 10\%</math></li> <li>m) Should have stepless electrical adjustment using foot controller and Hand controller for               <ol style="list-style-type: none"> <li>a. Height - 560-860mm<math>\pm 5</math>mm</li> <li>b. Back section - 70<math>^{\circ}</math><math>\pm 5^{\circ}</math></li> <li>c. Seat Section - +5<math>^{\circ}</math> to -65<math>^{\circ}</math></li> <li>d. Trendelenburg - 10<math>^{\circ}</math></li> <li>e. Reverse Trendelenburg - 65<math>^{\circ}</math></li> </ol> </li> <li>n) Dimensions:               <ol style="list-style-type: none"> <li>a. Width (Seat Section) - Min 570mm<math>\pm 5\%</math></li> <li>b. Length (with leg plate) - Min 1750mm<math>\pm 5\%</math></li> <li>c. Length (without leg plate) - Min 1300mm<math>\pm 5</math></li> </ol> </li> <li>o) Should be supplied complete with following Accessories:               <ol style="list-style-type: none"> <li>a. Hand rest, Knee rest. &amp; foot rest with possibility of Height, angle and shift adjustment (Pair)</li> <li>b. Paper roll holder</li> <li>c. Drip bottle holder with height adjustment</li> <li>d. Urological bowl</li> <li>e. Detachable leg section</li> </ol> </li> </ol>

*Dr. Devyani Misra*  
 Dr. Devyani Misra  
 Professor Junior Grade  
 Department of OBGYN  
 RPGMCSRH, Dr. RMLIMS

*Dr. Devyani Misra*  
 Dr. Devyani Misra  
 Professor Junior Grade  
 Department of OBGYN  
 RPGMCSRH, Dr. RMLIMS

*P.K. Das*  
 Head of The Deptt. Prof. P.K. Das  
 Of Gynaecological Oncology Professor & Head  
 K.G. Medical University Dept. of Anaesthesiology & CCM  
 Uttar Pradesh, Lucknow Dr. RMLIMS, Lucknow

**Certifications**

368

Quality certificate USFDA / CE
Electrical Certification IEC 60601

**Scope of supply**

Gynaecology Examination Table 1 Hand rest, Knee rest & foot rest 1 pair Paper roll holder 1 Drip bottle holder with height adjustment 1 Urological bowl 1 Detachable leg section 1
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*[Handwritten signature]*

Dr. K. S. JAIN  
Department of Obstetrics & Gynaecology  
G.S.V.M. Medical College  
Bareilly

*[Handwritten signature]*

Dr. Devyani Misra  
Professor Junior Grade  
Department of OBGYN  
RPGMCSRH, Dr. RMLIMS

*[Handwritten mark]*

Head of The Deptt.  
Of Gynaecological Oncology  
K.G. Medical University  
Uttar Pradesh, Lucknow

*[Handwritten signature]*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Cryotherapy unit

S. No.	Technical Specifications
1.	The equipment should be based on latest air flow technology for therapeutic purposes.
2.	The cooled air should reach the therapeutic location via an application tube.
3.	Air current flow should be able to regulate according to needs.
4.	It should have intelligent air flow control system with temperature up to $-60^{\circ}\text{C}$ .
5.	Equipment should use Room air drawn into the device filtered and cooled to the required therapy temperature.
6.	It should have auto self-detection controlling system.
7.	It should have continuous compressing for an immediate use (standby mode).
8.	It should have provision of self-defrosting system for the best cooling performance.
9.	Display should be user friendly for easy and practical operation preferably inbuilt English and/or Hindi language.
10.	Extensive choice of autoclaveable tips.
11.	Single-hand control from three-position trigger (freeze, off, defrost)
12.	Instant defrost.
13.	Built-in regulators control pressure at tips for added safety and gas economy
14.	Valve body designed and manufactured for long, trouble-free life
15.	Capture "O" ring design to provide positive gas seal where tips attach to probe stem
16.	Ability to change tip during procedure without shutting off gas tank
17.	Nitrous Oxide (N <sub>2</sub> O) and Carbon Dioxide (CO <sub>2</sub> ) option 6 lb. and 20 lb. cylinder options
18.	It should work on power supply of 220-250 V - 50/60 Hz.
19.	Power consumption should be less than 1500 VA.
20.	It should have graded air flow of at least 1000 l/min.
21.	It should have standby and defrost mode with automatic defrosting.
22.	It should be supplied with hose of 150 cm or more.
23.	5, 10, 15 mm and angled nozzles should be included.
24.	Accessories to allow hands-free/static operation should be included in the standard offer.
25.	All available Accessories with functionality be included in technical and price quotations that would be frozen for the entire duration of warranty/CMC.
26.	It should be equipped for mobile operation.
27.	CVT/UPS and other safety features should be provided for equipment and manpower working on it.

## Certifications

Quality certificate USFDA /CE/ BIS/ISO
Electrical Certification IEC 60601

*Dr. Misra*  
Dr. Devyani Misra  
Professor Junior Grade  
Department of OBGYN  
RPGMCSRH, Dr. RMLIMS

*P.K. Das*  
Head of The Deptt. Prof. P.K. Das  
Of Gynaecological Oncology Professor & Head  
K.G. Medical University Anaesthesiology & CCM  
Uttar Pradesh, Lucknow RMLIMS

**Scope of supply**

Hand held unit 1  
 Carrying Case 1  
 Cart for Gas Cylinder, 6lb or 20lb 2  
 O Ring for Cryo System (3 Per Pack) 5  
 French Adapter For CO2 1  
 French Adapter For N2O 1  
 Cryotherapy Tip 450B 2  
 Purifier Housing 1  
 Filter cartridge for purifier

*Misra*

**Dr. Devyani Misra**  
 Professor Junior Grade  
 Department of OBGYN  
 RPGMCSRH, Dr. RMLIMS

*U*  
**Head of The Deptt.**  
**Of Gynaecological Oncology**  
**K.G. Medical University**  
**Uttar Pradesh, Lucknow**

*P.K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

*Sapna*  
**DR. SHANTI APARNA**  
 Professor  
 Dept. of Che. & Cytopath  
 RMLIMS, Lucknow, U.P.

## MR syringe

S. No.	Technical Specifications
1.	a) Should have capacity of 60 cm <sup>3</sup> (ml) b) Should be made of translucent virgin grade polypropylene for the body, piston rod and piston. c) The washer for leak-proofness provided on the piston shall be made of natural or synthetic rubber or combination of both suitably compounded or vulcanized. d) The syringe shall have good finish and smooth operation. e) The locking of the piston with the piston rod shall be rigid f) The piston and rubber cover shall securely adhere to the piston rod. g) The syringe shall have positive stop for preventing the piston and the piston rod being pulled out completely. h) The button of the pinch cock shall be securely fixed. The pinch cock shall give leak proof locking when pressed in position i) The locking arrangement of the piston rod shall get engaged automatically when the piston is pulled out to maximum position. j) The syringe shall be capable of giving a vacuum of 650 mm of Hg (approx.) up to an altitude of 200 m above sea level. k) The syringe shall be supplied with instructions sheet giving the following: <ol style="list-style-type: none"> <li>a. Complete instructions for use</li> <li>b. Instructions for cleaning</li> <li>c. The cautionary note worded as under: Warning - Do not depress the syringe piston with the cannula in uterus.</li> </ol>

## Certifications

Quality certificate  
USFDA / CE / BIS/ISO

*Dr. Misra*  
**Dr. Devyani Misra**  
 Professor, Junior Grade  
 Department of OBGYN  
 RPGMCSRH, Dr. RMLIMS

*W*  
**Head of The Deptt.**  
 Of Gynaecological Oncology  
 K.G. Medical University  
 Uttar Pradesh, Lucknow

*P.K.D.*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

*Dr. Misra*  
**DR. SHANTANU KUMAR**  
 Professor  
 Dept. of Gen. & Applied  
 G.S.V.M. Medical College  
 Kanpur

## NST machine

S. No.	Technical Specifications
1.	<ul style="list-style-type: none"> <li>a) Should have at least 7-inch Touch Monitor with angle adjustability.</li> <li>b) It should have wireless remote monitoring capabilities.</li> <li>c) Should be compatible for Central Monitoring and Remote Viewing Capabilities</li> <li>d) It should have Fetal Heart Rate (FHR) monitoring using Ultrasound technology.</li> <li>e) It should have Uterine Activity (UA) measurement using TOCO technology.</li> <li>f) It should have Manual Fetal Movement detection capability.</li> <li>g) It should have Automatic Fetal Movement detection.</li> <li>h) It should have a built-in memory.</li> <li>i) It should have display modes of Trend mode, Number mode &amp; Graph mode.</li> <li>j) Digitally controlled feather touch key operated volume control.</li> <li>k) It should have alarm functions in all movement</li> <li>l) It should have adjustable print speed of 1, 2, 3 cm/min.</li> <li>m) It should have automatic paper feeding function.</li> <li>n) FHR range should be 50-240 bpm</li> <li>o) Should have resolution of 1 bpm</li> <li>p) Transducer frequency should be 1 MHz.</li> <li>q) It should have a battery backup of 12+ hours.</li> <li>r) Should operate at power input to be 220-240VAC, 50Hz fitted with Indian plug.</li> <li>s) It should have an on-device display for real-time monitoring.</li> <li>t) It should have provision for Twin Fetal Monitoring system.</li> <li>u) Belts provided should be durable and of comfortable non allergenic material.</li> <li>v) It should have software features enabling advanced data visualization and analysis.</li> <li>w) Should be provided with trolley.</li> </ul>

## Certifications

Quality certificate

USFDA /CE

Electrical Certification

IEC-60601-1

## Scope of supply

NST machine 1

US (FHR) probes 4

TOCO probe 2

Thermal Print paper 100 rolls

Power adapter &amp; cord 2

Probe belt 10

Stabilizer 1

Trolley 1

*Shree*

Dr. SANKU AGARWAL  
 Director  
 Dept. of Obstetrics & Gynaecology  
 K.G. Medical University  
 Lucknow

*Misra*

Dr. Devyani Misra  
 Professor Junior Grade  
 Department of OBGYN  
 R.P.G.M.C.S.R.H., Dr. R.M.L.I.M.S.

*P.K. Das*

Head of The Dept. of Gynaecological Oncology  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. R.M.L.I.M.S., Lucknow

Future up gradation required

Should be upgradable for Central Monitoring and Remote Viewing Capabilities.

Head of Technology  
Gynaecology  
K.G. Medical University  
Uttar Pradesh, Lucknow

*[Signature]*  
Dr. Devyani Misra  
Professor Junior Grade  
Department of OBGYN  
RPGMCSRH, Dr. RMLIMS

*[Signature]*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

*[Signature]*  
Dr. SHAILY AGARWAL  
Professor  
Dept. of Obs. & Gynaecology  
RPGMCSRH, Dr. RMLIMS, Lucknow

## Vaginal Delivery Set

S. No.	Technical Specifications	Qty.
1.	Towel Clamp 85mm	4
2.	Braun-Stadler Episiotomy Scissors 145mm	1
3.	Bonney Dissecting & Tissue Forceps 1/1; 175mm	1
4.	Collins Haemostatic Forceps 170mm	4
5.	Crile-Wood Needle Holder Serr. 145mm	1
6.	Mayo Scissors Curved 140mm	1
7.	Umbilical Cord Scissors 105mm	1
8.	Sims Vaginal Speculum 70x26mm/75x30mm 125mm	2
9.	Sims Vaginal Speculum 80*36*mm/90*40mm 175mm	1
10.	Kidney Tray Stainless Steel 250mm	1
11.	Laboratory Dish 11.1*7.2*5.6cm 0.4 L/Bowl	1
12.	Laboratory Dish 21.1*14.5*9.6cm 2.5 L/Bowl	1
13.	Instrument Tray with Lid 300x250x50mm	1
14.	Debaquey Curved Tissue Forceps 150mm Tip 2mm	1
15.	Kocher-Ochsner Clamp 160 mm St 1x1t	2
16.	Pean Haemostatic Forceps 140mm	2
17.	Forceps Sponge holding, Foerster, Straight, 250mm	1

## Certifications

Quality certificate  
USFDA / CE / BIS / ISO

## Scope of supply

4 sets of instruments

*Dr. Shyam*  
DR. SHYAM AGARWAL  
Professor  
Dept. of Obst. & Gynaecology  
K.G. Medical University  
Lucknow

*Dr. Devyani*  
Dr. Devyani Mishra  
Professor Junior Grade  
Department of OBGYN  
RPGMCSRH, Dr. RMLIMS  
Head of the Deptt.  
Of Gynaecological Oncology  
K.G. Medical University  
Uttar Pradesh, Lucknow  
*P.K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**Vaginal Examination Set**

S. No.	Technical Specifications	Qty.
1.	Instrument Tray with Lid 150x100x25mm	1
2.	Laboratory Dish 0.060 L 61*42*32	1
3.	Sims Vaginal Speculum 75x30mm&80x35mm 153mm	1
4.	Sim's Anterior Vaginal Wall Retractor	1
5.	Cusco Standard Vaginal Speculum 80x32mm	1
6.	Forester Ballenger Forceps 180mm	1

**Certifications**

Quality certificate  
CE or BIS or ISO

**Scope of supply**

4 sets of instruments

*Signature*  
Dr. RANJAN KUMAR  
Prof. Dr. Ranjan Kumar  
Dept. of Obs. & Gynaecology  
RPGMCSRH, Dr. RMLIMS

*Signature*  
Dr. Devyani Misra  
Professor Junior Grade  
Department of OBGYN  
RPGMCSRH, Dr. RMLIMS

*Signature*  
Head of The Deptt  
Of Gynaecological Oncology  
K.G. Medical University  
Uttar Pradesh, Lucknow  
Prof. P.K. Das  
Professor & Head  
Dept. of Anesthesiology & CCM  
Dr. RMLIMS, Lucknow

## GLUCOMETER

- Should be a hand held meter
- Should required no routine maintenance
- Should have reading range/linearity from 20 to 600 mg/dl
- Should have a maximum reading time of less than 10 seconds
- Should use electrochemical technology
- Should have a LCD display
- Should use a minimum blood sample less than 1.51.d
- Should have measuring unit in mg/dl
- Should have wide operating temperature
- Should have a minimum memory of 50
- Should have life time replacement offer
- Should have easy code entry technique
- Battery should be replaceable without using any tools.
- Should have facility to ensure accuracy of measurements
- Should be supplied with three types of control solutions of each at least 20 ml

### Quality certificate

- USFDA or CE or BIS

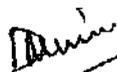
*Shashi*  
**Dr. SHASHI AGARWAL**  
 Professor  
 Dept. of Gyn. & Obs.  
 G.B.P.A. Hospital, Lucknow

*Misra*  
**Dr. Devyani Misra**  
 Professor Junior Grade  
 Department of OBGYN  
 RPGMCSRH, Dr. RMLIMS

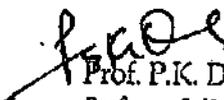
*P.K. Das*  
 Head of The Deptt.  
 Of Gynaecological Oncology  
 K.G. Medical University  
 Uttar Pradesh, Lucknow  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**GLUCOSE STRIPS**

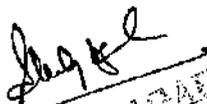
- Should be able to use capillary blood samples
- Should have a minimum 4 months shelf life after opening the strip vial.
- All strips should have at least one year expiry date from the date of supply.
- 50 strips should be supplied along with the equipment.
- Strips should be available In the local market.



**Dr. Devyani Misra**  
 Professor Junior Grade  
 Department of OBGYN  
 RPGMCSRH, Dr. RMLIMS



**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow



**Dr. SEALY ADHIKARI**  
 Professor  
 Dept. of Obst. & Gynaecology  
 G.S.V.M. Medical College  
 Kanpur



**Head of The Deptt.**  
**Of Gynaecological Oncology**  
**K.G. Medical University**  
**Uttar Pradesh, Lucknow**

## HEAD LAMP

## TECHNICAL SPECIFICATION:

- To provide pure white cool light with variable light intensity up to 50,000 Lux for minor OT; critical care and emergency areas.
- The light should be on a floor stand.
- Extremely flat, the compact dome with two handles with innovative with a minimum of 12 LED's.
- Having tubular vertical support with counter balanced spring arm (approx. reach 6.5 ft.) moving up and down and having mobile anti static lockable 4 wheels stand.
- Light head made of durable polycarbonate /aluminium and has one sterilizer handle.
- Light head having smooth and clean surfaces that are easy and safe to clean.
- No heat emission through IR radiation.
- Having push button type control for light intensity variation between 20,000 to 50,000 lux.
- Colour temperature: between 4000k- 5500k
- Colour rendering index (CRI) of a minimum of 90
- Life span of the main light source is not less than 30,000 hours
- Supply voltage: 240 VAC, 50 Hz Single phase easily connectable to hospital emergency power supply in the event of AC power supply failure.
- The unit should be supplied with a minimum warranty of 5 years after successful installation. The warranty must cover every part of the equipment

## Quality certificate:

- USFDA or CE

The equipment should be designed to comply with existing international standards in terms of safety and performance i.e. ISO9001/ISO 13485, IEC60601 and UL Standard.

Having EMI/EMC testing EN60601-1-2-2001 -electromagnetic compatibility

*Signature*  
 Dr. ANANYA AGARWAL  
 Professor  
 Dept. of Gynaecology & Obstetrics  
 K.G. Medical University  
 Lucknow

*Signature*  
 Dr. Devyani Misra  
 Professor Junior Grade  
 Department of OBGYN  
 RPGMCSRH, Dr. RMLIMS

*Signature*  
 Head of The Deptt.  
 Of Gynaecological Oncology  
 K.G. Medical University  
 Uttar Pradesh, Lucknow

*Signature*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCU  
 Dr. RMLIMS, Lucknow

## HIGH DEFINITION LCD MONITOR

- High resolution TFT / LCD medical grade monitor of minimum 21-inch size or more.
- System should have latest processor with 8GB or more RAM and 2TB or more storage capacity Post- acquisition image processing, viewing, reprocessing, hard copy documentation and onwards transmission should be possible.
- Image processing functions like annotation, measurement, rotate, mirroring, zoom, move, windowing filter should be possible; edge enhancement, noise reduction, and contrast enhancement facility should be available

### Quality certificate

- USFDA or CE or BIS

### Electrical Certification

- IEC 60601

*Dr. Shaily*  
**Dr. SHAILY AGARWAL**  
 Professor  
 Dept. of Gen. & Gynae.  
 K.G. Medical University  
 Lucknow

*Misra*  
**Dr. Devyani Misra**  
 Professor Junior Grade  
 Department of OBGYN  
 RGMCSRH, Dr. RMLIMS

*Prof. P.K. Das*  
 Head of The Deptt.  
 Of Gynaecological Oncology  
 K.G. Medical University  
 Uttar Pradesh, Lucknow  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## LABOUR TABLE

### TECHNICAL SPECIFICATIONS:

Delivery Bed Should have following essential specifications:

- Overall size 2100-2400 mm L. when extended, 900mm-1100 mm W (with and without side rails up), 440 mm to 900 mm H (without mattress).
- Bed should have three section high pressure laminated top. It should have detachable laminated top for middle section and leg section for ease of cleaning. Leg section should be telescoped under backrest for lithotomy position.
- It should have control devise for making height and back adjustments. [Manual as well as remote control].
- Frame should be made of mild steel which should be pre treated and powder coated.
- Bed shall have swing down type side railings; railings shall be made from non-rusting polymer moulded material.
- It should have three sectional mattress and seat section should have large perineal cut.
- Mattress should be made of high resilience high quality P.U foam with stain resistant cover and zip.
- Should have a pair of bearing down patient hand grips with PVC covers and with location adjustability for patient convenience.
- All positions should be operated by electromechanical adjustment through a hand set; battery backup with inbuilt battery charger should be provided. The hand set should have indications for power on and the battery charge.
- It should have polymer moulded easily detachable head and foot side panels. It should have four corner rubber buffers.
- Bed should be mounted on 12-cm-15 cm non rusting castor wheels with locking mechanism. Castor should be made from high grade non floor staining synthetic material. Wheel center should have precision ball bearing to run smoothly.
- Should have infusion rods which have adjustable heights, quick release and attaches to all corners of bed.
- Should have a pair of upholstery aluminium crutches mounted on SS tubes.
- Should have sliding waste collection bowl at perineal part of table.
- It should be able to give trendelenburg, reverse trendelburg and 60-70 degree sitting position both mechanically and electronically.
- It should have adjustable foot supports for nursing staff.
- All consumables required for installation and standardization of system to be given free of cost.
- Shall meet IEC-60601-1-2:2001 (Or Equivalent BIS) General Requirements of Safety for Electromagnetic Compatibility. Or should comply with 89/366/EEC; EMC-directive.
- The unit shall be capable of operating continuously in ambient temperature of 10-40 deg C and relative humidity of 15-90%.

*Shalini*  
 Dr. SHALINI AGARWAL  
 Professor  
 Dept. of Obs. & Gynaecology  
 K.G. Medical University  
 Lucknow

*Dévyani*  
 Dr. Dévyani Misra  
 Professor Junior Grade  
 Department of OBGYN  
 RPGMCSRH, Dr. RMLIMS

*P.K. Das*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

*U*  
 Head of The Deptt.  
 Of Gynaecological Oncology  
 K.G. Medical University  
 Uttar Pradesh, Lucknow

- The unit shall be capable of being stored continuously in ambient temperature of 0-50deg C and relative humidity of 15-90%.
- Power input to be 220-240V AC, 50Hz fitted with Indian plug.
- UPS of suitable rating with voltage regulation and spike protection for 60 minutes back up
- Comprehensive training for lab staff and support services till familiarity with the system.
- Comprehensive warranty for 2 years and 5 years CMC after warranty including UPS.
- Electrical safety conforms to standards for Electrical Safety IEC 60601-2-38
- Particular safety requirements for Electrically operated hospital beds.
- User/Technical/Maintenance manuals to be supplied in English.
- List of Equipments available for providing calibration and routine Preventive Maintenance Support as per manufacturer documentation in service/technical manual.
- Certificate of calibration and inspection.
- Compliance Report to be submitted in a tabulated and point wise manner clearly mentioning the page/para number of original catalogue/data sheet. Any point, if not substantiated with authenticated catalogue/manual, will not be considered.
- List of important spare parts and accessories with their part number and costing.
- Log book with instructions for daily, weekly, monthly and quarterly maintenance checklist. The job description of the hospital technician and company service engineer should be clearly spelt out.

**Quality certificate:**

- USFDA or CE or BIS

*Same*

Dr. SHALY AGARWAL  
 Professor  
 Dept. of Obstetrics & Gynaecology  
 RMLIMS, Lucknow

*Dr. Misra*

Dr. Devyani Misra  
 Professor Junior Grade  
 Department of OBGYN  
 RGMCSRH, Dr. RMLIMS

*P.K. Das*

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

*ll*  
 Head of The Deptt.  
 Of Gynaecological Oncology  
 K.G. Medical University  
 Uttar Pradesh, Lucknow

## LARYNGOSCOPE

### TECHNICAL SPECIFICATION:

- Should supply 4 different size standard blades and one handle for adult and pediatric separately and one short stubby handle
- Should be stainless steel matt finished
- Should provide curved blades for both adult and pediatric
- An extra large blade should be supplied along with each scope
- Should be provided with a battery
- Should provide spare bulbs - atleast 6

### Quality certificate:

- CE/ BIS / ISO

*Shaly*  
**DR. SHALY AGARWAL**  
 Professor  
 Dept. of OBGYN  
 RGMCSRH, Dr. RMLIMS

*Devyani*  
**Dr. Devyani Misra**  
 Professor Junior Grade  
 Department of OBGYN  
 RGMCSRH, Dr. RMLIMS

*P.K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

Head of The Deptt.  
 Of Gynaecological Oncology  
 K.G. Medical University  
 Uttar Pradesh, Lucknow

## STERILIZER

SNO	Equipment Specification
1	Double Door Horizontal Rectangular Steam Sterilizer 432 Litres.
A	Operating parameter
	Operating Pressure 34 PSI
	Operating Temperature 134°C
	Vacuum 20-24" Hg
B	Quality compliance
	NABH Norms Compliance
	BIS 3829 Part 1
	Indian BD Test: Air Removal & Steam Penetration Test Compliance
	European BD Test: EN-285 (EN ISO 1 1140-1+4 7 KG Test) Compliance
	American BD Test: AAMI/ANSIST79 (ISO 1 1140-1+5 4 KG Test) Compliance
	Biological Testing
	Test Strip all Classes
C	Features required
	Single Sheet Chamber Fabrication
	Gasket Groove for Silicon Gasket long life
	Maximize Loading Capacity design
	Minimize Electric, Water and maintenance cost
	Completely Pneumatic Valve Control System
	Sterilizer Sealing with Teflon / Silicon or better material for long service life
D	Chamber:
	Triple Walled Rectangular design
	SS 316 quality heavy duty chamber design
	Single Sheet Chamber Design for long working life
	Maximum Chamber utilization by minimum curb design.
	Mirror Polish surface for preventing water deposit
	Chamber design with a 2 % Slope for full draining of the condensate
	Baffle For effective distribution of steam throughout the chamber & to avoid the entering steam from directly hitting the load.
	Front Panel S.S. 304 for Controlling and Operational Parameter Display by HMI Gauges.
E	Jacket:
	SS 304 quality heavy duty Jacket design
	40-50 mm jacket for maximum storage of steam
	Resin Bonded High-Density insulation to minimize thermal loss.
	Heavy gauge S.S. 304 insulation covering
F	Boiler:
	High-Pressure Boiler with thermal insulation for heat loss recovery.

*Dr. Sanyal*  
**Dr. SANYAL ASHUTOSH**  
 Professor  
 Dept. of OBGYN  
 RGMCSRH, Lucknow

*Dr. Deyani*  
**Dr. Deyani Misra**  
 Professor Junior Grade  
 Department of OBGYN  
 RGMCSRH, Dr. RMLIMS

*Dr. P.K. Das*  
**Prof. P.K. Das** Head of The Deptt.  
 Professor & Head of Gynaecological Oncology  
 Dept. of Anaesthesiology & CCU  
 Dr. RMLIMS, Lucknow  
 K.G. Medical University  
 Uttar Pradesh, Lucknow

	Dual site heating element one for working and other for emergency planning (Single Side Heating Element)
	Dual sensor low water cut off device for heaters extra precautions.
	St. Steel Water Level Indicator with graduated marking
	Stainless Steel Heating Element
G	Door:
	Hinge Type Door.
	Door made of SS 316
	Flat Door Design inside for maximum space utilization.
	Heavy Duty Door Design
	Door with Gasket Slot for long service life
	High Accuracy Mechanical Door Safety inside door Plate
	Silicon & Teflon Sealing Door Plate
	Joint less Silicon Door Gasket
	Heat Loss Insulation Door
	Special Covering for preventing burning issue
	S.S. 304 radial arms duly polished
	Smooth operating door
H	Stand:
	Square / Round Heavy-Duty Stand
	Powder Coated
	Height adjuster shoe for Label setting.
I	Control panel:
	Programmable Logic Controller
	Touch Screen Panel (HMI)
	Fully Auto & Manual Control System for Emergency use.
	Emergency Stop Button
	Panel with Siemens/Schneider/L&T product design.
	Dual Pressure Control System
B	Vacuum system:
	Water Ring Type Vacuum Pump with 20"-24" Hg vacuum capacity
	Stainless Steel 304 Condenser for steam condensate
	S.S. 304 Vacuum Pipeline
C	Online feedin s stem:
	High-Pressure online water feeding pump
	Water Feeding without distribution of Pressure & Temperature.
	Back-to-Back Continuously Sterilizer operation
	Heating Element Safety Device
D	Fresh air supply :
	HEPA Filtered air supply accuracy .3 Microns.
	Hot Air supply by Jacketed forced convection System
	Pneumatic Control Air Supply.
	S.S. 304 Pipeline

*Shaly*  
**Dr. SHALY AGARWAL**  
 Professor  
 Dept. of O.G. & G.  
 RMLIMS, Lucknow

*Mirza*  
**Dr. Devyani Mirza**  
 Professor Junior Grade  
 Department of OBGYN  
 RPGMCSRH, Dr. RMLIMS

*P.K.D*  
**Prof. P.K. Das**  
 Professor & Head  
 of Anaesthesiology & CCM  
 RMLIMS, Lucknow

*U*  
**Head of The Dept.**  
 of Gynaecological  
 K.G. Medical University  
 Lucknow

E	Pneumatic control system:
	Pneumatically actuated angle valves with threaded connections.
	Jacket to Chamber steam controlling
	Vacuum Line Control
	Exhaust Line Controlling
	Fresh Air Injecting to Chamber
	Online Water Feeding
	Auto water Line Control
F	Sterilizer sealing
	Door Sealing with joint-less Silicon rubber gasket
	Boiler Plate sealing with Teflon Gasket
	All Pipeline connector seal with Teflon or "O"ring
	Low Water cut-off device sealing with Teflon Gasket
	Water Level Glass Gauge sealing with dye mold silicon rubber
G	Automation software features:
	7 Standard program and unlimited recipe designable
H	3 label passwords protected the controlling system
	Online Trends of operational parameter display in the screen panel
	Bowie Dick Test, Vacuum Leak Testing, and all parameter manual testing facility
	Process control valve operation display
	User ID and Institutional detail display and printing facility
	Fault Diagnostic system available in TFT Display.
	Operation Data recording facility.
	Inbuilt Real Time Clock with Date & Time Function.
	Batch Printing Facility. With facility to save the last cycle data.
	Cloud monitoring System
I	Inbuilt Accessories:
	S.S. 316 Pressure Gauge range 0 to 60 psi with accuracy $\pm 0.5\%$
	S.S. 316 Compound Gauge range -30 to 60 psi with accuracy $\pm 0.5\%$
	S.S. 316 Temperature Gauge range 0 to 300 °C with accuracy $\pm 0.5\%$
	High Accuracy Safety Valve with accuracy $\pm 3$ PSI in entire range
	Door Locking Plate Accuracy +1 PSI on set point of 5 PSI
	Thermostatic Control Steam Trap
	Bucket Type Float Valve for minimum steam loss and better temperature
	Thermostatic Steam Trap for jacket air removal
	Low Water Pressure Control System

*Setup*  
 Dr. BRAJY AGARWAL  
 Professor  
 Department of OBGYN  
 RGMCSRH, Dr. RMLIMS  
 Lucknow

*Misra*  
 Dr. Devyani Misra  
 Professor Junior Grade  
 Department of OBGYN  
 RGMCSRH, Dr. RMLIMS  
 Lucknow

*U*  
 Head of The Deptt.  
 Of Gynaecological Oncology  
 G. Medical University  
 Uttar Pradesh, Lucknow

*P.K. Das*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

	Low Air Pressure Control System
	Single Phase Preventer
	High Accuracy Control Pressure Switch for accurate pressure control
	Door interlock to prevent the simultaneous opening of both doors.
J	Mountin & control panel: M.S. Powder Coated Control Panel
	The sterilizer should be mounted on a Tubular M.S. Powder Coated Stand
K	Manual Control: The control system should provide Manual Control in case of PLC failure. Here all process should be operated with the help of Manual Control Switches.
L	Quality Control: Chamber Hydraulic Test Certificate Jacket Hydraulic Test Certificate Pressure Safety Valve Vacuum Safety Valve Door Plate Operating Accuracy Pressure Gauge Accuracy Test Certificate Compound Gauge Accuracy Test Certificate Temperature Gauge Accuracy Test Certificate
M	Quality Control Certificates: US FDA/European CE certified with four digit notified body number / BIS 3829 Parts -1
N	ISO Certificate ISO 13485:2016 Certificate CE Certificate IEC 61010-1:2010 Certificate ISO 14001:2015 Certificate ISO 45001 :2018 Certificate
O	BS EN ISO 17665-1:2006 Certificate BS EN 285:2015 Certificate S are Parts with each Sterilizer: 3 Heating Element 2 Nos. Seamless Silicone Gasket 2 No. Pneumatic Control Valve 2 Nos. Pneumatic Control Valve
P	Accessories optional S.S. Material Un-loading Trolley 2 Nos. Each Sterilizer SS 304 Material Loading Carriage 1 No. Each Sterilizer Panel Mounted Printer

*Signature*  
Dr. SHALY AGARWAL  
Professor  
Dept. of Obst. & Gynaecology  
RPGMCSRH, Dr. RMLIMS  
Lucknow

*Signature*  
Dr. Devyani Misra  
Professor Junior Grade  
Department of OBGYN  
RPGMCSRH, Dr. RMLIMS

*Signature*  
Head of The Dept.  
Of Gynaecological Oncology  
K.G. Medical University  
Uttar Pradesh, Lucknow

*Signature*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
RMLIMS, Lucknow

## HYSTEROSALPHINGOGRAM CANNULA

- Should be made high-grade stainless steel.
- Quality steel should comply with international medical standards.
- It should be for high quality and precision.
- It should be lightweight, strong, and durable.
- It should come in 3 cone sizes.
- The tungsten carbide (TC) inlay should be nickel-based.
- The TC inlay should be welded to the instrument and not pasted.
- Spares/consumables should be available for a period of at least five years & more after the expiry of the guarantee/warranty period.
- The firm must attach a list of installation and also provide performance certificates in the last 5 years of Central Govt./state govt./reputed private hospitals.
- System configured application-specific educational video tutorials shall be provided as standard with the system

## Quality certificate:

- USFDA or CE or BIS.

*Shruti*  
**Dr. SHRUTI AGARWAL**  
 Professor  
 Dept. of Obs. & Gynaec.  
 R.P.G.M.C.S.R.H., Dr. RMLIMS

*Misra*  
**Dr. Devyani Misra**  
 Professor Junior Grade  
 Department of OBGYN  
 R.P.G.M.C.S.R.H., Dr. RMLIMS

*P.K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

*V*  
**Head of The Deptt.**  
**Of Gynaecological Oncology**  
**K.G. Medical University**  
**Uttar Pradesh, Lucknow**

**Medicine**  
**Cardiology**

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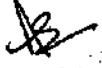


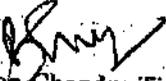
Technical Specifications  
related to Department of Medicine/ Cardiology by  
committee members

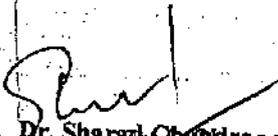
SR. NO.	NAME OF EQUIPMENT	GO NUMBER	APPROX. COST
1.	CATH LAB	GO-I/112605/2021	8 - 9 CRORE
2.	HIGH END ECHOCARDIOGRAPHY MACHINE	GO-28-DEC-17 SUCHI-1	1.5 - 2.0 CRORE
3.	HOLTER (MONITORING SYSTEM WITH RECORDER)	GO-7-DEC-2022	25 LACS
4.	ECHO MACHINE (PORTABLE COLOUR DOPPLER SYSTEM WITH ECHO PROBE)	GO-7-DEC-2022	50 LACS
5.	TMT MACHINE (COMPUTERISED STRESS TEST SYSTEM)	GO-I/112605/2021 GO-7-DEC-2022 GO-7-DEC-2022	50 LACS
6.	AMBULATORY BLOOD PRESSURE MONITOR	GO-7-Dec-2022 GO-7-Dec-2022	6 LACS
7.	PULSE GENERATOR (TEMPORARY PACEMAKER)	New Addition	3.5 LACS

This is to certify that technical specification of all the above-mentioned machine/instruments, approved by the technical committee is not of any specific company. The technical features of the equipment/instruments from all reputed firms in the current market have been included in this specification to the best of my knowledge and belief & in the opinion of the technical committee.

The technical specification duly signed by the technical committee members is attached herewith.

  
Dr. Anubha Srivastava  
Professor  
Medicine Department  
M.L.N. Medical College, Paljora  
S.R.N. Hospital, Allahabad

  
Dr. Bhuvan Chandra Tiwari  
Professor  
DR RMLIMS, Lucknow

  
Dr. Sharad Chandra  
Professor  
MD, DM, FESC, FACC, FSCAI  
KGMU, Lucknow  
Deptt. of Cardiology, KGMU, Lucknow

  
Prof. P.K. Das  
Chairman  
Technical specifications committee  
Clinical Subjects & others  
Head, Department of Anesthesiology & CCM  
DR RMLIMS, Lucknow

Cath Lab

	<b>Requirements</b>
	Top of the line dedicated Digital Flat Panel detector, Single-Plane Cardiovascular Catheterization Laboratory system for advanced Cardiovascular Diagnostic and Interventional Procedures including coronary, valvular, congenital, peripheral procedures along with accessories on turnkey basis.
A.	<b>GANTRY:</b> Floor/Ceiling Mounted with Mattress, Gantry Rotation/angulations: LAO/RAO At least 100/100 degrees, Cranial/Caudal $\pm$ 45 degrees.; Speed of Rotation: Cranial/Caudal and LAO/RAO: 15° deg/sec or higher. Non-contact sensing mechanism, to prevent patient collision. Whole body head to toe coverage without repositioning patient, with facility for rotational angiography
B.	<b>PATIENT SUPPORT TABLE</b> Floating/Floor mounted with carbon fiber tabletop with easy patient transport & pivot capability, long length, and broad enough to support hand. along with arm support aids to facilitate radial procedures.
C.	<b>X-RAY GENERATOR</b> should be of latest technology with high frequency type with at least 100 KW generator.
D.	<b>X-RAY TUBE:</b> Focus: Dual, Anode Heat: 3.3 MHU or higher Capacity. Maximum heat dissipation capacity of at least 1500 W, Advanced cooling system (oil or water-cooled) to ensure continuous operation. Latest generation tube, fluoroscopic power shall be at least 2500 watts for noise less operation to support long term interventional procedures & for better visibility in obese and deep angulations. The system should be able to run for 6 hrs continuously without shut off. Should have computer controlled X-Ray beam filtering with at least 3 sizes of CU filters for fluoro and acquisition and should have collimator with square/rectangular configuration.
E.	<b>IMAGING:</b>
1.	Flat detector of at least 10" diagonal size, high spatial resolution, capable of acquisition, processing, storing display and review in at least 1024 X 1024 matrix
2.	Flat Panel detector system with excellent spatial and contrast resolution with at least 3 zoom fields with DQE of at least 70%
3.	Acquisition; speed of up to 25 frames per sec. Acquisition speed for DSA should be 0.5 frames/sec to 6 frames/sec or higher
4.	Detector quantum efficiency at least 70%
5.	System should have on-line & off-line validated coronary analysis, ventricle analysis programme.
6.	The system should have full table-side control operation with complete acquisition and post processing capabilities.
7.	System should automatically transfer image to PACS system.
8.	Complete Stent-enhancement package including Stent enhancement with lumen subtraction facility should be offered. Real time live stent enhancement package should be offered as standard
9.	The software and hardware for visualizing stent (stent enhancement capability) with extra high-resolution from table side control.
10.	Digital fluoroscopy 14 bit or higher. Fluoro grab/ save and replay facility. Ability to store fluoro and store in series with the cine images should be included.
11.	Complete cardiovascular computation software package. This should include

Prof. Sharad Chand  
MD, DM, FESC, FACC, FSC  
Dept. of Cardiology, KGMU

Professor  
Medicine Department  
W. N. Medical College &  
W. N. Hospital, Varanasi

Dr. Bhuvan Chandra Tripathi  
Professor & HOD  
Department of Cardiology  
Dr. R.M.L.I.M.S., Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

	validated coronary, ventricular quantification software packages (QCA, LVA).
12.	Digital rotational angiography facility at a speed of 40 degree/sec, or more with acquisition frame rate up to 25 frames/sec, in 1k matrix with facility for dynamic display of subtracted images in 1024 matrix should be available.
13.	DICOM 3 ready and PACS connectivity should be feasible.
14.	The system must be latest and should include advanced software/hardware packages of image processing like dose wise Auto Right or equivalent.
15.	Joy-stick or knob button to move the table should be sturdy and should not have complaints of frequent damage from centers where cath lab has been installed.
F.	<b>LCD/TFT image monitors</b>
1.	55 inches or bigger, medical grade widescreen display monitor (one in number) with split screen for live with, reference, DSA, Roadmap, stent view and patient parameters. With two additional 19" back up display in examination room.
2.	2 independent DICOM workstations with at least 19" Monitor for reviewing the image of ongoing patient without disturbing operator - one in control room and one in side room for reviewing of daily angiograms with capacity to review 2500 procedures with atleast 1 TB HDD and CD and DVD writer for writing for patient and keeping record in department.
3.	Examination room monitors mounted on a ceiling suspension to allow free positioning at any location with adjustable height.
G.	<b>Essential accessories.</b>
1	Foot Switch for fluoroscopy and acquisition to be provided.
2	Compatible pressure injector to be offered with system. (Medred or equivalent) with 100 syringes for pressure injector.
3	Focused ceiling mounted light with handle for positioning the light. This handle should be removable.
4	Ceiling suspended radiation protection shield of largest size should be provided for radiation protection.
5	Additional table mounted radiation shields to be provided.
6	Each door leading to cath lab should be lead reinforced.
7	Lead glass in interface of cath lab and console should be at least 4 X 7 Feet
8	<b>ACT Machine.</b> One in number.
9	Scrub for hand washing with two taps with sensor control and foot paddle control, and provision for hot water with geyser, all should be of standard company.
10	Suitable UPS capacity of 120 KVA including Cath Lab and accessories for at least 30 minutes full back up for the system
11	Complete hemodynamic recorder with IBP module, pulse oximeter module, ECG module, SPO2 module : 12 channel ECG, 4 numbers of invasive pressure transducers, SPO2 with plethysmographs 2 in numbers, temperatures probes - 2 numbers, dp/dt one channel. Full-hemodynamic analysis. It should have the following features ; 1) network printer for printing high quality traces, 2) high resolution medical grade more than 19 inches monitor ( 2 in number) in console room , separate for recording and printing and display in examination room should be provided.
12	Joystick control should be provided for from table side to make system movements and touch screen for selecting X ray settings, measurements, etc.
13	Advanced low radiation safety features/package for safety of patients and operators available in tube/ system to reduce radiation exposure.

Prof. Sharad Chandra  
MD, DM, FSC, FACC, FSCAI  
Deptt. of Cardiology, KGMU, Lko

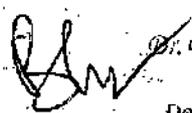
Professor  
Medicine Department  
M.L.N. Medical College &  
S.R.N. Hospital, Allahabad

Dr. Bhavendra Chandra Tripathi  
Professor & HOD  
Department of Cardiology  
Dr. R.M.L.I.M.S., Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

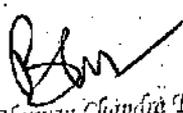
14	OCT/IVUS co-registration ready for integration.
15	12 complete lead apron set (each set should include 1 skirt and vest type design of lead apron with thyroid shield and lead glass) of standard company, and head cap for radiation protection.
16	Suitable lead hanger stand and hangers for 12 lead apron.
<b>H.</b>	<b>ENVIRONMENTAL FACTORS</b> The unit shall be capable of operating continuously in ambient temperature of 0 – 50 deg C and relative humidity of 15-90%. The unit shall be capable of being stored continuously in ambient temperature and relative humidity of 15-90%; Shall meet IEC-60601-1-2: 2001 (Or Equivalent BIS) General Requirements of Safety for Electromagnetic Compatibility.; The chosen supplier would be asked to undertake a turnkey project where necessary civil work modifications like False ceiling, Anti-skid flooring and finishing works would be provided by them. The supplier would provide suitable addition of air condition for proper and effective running of Cath lab. The supplier also would provide necessary furniture like tables, computer chairs, cupboards, catheter hang wall mount etc.. Lead doors for all passage ways leading out of cath lab. And lead glasses for all windows. Proper shielding should have to be done by the supplier to minimize radiation leakage as per AERB and BARC regulations.
<b>I.</b>	<b>Power Supply</b> Power input to be 220-240VAC (Single Phase), /400-440 V (3 Phase)/ 50Hz as appropriate fitted with Indian plug; Reset table over current breaker shall be fitted for protection; Full System Online UPS of suitable capacity shall be supplied for the entire cath lab system including X-ray generation with a minimum power back up of 30 minutes.
<b>J.</b>	<b>Documentation</b> User manual in English; Service manual in English; List of important spare parts and accessories with their part number and costing; Certificate of Calibration and inspection from the factory; Log book with instructions for daily, weekly, monthly and quarterly maintenance checklist. The job description of the hospital technician and company service engineer should be clearly spelt out. List of Equipments available for providing calibration and routine maintenance support as per manufacturer documentation in service / technical manual. User List and performance certificate of at least 5 cath labs installation in the past five years from government institutions should be submitted along with the technical bid.
<b>K.</b>	<b>Guarantee &amp; Warranty :</b>
1	Comprehensive warranty for 5 year for the complete system including x-ray tube, all spare parts, local items, UPS and air-conditioning system. Quote comprehensive maintenance contract for complete system, AC, UPS including X-ray tube for additional 5 year after expiry of warranty period of 5 years.
2	All steps to be taken to maintain 95% up time of the equipment falling which penalty clause would be imposed.
3	Confirmation of availability of required spares and picture tube for maintenance of the equipment for 10 years from completion of installation to be provided.
4	Service Centre with Service engineer should be available Uttar Pradesh.
5	Supplier should have good service record, should not have bad service history and record for cath lab maintenance, where they have supplied cath lab.
<b>L.</b>	<b>For turnkey</b>
1	Flooring: Vinyl flooring in examination room, UPS & battery room. Vitrified tiles of 600X600mm in console room to be done by the seller. (Make: Kajaria, Somany or equivalent)
2	Wall Finishing: All room walls of Cath lab and console will be finished with painting upto false ceiling as per approved shade by the institute. (Make: ICI, ASIAN or equivalent)

  
Professor  
Medicine Department  
M.L.N. Medical College &  
R.N. Hospital, Allahabad

  
Dr. Bhuvan Chandra Triwari  
Professor & HOD  
Department of Cardiology  
Dr. R.M.L.I.M.S., Lucknow

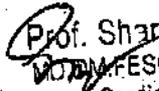
  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

3	False ceiling: Acoustical tile of 600X600mm for ceiling with light weight insulating material of high quality supported on grid or finished seamless with support above ceiling. (Make: Armstrong/ Saint gobain/Tarkett or equivalents)
4	Airconditioning: An adequate capacity of air-conditioning to be provided for proper and effective running of Cath lab. Ductable air conditioners and split AC units may be used according to room requirement and suitability. The air conditioning should be designed with standby provision to function 24 hours a day. The outdoor units of AC should have grill coverings to prevent theft and damage. (Make: Bluestar, carrier or Daikin or equivalent). De - humidifier of adequate capacity should be provided to prevent moisture related damage to cath lab
5	Fire alarm system comprising of Smoke / heat detectors integrated in the ceiling and fire panel will be required. Dry CO2 type Fire Extinguishers (2 in number) will be required. (Agni/equivalent)
6	LAN Networking inside the Cath Lab area to be provided by vendor along with suitable internet switch and main connection will be provided by hospital authorities
7	Vendor should inspect the proposed site before applying for the tender.
M.	<b>Standards and Safety and certifications</b>
1.	Should be <b>USFDA</b> and <b>European CE</b> approved by 4 digits notified body.
2.	Electrical safety conforms to standards for electrical safety IEC-60601-1
3	General Requirements: Manufacturer should have ISO certification for quality standards; Shall comply with AERB and BARC guidelines

  
Dr. Shivam Chandra Triwari  
Professor & HOD  
Department of Cardiology  
Dr. R.M.L.I.M.S., Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anesthesiology & CCU  
Dr. RMLIMS, Lucknow

  
Professor  
Medicine Department  
M.L.N. Medical College &  
S.R.N. Hospital, Allahabad

  
Prof. Sharad Chandra  
MD, DM, FESC, FACC, FSCAI  
Deptl. of Cardiology, KGMU, Lko

### High end Echocardiography machine

Technical Specification	
1.	The system must be Latest generation, Highest end & Technologically advanced Digital 4D (Live 3D) Echocardiography system for Transthoracic and TOE adult & pediatric cardiac applications. Any other model other than the highest end and latest version is liable for rejection.
2.	System must be offered with a minimum of 60,00,00 digital processed channels. Original technical data sheet should be enclosed in technical bid to support the number of channels on the systems. If not mentioned, please attach a letter from manufacturer along with the technical bid clearly stating the digital processed channels of the offered system. 2D Frame rate 2500 frame per second and Dynamic gain 300db
3.	System must have adult and pediatric cardiology transducer with either single crystal technology or pure wave technology or matrix or phased array for excellent grayscale Image quality on Difficult to image patients. Please mention the technology used in the transducer. Original technical data sheet should be enclosed in technical bid to support the technology of probes.
4.	System must be offered with a minimum 22-inch High Resolution OLED/Better Technology Flat Panel Medical Grade Display monitor with multiple/nearly infinite position adjustments. Company should provide wider monitor if available.
5.	System should have at-least four Imaging-active probe ports with electronic-switching facility from keyboard without probe adapter.
6.	System should be capable of supporting latest generation 4D (Live 3D) matrix Transducer capable of supporting a minimum of 2000 elements for exceptional 4D (Live 3D) Echo, 4D (Live 3D) zoom, triggered full volume and triggered 3D color volume with electro-cautery Suppression
7.	System should support broad band probes spanning a frequency of 1-15 MHz $\pm 2$
8.	Image storage facility on in build hard disc & MOD/CD/DVD-RW/SSD facility should be available. 10 TB built/external hard disk/SSD with capacity to store multiple images and videos. System should have extensive image management capability including thumb nail review, Cine loop editing etc.
9.	System must be offered with Speckle Reduction Imaging. Image processing technique to remove speckles and clutter artifacts like tissue boost/ACE or equivalent technology
10.	System should have 4D (Live 3D) Echocardiography capability with Color Flow Imaging
11.	System should be capable of scanning depth of 30 cm or more. Scanning Depth should be clearly mentioned in the technical quote If not mentioned Please attach a letter from manufacturer along with the technical bid clearly stating the scanning depth of 30 cm or more in the offered system.
12.	Should be able to perform advanced quantification measurements like Strain & Strain Rate Quantification. Should Measure the myocardial velocity and derives the strain rate and strain along user-defined M-lines. Capable of drawing up to 3 M-lines at a time. Capable of sub-dividing each m-line into 8 sub-regions or according to user-defined sub-region sizes. Point of Interest tool obtains values from any point on the M-mode display. Automatic LV, LA and RV strain Auto LV and LA 4D volume calculation. In addition to the Tissue Doppler based strain, Layered strain, 3D Circumferential strain, Longitudinal strain, Aortic Valve Quantification, Offline Reporting, Doppler measurement, PW, CW, TVI and TDI Offline measurement of LIMP. System should have 2D Based strain like VVI, AFI and CMQ or similar technology should be offered. These should be offered both on the system and on a licensed workstation. OFF-CART workstation (both licensed hardware and licensed software) should be quoted and highlighted in the technical bid.
13.	2D speckle tracking with latest software and AI. System should have 4d depth rendering technology with light source.
14.	System must be offered with user-friendly high-resolution user interface touch panel of minimum size of 12 inch or intuitive Keyboard. User friendliness will be given preference.

Prof. Sharad Chandra  
MD, DM, FESC, FACC, FSCAI  
Deptt. of Cardiology, KGMU, Lucknow

Dr. Bhiswan Chandra Tiwari  
Professor & HOD  
Department of Cardiology  
Dr. R.M.L.I.M.S., Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Professor  
Medicine Department  
M.L.N. Medical College &  
S.R.N. Hospital, Allahabad

15.	<p>Should be provided with software to be able to perform MPR views for Quantification from 3D Imaging on Volume measurements like LV volumes, Ejection fraction from 3D Image, etc. Also should offer synchronicity indicators to measure and compare timing of maximum contraction of LV volumes. Should display global LV volume and should provide simultaneous display of 17 regional/ Strain volume waveform. Triplane 2D imaging in volume probe for visualising all 17 segments.</p> <p>This should be offered both on the system and on a licensed work station (both licensed hardware and licensed software) should be offered and highlighted in the technical bid. Should be able to perform advanced quantification measurements like Automated strain &amp; CRT quantification. System Should have 4D dynamic LV, RV, LA Volume. The quantification capabilities should be offered OFF-LINE also. The system images should be transferred through DICOM to the OFF-LINE and via networking to licensed workstation. The workstation should have a DICOM Image Management System Software loaded so as to print images through a Color laser printer</p>
16.	The system should have the facility of displaying the three planes of the 3D data set.
17.	<p>Contrast Harmonic Imaging should be offered as standard on the system, with optimization for Low and HI MI applications. Should also have facility of LOW MI with triggered replenishment Imaging.</p> <p>Integrated strain stress Echo facility to perform Stress Echo exams. (Dobutamine &amp; exercise stress echo)</p> <p>All the software related to Valve, chamber Quantification, RWMA (strain and volume) in 3D and 2D. Anatomical M Mode, Auto Doppler measurement, 3DQ, 3Dq Advanced / 4D strain.</p> <p>Contrast and perfusion should be provided.</p>
18.	<p>Should have the state of the art Transmit Real Time Compound Imaging Technology with Multiple transmitted lines of sight, wherein Multiple Coplanar Images from different viewing angles are obtained and combined into a single compound image at real-time frame rates for improved visualization. Should demonstrate and show multiple transmitted lines of sight in linear probes.</p> <p>Latest PC (off-cart workstation) with permanent license software for analyzing and quantification of 2D and 3D data sets like Strain and Strain rate imaging, Tissue Motion Annular Displacement/Tissue Tracking, Mitral valve, Aortic Valve, Left Atrial Appendage measurement in 3D data sets, 2D &amp; 3D Speckle tracking, Reporting, Layered Strain, Mitral valve 3D data sets, 2D-Speckle tracking. CD/DVD writer with Image management software and colour laser Printer. PC should be offered with a flat panel &gt; 21" display monitor. (Hardware essential for OFF cart quantification)</p> <p>2D AI based measurement like LV Study / Auto EF should be offered. Strain Measurement for LV, RV and LA to be offered as standard in the system. System Should be offered with tomographic representation for Mitral Valve, and Aorta.</p> <p>System Should be offered with 4D with up to 12 Slice imaging.</p>
19.	<b>SYSTEM MUST BE SUPPLIED WITH FOLLOWING TRANSDUCERS (Latest Technology should be offered)</b>
	<p>I. 4D (Live 3D) Echo Matrix Transducer for Adult 4D (Live 3D) with frequency ranging from 1-5 <math>\pm</math> 1 Mhz. This probe must support a minimum of 2000 elements for exceptional 4D (Live 3D) image quality on the matrix array transducer to simultaneous display of two real-time live high-quality image planes. This transducer should have either single crystal technology or pure wave technology for excellent Image quality on Difficult to image patient. Please mention the crystal technology used in the transducer.</p>
	<p>II. 1-5 <math>\pm</math> 1 MHz Broadband Adult Echo Transducer for Adult Cardiology imaging. Must have Tissue Harmonic Imaging. Must have either single crystal technology or pure wave or matrix technology for excellent Image quality on Difficult to image patients. Must attach original technical data sheet of transducer to specify the above technology used in the transducer. This adult probe must be of the smallest foot print.</p>
	<p>III. Either one probe with adult 2D &amp; 4D (3D live) capability or two separate probes</p>
	<p>IV. 3-8 MHz Broadband Pediatric Echo Transducer for Pediatric and Cardiology imaging.</p>
	<p>V. 5-12 MHz Broadband Pediatric Echo Transducer for Neonatal Cardiology imaging.</p>

Prof. Sharad Chandra  
M.D., M.E.S.C. FACC, FSCAT  
Dept. of Cardiology, KCMU, Lucknow

Dr. Shivan Chandra Tiwari  
Professor & HOD  
Department of Cardiology  
Dr. R.M.L.I.M.S., Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Professor  
Medicine Department  
M.L.N. Medical College &  
S.R.N. Hospital, Allahabad

	VI. 2D Echo TEE Transducer for Adult with frequency ranging from 2-7 Mhz. customizable TEE probe button with mitral valve analysis package & subsequent software packages for other valves to be provided free of cost.
	VII. Linear transducer for vascular ultrasound 3-12 M Hz + 2
	VIII. All probes must be included in the total machine price.
	IX: At the time of installation, the vendor should provide all the required items (UPS etc) necessary for smooth, proper and safe functioning of the machine. System should be supplied with ONE 3KVA online UPS backup of 30 min minimum, from APC or Emerson or any other standard brand
	X. Latest software for depth rendering etc. should be offered as standard.
20.	System should also be provided with- <ul style="list-style-type: none"> <li>a.) -Latest PC (off-line licensed workstation) with minimum 1 TB Hard drive/SSD, 2x8 GB DDR 3 RAM, Intel i7- 3.5 GHz or higher processor, Two serial port, Minimum 4 USB port, Inbuilt Bluetooth &amp; Wi-Fi, 24" Monitor, Keyboard, mouse, 10 or latest Windows professional or equivalent, licensed software for analyzing and quantification of 2D and 3D data sets, CD/DVD writer with Image Management Software and High End colour laser Printer with auto duplexing should be supplied. PC should be supplied with the licensed software to work on above mentioned tender specifications related to Strain and Strain rate imaging, Semi-Automated Border Detection,</li> <li>b.) Tissue Motion Annular Displacement, Mitral Valve 3D data sets, 2D speckle tracking (any other Hardware essential for OFFLINE Quantification)</li> <li>c.) Latest B/W Thermal Printer with 100 rolls of thermal papers for thermal printer</li> <li>d.) ECG cable: Five in numbers</li> </ul>
21.	Local Service Facility should be available.
22.	Cidex tray for TEE probe
23.	Hanger for TEE probe
24.	Probe cover for physical damage & rodent bite prevention
25.	Guarantee & Warranty: Warranty for 5 years and Comprehensive Guarantee after expiry of warranty for all accessories for Five years including parts and labor as per institute norms. All software updates a period of 5 years to be provided free of cost. CMC should be unconditional and include all accessories and consumables including third party items. Comprehensive Guarantee for parts and labor from year 6 to 10 will also need to be quoted in the price separately and will be taken into account (added in the price bid) while calculating the Final Price. The CMC should be unconditional and include all accessories and consumables, probes, cables and third-party items. In case of technical snag/failure/breakdown the response time for the inspection should be within 24 hours and repair within 05 days otherwise provide a service machine/ alternate arrangement to be made till the period of recovery of the breakdown of the unit, failing which attracts penal action as per the decision of institute/hospital.
26.	Standards and certifications <ul style="list-style-type: none"> <li>a) Should be USA FDA or European CE approved by 4 digits notified body.</li> <li>b) Other necessary certifications if any required will be provided by the bidder for the smooth functioning of the machine.</li> </ul>

Prof. Sharad Chandra  
MD, M.F.E.C., F.A.C.C., F.S.S.A.  
Dept. of Cardiology, KGMU, Lucknow

Dr. Bhuvan Chandra Tripathi  
Professor & HOD  
Department of Cardiology  
Dr. R.M.L.I.M.S., Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Professor  
Medicine Department  
M.L.N. Medical College &  
R.N. Hospital, Allahabad

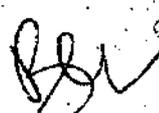
## HOLTER MONITOR

### (HOLTER MONITORING WITH RECORDING SYSTEM)

#### A. SOFTWARE:

The system should have the following software and capabilities as standard

1. The system should work on Licensed Windows software.
2. More than 150 hours of Ambulatory ECG Recording & Analysis Software.
3. ST Measurement software with an ST trend and measurement values.
4. Heart Rate Variability Software with HRV differential histogram, HRV histogram, HRV scatterplot.
5. Colour-coded HRV Power Spectrogram in terms of low power, middle range power, and high-power values.
6. HRV tabular summary should be available.
7. The values of the HRV histogram and HRV differential histogram should be exported to a CSV file.
8. HRV Analysis in time & frequency domain.
9. Pacemaker Analysis should be there with PM-PM histogram, and PM-R histogram and the values of this histogram should be exported to a CSV file.
10. Pacemaker analysis tabular summary should be there with Undefined paced, Fusion, Atrial paced, Ventricular paced Dual-Chamber paced, PM Failed To Capture, PM Failed To Sense, PM Failed To Pace and Total paced data.
11. ECG Template matching software.
12. Should detect P wave accurately for atrial fibrillation screening.
13. Should have specialized Graphical software for detection of the onset of Atrial Fibrillation.
14. Should have Artifact Detection Software and automatic exclusion of artifacts.
15. Should have atrial analysis.
16. Should have QT analysis.
17. Should have RR Interval measurement Beat by Beat.
18. Should have calipers for measurements of time in msec and heart rate and preferably amplitude measurement.
19. Should have apnoea analysis.
20. Should have specialized Graphical representation software to provide information on sleep quality and level of stress.
21. Should have an easy view of ECG of all leads.
22. Should have colored Graphical Representation of QT intervals, PR Intervals, Tachogram (R-R interval) & ST Alteration.
23. Should be able to save the complete test report in PDF format.

  
 Prof. Sharad Chandra  
 MD, DM, FACC, FSCAI  
 Dept. of Cardiology, KGMU, Lko

  
 Dr. Bhuvan Chandra Triwari  
 Professor & HOD  
 Department of Cardiology  
 Dr. R.M.L.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Professor  
 Medicine Department  
 M.L.N. Medical College &  
 S.R.N. Hospital, Allahabad

24. Should be able to send the data via e-mail.
25. System should allow the user to reclassify the complex as well as ECG templates.
26. Should allow the user to make different workflow patterns.
27. Should give the Tabular Summary showing all recorded ECG details.
28. Should have strip marking and strip directory.

**B. Hardware:**

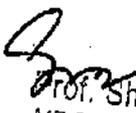
1. Recorder should be compact and lightweight.
2. Weight should not be more than 150gms without a battery. Plus minus 20 %.
3. Should have a sampling frequency of at least 30000 Hz.
4. Should record 3 Channels with 5/7 lead patient cable.
5. The same recorder should have the capability of measuring derived 12 Lead from 3 channels.
6. Should have compatible with adequate capacity of removable Compact flash card & capable of storing up to 150 hours and more of ECG.
7. Data should be transferred/ analyzed via an SD card reader.
8. Should have displayed to check pre-hook-up ECG quality.
9. Should have an option of selecting the resolution of the recording. The maximum resolution of the recording should be 1024 Hz with a storage rate of 1000 Hz: 12 bit.
10. Should detect Apnea, QRS, P Wave.
11. Should have Event Marker/ Patient Marker button on the recorder.
12. Should record for more than 7 days of Holter recording.
13. Should use a suitable AAA battery to record up to 150 hrs of ECG.
14. Should also have an internal rechargeable battery so that if in case the AAA battery depletes internal battery takes over the recording without any break.
15. System should print all the Holter Test Report on Laser Printer on ordinary paper & not on Thermal Chart Paper.

**C. Storage System:**

The system with data storage facility with the following configuration

Windows Licensed Software

1. i 7 Processor
2. 1 TB HDD
3. RM: 4 GB
4. DVD Writer one in number.
5. Cabinet with SMPS
6. 24-inch LCD Touchscreen monitor one in number
7. Black & White Laser Printer one in number
8. Suitable Table for placing data storage system
9. No. of Recorders: 04 Nos.

  
 Prof. Sharad Chandra  
 MD, DM, FESC, FACC, FSCAI  
 Deptt. of Cardiology, KGMU, Lko.

  
 Dr. Shrawan Chandra Tiwari  
 Professor & HOD  
 Department of Cardiology  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Professor  
 Medicine Department  
 M.L.N. Medical College &  
 S.R.N. Hospital, Allahabad

10. No. of Analyser: 1 Nos.

**Certification required**

1. All accessories should be from the same Original Equipment Manufacturer for the main unit.
2. Instruments must be ISO certified and a copy should be enclosed. (The ISO Certificate must be issued by any organization accredited by the Bureau of Indian Standard or accredited by the international accrediting forum "IAF" (Certificate to be attached).
3. Should be USA FDA and/ or European CE be approved by 4 digits notified body.
4. Other necessary certifications if any required will be provided by the bidder for the smooth functioning of the machine.
5. In case of technical snag/failure/breakdown the response time for the inspection should be within 24 hours and repair within 05 days otherwise provide a service machine/ alternate arrangement to be made till the period of recovery of the breakdown of the unit, failing which attracts penal action as per the decision of institute/hospital.

  
 Bhuvan Chandra Tiwari  
 Professor & HOD  
 Department of Cardiology  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Professor  
 Medicine Department  
 M.L.N. Medical College &  
 S.R.N. Hospital, Allahabad

  
 Prof. Sharad Chandra  
 MD, DM, FESC, FACC, FSCAI  
 Dept. of Cardiology, KGMU, Lko.

**Pulse Generator  
(for Temporary Pacing)**

Sr. No.	Technical Specification
1.	Should have touch screen facility for ease of operation and lightweight (less than 700 g)
2.	Should have an additional internal battery back up to facilitate quick change of normal AA battery.
3.	Should be able to be attached easily to the patient arm, IV stand.
4.	Should have rapid atrial pacing to manage atrial flutter safe and reliable.
5.	Should have safety awareness ranges to alert clinicians to areas of caution.
6.	Should have modes AOO, AAI, AAT, VOO, VVI, VVT, DDD, DDI, DVI, DAI, DOO, DDT, VDD, AND VAT.
7.	Should have a basic pacing rate of 30 to 180ppm which is continuously adjustable.
8.	Should have a rapid atrial pacing rate of 40 to 1000ppm.
9.	Should have rapid atrial pacing rate:
10.	40 to 120 ppm in steps of 2ppm increments.
11.	120 to 200ppm in steps of 5ppm increments, 200 to 400ppm in steps of 10ppm increments 400 to 1000ppm in steps of 50 increments.
12.	Should have an output amplitude Atrial 10 – 20 mA and Ventricular: 0.1 – 25 mA.
13.	Should have Atrium pulse width 0.7ms- 1ms and Ventricle 1.5ms
14.	Should have sensitivity atrial: 0.4 to mv and ventricular 0.8-20 m v which is incrementally adjustable.
15.	Refractory Period Atrial: 150 – 500 ms (PVARP)
16.	Should have refractory 400ms for AXX modes and 250ms for VXX modes. should have blanking pace 125ms and sense 75ms.
17.	Should have two IEC type LR-6-sized AA batteries 1.5 alkaline batteries which are very easily available in the market.
18.	Should have runaway protection depending on rate settings.
19.	Should have backup battery life > 150hrs.
20.	Should have A/V/PV delay 1.5ms to 300ms. setting automatic depending on the rate manual

Dr. Bharwan Chandra Tripathi  
Professor & MOD  
Department of Cardiology  
Dr. R.M.L.M.S., Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Professor  
M.L.N. Medical College &  
R.N. Hospital, Allahabad

Prof. Sharad Chandra  
MD, DM, FESC, FACC, FSCAI  
Dept. of Cardiology, KGMU, Lko.

21.	Should have PVARP 100 TO 500ms setting automatic depending on rate or normal.
22.	Should have TARP AV Delay +PVARP with minimum rate + 60ppm.
23.	Should have AV/VA blanking 70ms.
24.	Should have UTR/MTR rate + 40ppm.
25.	Should have noise detection at 125ms in automatic mode switch to asynchronous mode.
26.	Pacing cable should be provided.
<b>Certification Required</b>	
1	All accessories should be from the same Original Equipment Manufacturer for the main unit.
2	Instruments must be ISO certified and a copy should be enclosed. (The ISO Certificate must be issued by any organization accredited by the Bureau of Indian Standard or accredited by the international accrediting forum "IAF" (Certificate to be attached).
3	Should be USA FDA or European CE be approved by 4 digits notified body.
4	Other necessary certifications if any required will be provided by the bidder for the smooth functioning of the machine.
5	In case of technical snag/failure/breakdown the response time for the inspection should be within 24 hours and repair within 05 days otherwise provide a service machine/ alternate arrangement to be made till the period of recovery of the breakdown of the unit, failing which attracts penal action as per the decision of institute/hospital.

*Dr. Bhuvan Chandra Tewari*  
 Professor & HOD  
 Department of Cardiology  
 Dr. R.M.L.I.M.S., Lucknow

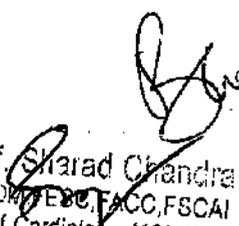
*Prof. Sharad Chandra*  
 MD, DM, FESC, FACC, FSCAI  
 Deptt. of Cardiology, KGMU, Lko.

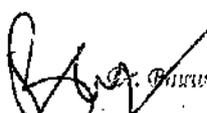
*P.K. Das*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

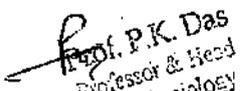
*S.R.N.*  
 Professor  
 Medicine Department  
 M.L.N. Medical College &  
 S.R.N. Hospital, Allahabad

## Portable Echocardiography Machine

1. The system must be a state-of-the-art digital echocardiography machine (not an ultrasound machine) with all digital beam formation, super computed signal processing, and clinically proven imaging technologies. The system quoted must be the latest model.
2. The system must be offered with the following applications:
  - Adult and Paediatric.
  - Capable of upgrading to support Adult and Paediatric TEE.
3. The equipment should be compact, portable, and a standalone unit mounted on 4 wheels. It should be lightweight, with a maximum weight of 8 kg. The weight must be mentioned in the technical sheet.
4. The equipment must be capable of operating in high-definition 2D, M-Mode, Colour Mode, Colour Flow, Tissue Doppler, and Power Doppler.
  - Advanced tissue harmonic imaging based on real-time digital signal storage and phase cancellation techniques to enhance axial and contrast resolution.
  - Gain control in the axial plane.
  - Colour compare mode (colour mode and normal grayscale mode simultaneously).
  - Speckle reduction imaging to reduce speckles and cluster artifacts.
  - Strain imaging.
5. The equipment must have automatic gain adjustment for B-mode imaging.
6. The system must have single-touch auto EF.
7. The system should feature single-touch strain calculation for LV with Auto EF.
8. The system should include strain and strain rate imaging for LV, as well as strain imaging for RV and LA.
9. The system should have TSI (Tissue Synchronization Imaging) or equivalent technology.
10. The system should have blood flow imaging and an Auto IMT feature built-in.
11. The system should have auto cardiac Doppler for adult and paediatric cardiac measurements.
12. The system should support Auto 2D LV study for faster measurements.
13. Scanning depth must be up to 30 cm or more, with at least 60 minutes of battery backup during scan time.
14. Imaging modes of real-time 2D, colour Doppler, pulsed wave Doppler, continuous wave Doppler, and power Doppler must be available.
15. System dynamic range should be 200 decibels or more to pick up subtle echoes. The dynamic range (in dB) must be clearly mentioned in the quote. If not mentioned, a letter from the manufacturer must be attached with the technical bid, clearly stating the dynamic range of the offered system.
16. The system must have 600,000 or more digital processing channels. A technical data sheet should be enclosed to support this. If not mentioned, a letter from the manufacturer must be attached with the technical bid, clearly stating the channels of the offered system.

  
 Prof. Sharad Chandra  
 MD, DM, FRC, FACC, FSCAI  
 Deptt. of Cardiology, KGMU, Lko.

  
 Dr. Anurag Chandra Tiwari  
 Professor & HOD  
 Department of Cardiology  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Professor  
 Medicine Department  
 M.L.N. Medical College &  
 S.R.N. Hospital, Allahabad

17. The system frame rate should be 600 Hz or more. The acquisition frame rate must be clearly mentioned in the quote.
18. The system must be offered with a 2D frame rate of at least 1000 frames per second. The acquisition frame rate must be mentioned in the technical quote. If not mentioned, a letter from the manufacturer must be attached with the technical bid, clearly stating the frame rate of the offered system.
19. Offline measurement and zoom capability with a fully functional measurement facility and calculation should be possible.
20. The system should support respiratory signals for better clinical diagnosis.
21. The system should be offered with frequency compounding or equivalent technology. The processing technology must be highlighted in the technical bid.
22. The system must include single-button control/one-touch functionality for automatic optimization and adjustment of TGC and receiver gain to achieve optimal image quality.
23. The system should be upgradable to advanced echocardiography examinations like stress echo.
24. The system must have a fast startup time, scanning within 180 seconds or less.
25. A flat LCD/TFT monitor of at least 15 inches or more with a flicker-free image, tilt, and swivel facility must be included.
26. A virtual keyboard or a keyboard with a touch control screen panel, with limited knobs and an easy-to-disinfect interface, must be provided.
27. The system should be easy to disinfect, minimizing the risk of infection transmission during machine movement.
28. Onboard/expandable storage of 500 GB or more must be included, with USB connectivity to a computer.
29. The system should include a high-quality trolley from the manufacturer with at least three probe ports.
30. Data transfer capabilities to external storage devices (e.g., hard drive, pen drive, DVD writer) must be provided.
  - The system should have an inbuilt digital archival system for image storage (~5000 images in the system hard disk drive) and a CD/DVD writer.
31. The system must have extensive image management capabilities, including thumbnail review, cine loop editing, etc.
32. The following latest transducers (with a frequency tolerance of  $\pm 2$  MHz) should be supplied with the system:
  - 1 – 5 MHz Broadband 2D Echo transducer for adult cardiology imaging with a 100 degree or more field of view.
  - 3 – 8 MHz Broadband 2D Echo transducer for pediatric cardiology imaging with a 100 degree or more field of view.
  - 2 – 10 MHz Vascular 2D Probe

### 33. Optional Probes

Prof. Sharad Chandra Das (2) MHz Paediatric 2D TEE Probe  
 MD, DM, FESC, FACC, FSCAI  
 Dept. of Cardiology, KGMU, Lucknow

Dr. Anurag Chandra Tiwari  
 Professor & HOD  
 Department of Cardiology  
 Dr. R.M.L.I.M.S., Lucknow

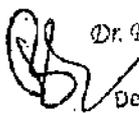
Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

Professor  
 Medicine Department  
 M.L.N. Medical College  
 S.R.N. Hospital, Allahabad

- 2D Echo TEE transducer for adults with frequencies ranging from 2 – 7 MHz.
34. PW/CW Doppler capability must be available in all imaging phased array sector probes.
  35. The system must feature a multi-probe connector with a minimum of three probe connectivity ports.
  36. ECG cable must be included.
  37. The following peripherals must be supplied with the system:
    - Black and white thermal printer.
    - Option to connect an external printer.
  38. The system must operate with a power supply of 200–240 VAC, 50/60 Hz.
  39. Onsite demonstration and training for end users must be provided with requested facilities.

#### Certification required

1. Equipment must be ISO certified and a copy should be enclosed. (The ISO Certificate must be issued by any organization accredited by the Bureau of Indian Standard or accredited by the international accrediting forum "IAF" (Certificate to be attached).
2. Should be USA FDA or European CE be approved by 4 digits notified body.
3. Electrical safety conforms to standards for electrical safety IEC-60601-1
4. Other necessary certifications if any required will be provided by the bidder for the smooth functioning of the machine.
5. In case of technical snag/failure/breakdown the response time for the inspection should be within 24 hours and repair within 05 days otherwise provide a service machine/alternate arrangement to be made till the period of recovery of the breakdown of the unit, failing which attracts penal action as per the decision of institute/hospital.

  
 Dr. Shivan Chandra Tiwari  
 Professor & HOD  
 Department of Cardiology  
 Dr. R.M.L.I.M.S., Lucknow

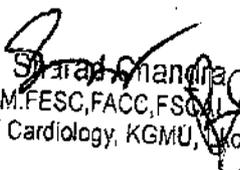
  
 Prof. Sharad Chandra  
 MD, DM, FESC, FACC, FSCAI  
 Deptt. of Cardiology, KGMU, Lko.

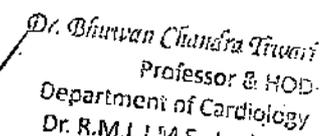
  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

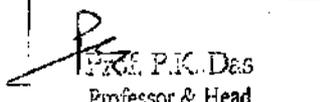
  
 Professor  
 Medicine Department  
 M.L.N. Medical College &  
 S.R.N. Hospital, Allahabad

**TMT Machine**  
**(Computerised Stress Test System)**

Sr. No.	
1.	System should acquire display and analyze 12 simultaneous leads (option for 15 simultaneous leads).
2.	Should have the facility of online storage of (median ECG & raw data). Storage of at-least 100 patients on the HDD in addition to storage on CD drive should be possible (DVD archive should be optional). It should have beat-to-beat storage with the facility to review the entire test.
3.	Updated median with Elimination of artifact ectopy and aberrancy in all leads. Facility to eliminate artifact due to respiratory muscle noise and Ac interference, baseline wandering without comprising/ distortion in ST-segment changes.
4.	Should have the facility to do reanalysis of stored ECG by changing the measurement points like S and J.
5.	The monitors should display an auto comparison of resting ECG versus current lead of maximum ST depression separately with a waterfall color-coded display.
6.	System should display total exercise time/current protocol stage time, PVCs/ minute Target HR, treadmill: speed, grade, Warning messages, lead check etc.,
7.	System should have user-defined report generation in different formats. ST/HR loops & indices if available should also be quoted.
8.	System should provide standard protocols and user-defined protocols.
9.	System should print a comprehensive final report on minute-by-minute record of ST- segment trend. Facility for continuous printout on thermal paper of raw & median data is essential. Additional Laser Jet output should also be provided. The laser jet should be a high-end Laser printer with at least 12 ppm and have the capacity to print up to 100 sheets continuously without any stop due to heating etc.
10.	Automatic arrhythmia detection.

Prof.  S. Prasad Chandra  
MD, DM, FESC, FACC, FSCAI  
Dept. of Cardiology, KGMU, Lucknow

Dr.  Bhuvan Chandra Tiwari  
Professor & HOD  
Department of Cardiology  
Dr. R.M.L.I.M.S., Lucknow

 P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

 Professor  
Medicine Department  
M.L.N. Medical College  
S.R.N. Hospital, Allahabad

11.	System should have Duke Exercise program software & scoring system.
12.	System should have a dynamic scan to show the worst ECG template lead.
13.	System should have online help.
14.	Should be able to provide real-time printing in auto or manual mode in desired formats on a thermal writer with resolution 1000 line/sec x 200 dpi for printing.
15.	System should use the auto programmable imported heavy-duty treadmill and always start from 0 mph with a range 0-12 MPH and have a load capacity of > 150 kgs. The slope range should be from 0 to over 20%.
16.	Treadmill should have auto-calibration, should have two stops modes with digital microprocessor control and be manually operable. The treadmill should comply to AHA/CE guidelines for exercise testing equipment.
17.	All future software upgrades should be free.
18.	Facility to export the report in PDF format to a computer.
19.	Flat-screen 17/19" monitor preferably with LCD display.
20.	Pacemaker rhythm detection facility should be available.
21.	Entire digital system should be on a treadmill on appropriate UPS
22.	Complete report in PDF format.
23.	Complete raw data can be stored on rewriteable CD.
24.	Running trends of heart rate METS & ST level of the enlarged complex during the exercise phase.
25.	Should provide NIBP and SpO2 for adults and padiatrics (6-15 years). Appropriate Size Cuffs (5 each for adult & Paediatric (6-10 years) & 10-15 years, total 15) should be provided and quoted separately also.

Prof. Sharad Chandra  
MD, DM, FESC, FACC, FSCAI  
Deptt. of Cardiology, KGMU, Lucknow

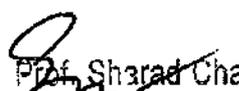
Dr. Bhuvan Chandra Triwari  
Professor & HOD  
Department of Cardiology  
Dr. R.M.L.I.M.S., Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Professor  
Medicine Department  
M.L.N. Medical College &  
S.R.N. Hospital, Allahabad

26.	Saturation monitoring should be by ear / figure probes/ and have provision for elimination of artifacts due to exercise, with an error of +2% in all ranges. Five probes (reusable) should be provided.
27.	Facility to have an entire trace of the raw data.
	<b><u>Certification required</u></b>
1	All accessories should be from the same Original Equipment Manufacturer for the main unit.
2	Instruments must be ISO certified and copy should be enclosed. (The ISO a Certificate must be issued by any organization accredited by the Bureau of Indian Standard or accredited by the international accrediting forum "LAF (Certificate to be attached).
3	Should be USA FDA or European CE be approved by 4 digits notified body.
4	Other necessary certifications if any required will be provided by the bidder for the smooth functioning of the machine.
5	In case of technical snag/failure/breakdown the response time for the inspection should be within 24 hours and repair within 05 days otherwise provide a service machine/ alternate arrangement to be made till the period of recovery of the breakdown of the unit, failing which attracts penal action as per the decision of institute/hospital.

  
 Dr. Sharad Chandra Tiwari  
 Professor & HOD  
 Department of Cardiology  
 Dr. R.M.L.M.S., Lucknow

  
 Prof. Sharad Chandra  
 MD, DM, FESC, FACC, FSCAI  
 Deptl. of Cardiology, KGMU, Lko

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM,  
 Dr. RMLIMS, Lucknow

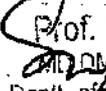
  
 Professor  
 Medicine Department  
 M.L.N. Medical College &  
 S.R.N. Hospital, Allahabad

**AMBULATORY BLOOD PRESSURE MONITOR**

1. Backlit graphical Color Display with the multi-language menu.
2. Unit should be capable of measuring Blood Pressure by oscillometric method.
3. Recording over 48 hours or more.
4. Easy menu guidance with two control buttons.
5. Voice recording of patient data.
6. Examination of adults and children.
7. Programming and storage of up to four individual measurement programs.
8. Facility for the patient to take additional measurements at any time.
9. Should have the facility to choose whether readings should be displayed during measurements or not. To avoid patients from influencing measurements.
10. Recording and storage of up to 400 measurements.
11. Recorder should state when calibration of equipment is required.
12. USB interface for data transmission to a PC.
13. Unit should have provision for a micro-SD card for data storage.
14. Software should have a facility for comprehensive statistical calculations based on the measurements with various numerical and graphical presentations.
15. Lightweight-250 gms (Including battery) or less.

**Accessories:**

1. With Screen size 21 inch
2. DATA Storage for Holter Recorder
3. 1 GB RAM (DDR2)
4. 500 GB Hard Disk (SDD)
5. DVD Writer Combo.
6. Speakers of good quality
7. Multimedia keyboard
8. Cabinet having USB connectors
9. Printer: Black & White LaserJet
10. Suitable UPS for computer.
11. Suitable Trolley for Mounting

  
 Prof. Sharad Chandra  
 MD, DM, FESC, FACC, FSCAI  
 Deptt. of Cardiology, KGMU, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM

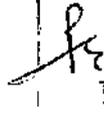
  
 Professor  
 Medicine Department  
 M.L.N. Medical College &  
 S.R.N. Hospital, Allahabad

  
 Dr. Bhawan Chandra Tiwari  
 Professor & HOD  
 Department of Cardiology  
 Dr. R.M.L.M.S., Lucknow

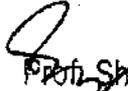
**Certifications:**

1. Should be US FDA / European CE / BIS.
2. The unit should have been designed with IP42 IEC Standard to avoid damages from solid objects & liquid spillage.

  
Dr. Shrawan Chandra Tiwari  
Professor & HOD  
Department of Cardiology  
Dr. R.M.L.I.M.S., Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Professor  
Medicine Department  
M.L.N. Medical College &  
S.R.N. Hospital, Allahabad

  
Prof. Sharad Chandra  
MD, DM, FESC, FACC, FSCAI  
Deptt. of Cardiology, KGMU, Lko.

# Nephrology

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Technical Specifications  
related to Department of Nephrology by committee  
members

SR. NO.	NAME OF EQUIPMENT	GO NUMBER	APPROX. COST
1.	Hemodialysis Machine	New addition	9 LACS
2.	SLED Machine	New addition	19 LACS

This is to certify that technical specification of all the above-mentioned machine/instruments, approved by the technical committee is not of any specific company. The technical features of the equipment/instruments from all reputed firms in the current market have been included in this specification to the best of my knowledge and belief & in the opinion of the technical committee.

The technical specification duly signed by the technical committee members is attached herewith.

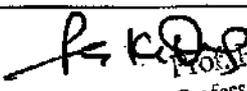
Dr. Abhilash Chandra  
Professor  
Department of Nephrology  
DR RMLIMS, Lucknow

Prof. P.K. Das  
Chairman  
Technical specifications committee  
Clinical Subjects & others  
Head, Department of Anesthesiology & CCM  
DR RMLIMS, Lucknow

## Hemodialysis Machine

1.	<b>Blood Pump</b>
a)	Flow rate range: 50-600 ml/min with 10 ml/min increments, Accuracy: $\pm 10\%$
b)	Effective blood flow rate should be calculated and displayed automatically
c)	It shall be easy and safe to thread with bloodline diameter from 2 mm up to 10 mm
d)	An hand crank/knob/handle shall be provided for returning blood to patient when electrical power is lost
e)	The blood pump should run even in the absence of water or dialysate flow
2.	<b>Heparin Pump</b>
a)	Infusion rate: 0.1-9.9 ml/hr with 1 ml/hr increments, Accuracy: $\pm 5\%$
b)	Positive and negative extracorporeal circuit pressure shall not affect the infusion rate
c)	Heparinization stop time (before end of treatment) between 0-8 hrs and should be user adjustable
3.	<b>Pressure Monitoring and Alarms</b>
a)	Venous pressure monitoring, Range: -60 to + 500 mmHg
b)	Venous pressure alarm: Adjustable high & low alarm limits, Alarm limit can spread and be reset automatically on adjustment of blood flow
c)	Arterial pressure monitoring: Range; -300 to +300 mmHg
d)	Arterial Pressure Alarm: Adjustable high & low alarm limits, Alarm limit can spread and be reset automatically on adjustment of blood flow
4.	<b>Air Detection</b>
a)	Alarm shall be activated for air bubbles and micro bubbles
b)	The tender shall state the sensitivity of the detection mechanism in terms of air bubble size at particular blood flow rate
c)	On detection of excessive air on the venous line, the blood pump shall be stopped and the venous return line shall be clamped at a point below the air detector
d)	Ultrasonic sensor shall be used for preventing being affected by ambient light
5.	<b>Dialysate Flow Rate</b>
a)	Between 300 to 800 ml/min and should be user-selectable, Accuracy: $\pm 10\%$
6.	<b>Temperature Control and Alarms</b>
a)	Control range: 35.0 to 39.0 C in 0.5 C increment
b)	Alarm limits: 33.5 to 40.0 C
7.	<b>Conductivity Control and Alarms</b>
a)	The dialysate conductivity shall be adjusted by setting the sodium concentration
b)	Sodium concentration shall be adjustable from 126 to 150 mmol/l in 1 mmol/l increment and bicarbonate concentration shall be adjustable of $\pm 8$ mmol/l from the original mixing concentration
c)	Sodium and bicarbonate profiling shall be available
d)	Conductivity measurement: Range : 13 to 15 mS/cm, Accuracy: $\pm 0.2$ mS/cm
8.	<b>Blood Leak Detection</b>
a)	Alarm shall be activated for blood loss rate not greater than 0.5 ml/min into dialysate at maximum dialysate flow of hematocrit about 20-25%
b)	Photo-detector should be used
c)	Different types of alarms shall be shown to differentiate a true blood leak incident or dirtiness
9.	<b>Volumetric Ultrafiltration Control</b>
a)	Control range: 0 to 4L/hr given by the set values of UF volume and treatment time
b)	UF volume: 0 to 9.99L adjustable in 1 ml increment
c)	Treatment Time: adjustable up to 9 hr 59 min in 5 min increment
d)	TMP monitoring: -60 to +500 mmHg
e)	Isolated ultrafiltration (ISO-UF) process shall be provided

  
 Dr. Abhilash Chandra  
 MD, DM (Nephrology)  
 Professor  
 Dr. R.M.L.I.M.S., Lucknow

  
 Prof. K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

f)	Ultrafiltration profiling shall be available
10.	Dialysis Parameter Display: The equipment shall digitally display the parameters
a)	Arterial pressure
b)	Venous pressure
c)	Trans-membrane pressure
d)	Blood flow rate
e)	Dialysate flow rate
f)	Dialysate conductivity
g)	UF volume
h)	UF rate
i)	Elapsed and remaining treatment time
j)	Heparin infusion rate
11.	Measurement of adequacy or Kt/V
a)	Built-in facility for measurement of urea clearance (K) and dialysis dose (Kt/V)
b)	Measurements should be non-invasive and without any additional disposables
12.	Machine should have Endotoxin, microbial and micro-impurities filter for dialysate fluid
13.	Facility for heat, chemical disinfection, auto-switch off
14.	Machine should be able to generate bicarbonate dialysis fluid from dry bicarbonate concentrate
15.	Power input to be 220-240VAC, 50Hz fitted with Indian plug. Battery backup should be such that the equipment shall be able to operate the extracorporeal circuit without interruption for at least 15 min in case of AC power failure
16.	Machine should have an in-built automated non-invasive blood pressure monitor
17.	Alarms should have both audio and visual components
18.	Upgradable to future software developments and can be linked with Patient Data Management i.e. machine should be able to integrate with Hospital information system (HIS) and/or HL7 compliant
19.	All consumables and attachments required for installation and standardization of system to be given free of cost. 5 dialyzers with blood tubings should be provided free of cost with each machine
20.	Comprehensive training for staff and support services till familiarity with the system
21.	Should have in-house service facility/manpower with 95% uptime guaranty. The service provider should have the necessary equipment recommended by the manufacturer to carry out preventive maintenance test as per guidelines provided in the service/maintenance manual.
22.	Documentation
a)	User/Technical/Maintenance manuals to be supplied in English.
b)	Certificate of calibration and inspection.
c)	List of Equipment available for providing calibration and routine Preventive Maintenance Support, as per manufacturer documentation in service/technical manual.
d)	Log book with instruction for daily, weekly, monthly and quarterly maintenance checklist. The job description of the hospital technician and company service engineer should be clearly spelt out
23.	All spare parts and accessories including rings, blood pump cover, heparin infusion pump, machine wheels, etc should be covered under warranty and CMC
24.	Voltage stabilizer should be supplied with the machine

#### Certifications:

- US FDA or European CE certified
- Shall comply with IEC 60601-2-16 SAFETY requirements of medical electric equipment part 2-particular requirements for the safety of Hemodialysis equipment.

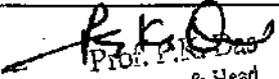
Dr. Abhilash Chandra  
MD, DM (Nephrology)  
Professor  
Dr. R.M.L.I.M.S., Lucknow

*P. K. Das*  
Prof. Dr. P. K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**SLED Machine**

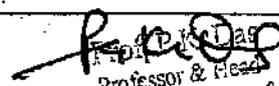
General Requirements		
1	Microprocessor Based Control	Should be microprocessor controlled & capable of providing therapies such as Conventional HD, Online HDF, HF & features such as Online priming, Acetate & Bicarb dialysis, Volumetric UF, Sodium/UF profiling, Online help options (in case of alarm cond.), BPM.
2	Graphical User Interface (Display)	High-resolution TFT touch screen with functional keys & provides a cumulative graphical display of treatment data & physiological trends including sodium & UF profiles. Freely rotatable & adjustable design. Should display different menus (preferably 9) indicating blood system, preparation, dialysate, UF, Treatment, Reinfusion, Cleaning, System parameters, & screen saver option. Should have integrated Patient card reader system where atleast 03 treatment data can be recorded.
3	Safety Features	Should be a close system design with a volumetric balancing system, i.e. volume in=volume out for fresh & used dialysate. Volumetric dilution of concentrates with RO water & Volumetric UF. Self-Test after switching ON, to ensure functioning of all hardware components. Leak sensor & Connection test as additional safety.
Performance Requirements		
Blood Circuit	Vascular Access	Single Needle click clack should be available Blood pump with features such as flow range of 30-600ml/min, with 10ml increments & accuracy upto $\pm 10\%$ . Effective blood rate should be displayed in accordance to the setting & tubing size with a diameter 2mm - 10mm could be used. An emergency hand crank should be provided to enable reinfusion in case of power failure. Emergency button enabled bolus, UF control, BPM control. Air-free pressure measurement on arterial line, because of reducing chance of blood clot. Protective cover for entire EBM (Extracorporeal Blood ckt.)
	Heparin Pump	Should be automatic or manual start/stop, with an infusion rate of 0.5-10ml/hr in 0.1ml/hr increments & $\pm 5\%$ accuracy. Heparinization stop time should be user-adjustable in 1min increments, & positive/negative extracorporeal blood ckt pressure should not affect infusion rate. Auto Bolus administration should be programmable from 1-20ml/hr.
	Pressure Monitoring & Alarms	Venous pressure monitoring & adjustment in case of alarm condition. (Range: +20 to +350mmHg, Accuracy: $\pm 10\%$ ) Arterial pressure monitoring & adjustment in case of alarm condition. (Range: -300 to +300mmHg, Accuracy: $\pm 10\%$ )
	Air Detection	Ultrasonic design & should be activated for air & micro bubbles over the entire blood flow range. The sensitivity of detection mechanism should be specified in terms of air bubble size & on detection of excessive air, the venous clamp should activate & blood pump stop.

Dr. Abhilash Chandra  
MD, DM (Nephrology)  
Professor  
R.M.L.I.M.S., Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

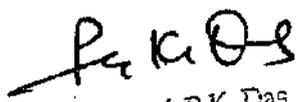
		The reference point for level detector measurement should be about $13 \pm 4$ mm, from upper edge of venous chamber.
Dialysis Circuit	Treatments/Therapies	Should facilitate Acetate & Bicarbonate dialysis. Variable sodium & bicarbonate options. Volumetric UF & Sodium/UF profile options.
	Dialysate flow rates	A Range of 200-800ml/min should be available, with resolution of 100ml/min, with Accuracy- $\pm 10\%$ , & provide good clinical outcome on EDDF therapy for acute patient. Autoflow function should be available with ON/OFF feature, in view to save electricity & water consumption & synchronize with blood flow changes. In-built function to minimizing dialysate and energy use during preparation phase
	Temperature Control & Alarm	Control Range: 34.0 to 39.0 deg Celsius with 0.5 increment Alarm Limits: 33.5 to 40.0 deg Celsius
	Conductivity Control & Alarm	Range: <u>12.5 to 15.7 mS/cm</u> Accuracy: $\pm 0.1$ mS/cm Dialysate conductivity should be adjustable by sodium concentration, for Acetate Dialysis-with range from 125 to 151mmol/l in increment of 1mmol/l. For Bicarbonate dialysis, range from 125 to 151mmol/l in increment of $\pm 8$ mmol/l.
	Blood leak detection	Photo detector used, & alarm should be activated for blood loss rates $< 0.5$ ml/min, with HCT of 20-25%.
	Volumetric UF	Control Range: 0-4L/hr, given by set values of UF volume & treatment time, with accuracy $\pm 1\%$ UF volume: 0-9.99L adjustable in 1ml increment Treatment time: adjustable up to 9 hr 59 min. in 1 min increment TMP monitoring: -100 to +400 mmHg. An isolated ultrafiltration process should be provided.
		Equipment should be capable of online preparation of bicarbonate dialysis fluid & It should be handled by one hand only
	Ultra-pure Dialysate filter	Should have a hygienic connection for ultra-pure dialysate filter Should have endotoxin retention capacity not less than $10^6$ IU. The machine should have an automatic program to change filter, including emptying & filling cycles. Filter should have a life span not less than 12weeks or 100 treatments The filter should be arranged in cross flow setting & equipment should perform flushing during treatment automatically every 1hr. Filter change reminder should be available.
Online Fluid Circuit	For HDF	Both option of Pre-dilution & post-dilution of blood should be available Automatic/ Manual control substitution program with pre/post dilution identity integrate function, dialyser integrate function, Effective blood flow rate integrate, HCT integrate function, Total protein integrate & UF rate integrate functions. Equipment should have 2 ultra-pure filters to prepare the online substitution fluid Should be capable of online preparation of substitution fluid for priming & rinsing of extracorporeal ckt for HD/HDF/HF/ or as injection-bolus & reinfusion at the end of treatment. Substitution fluid delivery rate: 25 to 600ml/min in 1ml/min increment, with accuracy $\pm 0.1$ ms/cm & exchange volume -210L (max.)

Dr. Abhilash Chandra  
MD, DM (Nephrology)  
Professor  
DM, M.L.I.M.S., Lucknow

  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Dialysis Parameter Display	Equipment should display the parameters	Arterial Pressure, Venous Pressure, Blood flow rate, Dialysate Conductivity, TMP, UF volume, UF rate, Remaining treatment time, Heparin infusion rate, Alarm info, etc.
Real-time Kt/V monitoring	Equipment should have	Real-time determination of Kt/V by either measurement of ionic dialysance or UV adsorption Inbuilt measurement & monitoring of effective Urea clearance K, Dialysis dose Kt/v, & Plasma sodium during dialysis This measurement should be done without any additional cost & disposable during each treatment Measuring accuracy: Clearance +/-6% Kt/V +/-9%
Blood Pressure Monitor (BPM)	Equipment should have	Should be Built in non-invasive device for measuring the patient's blood pressure automatically Measuring Range should be Cuff pressure range: 10-325 mmHg or wider choice Systolic range: 45-280 mmHg or wider choice MAP range: 25-240 mmHg or wider choice Diastolic range: 10-240 mmHg or wider choice Pulse rate range: 20-220 1/min or wider choice Alarm values should be Systolic range: 90 & 165 mmHg MAP range: 70 & 120 mmHg Diastolic range: 50 & 100 mmHg Pulse range: 40 & 150 1/min
Battery Backup		The equipment should be able to operate and monitor the extracorporeal circuit without interruption for 20-30 min. in case of AC power failure by backup battery
Disinfection and Cleaning		Both chemical and heat disinfections should be performed Sodium hypochlorite should be used as cleansing disinfectant Various Programmable Cleansing Cycles should be provided with different phases and timings in accordance with different disinfectants. Should be One-touch fully automatic operation including pre-rinse, chemical-intake for combined disinfection & decalcification, post-chemical mandatory rinse, and automatic power-off; without the need of any end-user handling during this whole disinfection process.
Others		All spare parts (including machine wheels, BP cuff, pump cover, heparin pump, etc.) should be covered under warranty and CMC. Local spare parts dealer/distributor should be available. Voltage stabilizer should be provided with the machine One demo kit for installation and 5 dialyzers with blood tubings should be provided free of cost with each machine Relative humidity 15-90%
Certification		Unit should be USFDA/European CE certified.

Dr. Abhilash Chandra  
MD, DM (Nephrology)  
Professor  
Dr. RMLIMS, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

# Neurology



TECHNICAL SPECIFICATIONS  
related to Department of Neurology by committee  
members

SR. NO.	NAME OF EQUIPMENT	GO NUMBER	APPROX. COST
1.	32 Channel EEG Machine	GO-28-Jan-18 Suchi-2	20 - 25 Lacs
2.	Video EEG Machine 40 channel	GO-28-Jan-18 Suchi-2	10 Lacs
3.	Advanced 64 Channel EEG Machine	GO-28-Jan-18 Suchi-2	30 - 35 Lacs
4.	Portable Video EEG Machine	GO-28-Jan-18 Suchi-2	10 - 12 Lacs

This is to certify that technical specification of all the above-mentioned machine/instruments, approved by the technical committee is not of any specific company. The technical features of the equipment/instruments from all reputed firms in the current market have been included in this specification to the best of my knowledge and belief & in the opinion of the technical committee.

The technical specification duly signed by the technical committee members is attached herewith.

  
Dr. Kamlesh Sonkar  
Assistant Professor

Medical College Prayagraj

डा० कमलेश कुमार सोनकर

एम०डी० मेडिसिन

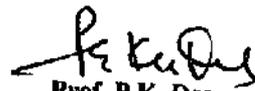
डी०एम० न्यूरोलॉजी

असिस्टेंट प्रोफेसर

दिन-सोमवार, बुक्रवार

कमरा नं०-८, पी०एम०एस०एस०वाई०

चक्रवर्ती रानी नेहरू हॉस्पिटल, प्रयागराज

  
Prof. P.K. Das

Chairman

Technical specifications committee

Clinical Subjects & others

Head, Department of Anesthesiology & CCM

DR RMLIMS, Lucknow

555

### 32 Channel EEG Machine

#### Amplifier:

1. 32 Channel Amplifier with inbuilt SPO2 having atleast 8 channels configurable as bipolar AC and atleast 1 channel for DC to connect external devices.
2. Amplifier must also have built-in Oximetry, patient event button and photic connectivity
3. The Electrode box should be of design of 10-20 International EEG Electrode Placement (Head Shaped)
4. Analog to Digital converter : 16 or 24 bits of ADC resolution or better
5. Sampling Rate : 2 KHz or better for each & every distinct channel. Sampling Rate should not go down with increase in number of channels.
6. Common Mode Input Impedance should be greater than 100 Mohms
7. Equipment should be Sturdy to use
8. Input Noise (Peak to Peak) < 2  $\mu$ V
9. High Filter: 15 Hz to 100 Hz
10. Low Filter: 0.08 Hz to 5 Hz
11. Notch Filter: 50 Hz or off
12. Amplifier connectivity : Internet or USB or Both
13. Must support both Static and Dynamic IP address while connecting to network
14. Amplifier and patient electrode connection box must be two separate devices so that least damage happens to the amplifier when mishandling of the electrode connection box happens.
15. The electrode connection box should be so isolable that patient can carry electrode connection box while moving. Patient electrode box should be a portable one and light in weight.
16. The system should have the capability of acquiring data from both cap electrode and disc electrode.

#### Software :

17. Should have the ability to continue a previous recorded study in the software. i.e. appending the previous record on a later date or time
18. Should have a facility to configure data acquisition to start periodically in an automated fashion.
19. Software should allow the user to prune the EEG and Video data.
20. Software should have security features to allow / deny access to users to various function based on user profile.
21. Should have a report generation facility in MS-Word format, which can be later assigned to particular patients.
22. Should have Individual Channel Control, Customization of Montages, along with remontage Capabilities through toolbar acceleration buttons.
23. Should Combine all user defined settings into templates or protocol, for use in different applications and the protocols should be available for user by a menu selection.
24. Should arrange montages into sets for different patient groups & should display a graphical view of the current montage during the EEG recording.
25. New Sensors should be included as standard viz assigned to amplifier inputs, define traces in a montage, define calculated channels (Average, Source/ Laplacian), or define Trends.
26. Facility to click any point to display corresponding traces & Slide pointer to change displayed duration of the Overview. Display of Time Scale in either elapsed time or time of day.
27. Sortable list of all events placed in the recording, both automatically and manually placed such that when the event is clicked, it shows the corresponding EEG.
28. Software should be provided with AI Based Autoscore, Autoscore should performs with accuracy, sensitivity and specificity near or above 90%, study level assessment, differentiating normal from abnormal EEGs, and for abnormal EEGs, further subclassifying into 4 clinical categories namely Focal epileptiform, Generalized epileptiform, Focal non-epileptiform and Diffuse non-epileptiform.
29. Review and add events to recorded traces in Review Pane while still displaying live traces in Live Pane.
30. Should have Automatic Spike and Seizure Event Detector Software (online and offline)
31. Should have Density Spectral Array for atleast 20 channels.

Page 1 of 2

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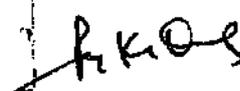
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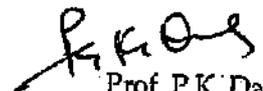
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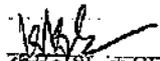
कमरा नं०-8, पी०एम०एस०एस०वाई०

स्वास्थ्य रानी नेहरू हॉस्पिटल, प्रयागराज

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CC  
Dr. RMLMS, Lucknow

<b>Photic Stimulator and HV:</b>
32. Should be supplied with White LED photic stimulator on an adjustable stand so that photic artifacts doesn't interfere EEG signals with manual and automatic programmable through software.
33. Should have facility to adjust Intensity of LED
34. Automatic time counters and event insertion during Hyperventilation.
<b>Video Camera:</b>
35. Digital Full HD Bosch / Panasonic/Sony/Axis or equivalent networked camera with fully synchronized video and have facility for video compression and high definition PTZ camera and should also have synchronization with Video and EEG recording with controlled from software with Sturdy Mic for sound recording.
36. 1/28 inch progressive scan CMOS Minimum Illumination Colour: 1.4lx
37. True Day/Night Mode
38. Auto-focus Zoom Lens
39. Minimum object distance upto 1500mm (tele)
40. Pan angle 340 degrees.
41. Simultaneous view of both cameras in single EEG recording
42. System should have Facility for Video Compression
43. Wall mounted High Definition (HD) Digital video Camera. Synchronisation between Video & EEG recording.
44. HD Networked Video Camera with PTZ Control to be provided along with the system.
<b>Acquisition Station Computer :</b>
45. Branded Desktop system with Core i5 Processor or better, 16 GB RAM, 256 GB SSD and 2 TB HDD, keyboard, optical mouse, 22" LED, UPS 1 KVA, Metallic Trolley with Caster, Laser Printer (B & W), Antivirus till warranty period, Isolation Transformer.
46. Should come preloaded with Microsoft genuine windows 10
47. Should come preloaded with the genuine latest Microsoft Office.
48. The data acquisition system should be supplied along with-recovery software created while initialising the machine.
<b>Additional Amplifier:</b>
49. Should be supplied with additional amplifier with 32 channel incl 4 Bipolar Channel and 4 DC Channels, this amplifier should have inbuilt recorder / inbuilt memory to record upto 96 hours of EEG. Should run on removable AA Batteries and USB connectivity for transfer of data, connection for Photic Stimulation and inbuilt SPD2. Original Carry Bag from OEM with Strap for ease of patient movement.
<b>Accessories:</b>
50. Gold Plated EEG Electrodes – 50 Nos.
51. Patient Event Button – 1 No.
52. EEG Paste (200 Gms or more) – 10 Nos., Skin Prepping Gel (110 Gms or more) – 10 Nos., Measuring Tape – 1 No., Conductivity Gel – 5 Nos., Blunt Needle, Syringe
<b>Standards:</b>
53. Bidder should have at-least 10 installation of the same quoted model in reputed Govt Hospital / Medical College. Performance Report from atleast 5 hospitals for same model should be attached alongwith technical bid.
54. Comprehensive Training to Lab Staff until familiarity with the equipment to be provided.
<b>Certification</b>
55. It is mandatory that the system should be Certified US FDA approved. Vendor to attach the Certificate clearly mentioning the model, address of manufacturer and validity on the certificate.

  
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 Dr. RMLIMS, Lucknow

  
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 कमरा नं०-४, पी०एम०एस०एस०वाई०  
 कल्याण रानी नेहरू हॉस्पिटल, प्रयागराज

## Video EEG Machine 40 channel

40 Channel Electro Encephalograph Machine should have the following features:

Sr. No.	Parameter	Specifications
1	<b>EEG Head Box</b>	
	Number of Channels	40 (EEG 28, Bipolar 8, DC 4)
	Input Impedance	>1000 Mohm
	Internal Noise Level	<1 $\mu$ V P-P
	CMRR	>120 dB
	Sampling Rate	1024, 256, 512 at ADC and Storage
	ADC	24 bit
	Frequency response	0.1 Hz to 100 Hz
	Dimension (mm)	L 245, W 205, H 45
	Weight	$\approx$ 1.5 Kg
	Data communication	Through USB
	Impedance	Bed Side Impedance. Showing ring around the electrode. On/Off switch on Headbox as well as PC Software
	Input power supply	$\pm$ 5V $\pm$ 0.5V DC
	Video	Video Recording of 2 camera's simultaneously.
2	<b>Photic Stimulation</b>	
	Stimulation Mode	2 Modes 25 steps programmable & Single
	Mode of operation	Auto / Manual
	Stimulation Rate	1-60 Hz
	Stimulation Period	1 to 60 seconds
	Light Source	High intensity white LED's
	Light Intensity	60 to 80 candela light
3	<b>Environmental Limits</b>	
	Storage & Operating Temperature	5°C to 50°C
	Humidity	5% to 95%
	Atmospheric Pressure	70 to 106 Kpa
4	<b>Data Processing/Software</b>	
	Sensitivity	1, 2, 3, 5, 7.5, 10, 15, 20, 30, 50, 75, 100, 150, 200, 300, 500, 750, 1000 $\mu$ V/mm, User defined (1-1000 $\mu$ V/mm)
	Low-Cut Filter	0.1 Hz, 1.6sec ; 0.3 Hz, 0.53sec ; 0.5 Hz, 0.32sec ; 1.0 Hz, 0.16sec ; 3.0 Hz, 0.053sec ; 5.0 Hz, 0.032sec ; 6.0 Hz, User defined (0.1-7.0 Hz)
	High-Cut Filter	0.1Hz, 0.3Hz, 0.5Hz, 2Hz, 5Hz, 10Hz, 15Hz, 35Hz, 70Hz, User defined (10-99 Hz)
	Notch Filter	50, 60 Hz & OFF
	Calibration Level	4, 8, 16, 24, 32 $\mu$ V
	Impedance Check	Display on screen as well as on HeadBox
	Montages	Unlimited
	Marking Signals	Photic stimulation, Hyperventilation, External Event Mark
	Sweep Speed	0.9375, 1.875, 3.75, 7.5, 15, 30, 60, 150, 300.60 mm/sec (320, 160, 80,

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 कक्षा नं०-8, पी०एम०एस०एस०वाडो  
 अरुण रानी नेहरू हॉस्पिटल, प्रयागराज

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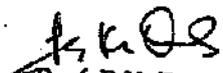
		40, 20, 10, 5, 2, 1 seconds data/page)
	Hyperventilation Period	Stimulation period 0, 1, 2, 3, 4, or 5 minutes (1, 2, 3, 4, 5 Auto Stop After Minutes and shift to Post HV)
	Post Hyperventilation Period	Stimulation period 1, 2, 3, 4, or 5 minutes
	Graphic Signal Resolution	1920 x 1080 (Full HD) Recommended
	No. of Display Channels	Up to 64 channels
	Display Modes	Overwrite and page-by-page
	Waveform Display Color	Any
	Waveform Display On/Off	Yes
	Waveform Freeze	Yes
	Event Marking external	Yes
	Event Marking s/w internal	50
5	<b>Printing &amp; Review</b>	
	Print Format	User defined reports, actual/ print to scale
	Paper Size	Plain paper A4 size or A3 size
	PDF	Print to PDF and Email PDF
	Data Storage	Internal on Hard Disk & External (on Pen drive, CD-ROM's, etc.)
6	<b>Others</b>	
	EEG Recording	Raw
	Brain Mapping	Amplitude Brain Map, Tri Map, Frequency Distribution, Frequency Spectra, Successive Amplitude Brain Map, Frequency Progressive, Frequency Table, 3D Brain Mapping should be there.
	Spike Detection	According to spike width and height
	Measurement	Amplitude basis and time
	Split Screen	2 or 3 with individual montages
	CSA/DSA	Average Spectrum, CSA, DSA, Tabular
	Archiving	Normal, Auto run CD/DVD, Email
	FFT	No Window, Hamming Window, Hanning Window, Blackman Window
	Frequency Analysis	Delta, Theta, Alpha, Beta
	Dot Density Array	Amplitude based DSA
	Export	Raw data to Ms-Excel, EDF (European Data Format), ASCII
	Highlight Specific Area	Mark particular abnormality
	Comments	Add free comments
	Compress	ZIP Data
	Compatibility with other software	Send data to Labview/ Matlab
	View Time	Actual or Recording
	DICOM	Send the marked pages as a DICOM image to PACS/DICOM Server
	Reporting	Indication for Pending reports or reporting to be done

  
 डा० कमलेश कुमार शर्मा  
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 असिस्टेंट प्रोफेसर  
 दिन-सोमवार, शुक्रवार  
 अस्पताल नं०-८, पीएमएसएसएचवाडी  
 अखिल भारतीय वैद्यकीय संस्थान, पुणे

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology  
 Dr. R.M.L.H.S.

	Coherence	Compare the signal with another signal
	HRV	Heart Rate Variability Report
	HL7	Send report in HL7 Format
7	<b>Standard Accessories:</b>	
		HeadBox - 1 No
		Adaptor Box -1 No
		Photic Flash - 1 No
		Event Marker - 1 No
		Video Camera - 2 Nos
		EEG Trolley - 1 No
		EEG Disk Electrodes - 50 Nos
		EEG Paste - 1 Jar
		Head Box Cable - 1 No
		USB Cable - 1 No
		Patient ground cable - 1 No
		Power Cord - 1 No
		Fuse (1.5A/220V) - 2 Nos
		Software CD - 01
		User Manual - 1 No
8	<b>Computer Specifications</b>	Processor Intel i5 or above, RAM 4 GB or above, 500 GB HDD or above, LCD/TFT Screen 23" (Full HD with 1920x1080 Resolution) with 1 cordless keyboard, 1 cordless Mouse , UPS
9	<b>Printer : Black and White Laser</b>	
10		<ul style="list-style-type: none"> <li>➤ Should be Simple and easy to operate.</li> <li>➤ Should be Light weight and compact amplifier comfortable for adults and children.</li> <li>➤ Should be USB 2.0/3.0 interface enables Desktop or laptop based acquisition stations</li> <li>➤ Synchronized high- resolution MPEG-4 Video camera.</li> <li>➤ Flexible photic stimulator based on high intensity LED's</li> <li>➤ Bed Side Impedance. Impedance indication on the headbox with On/Off facility on headbox as well as PC software</li> <li>➤ Electrode Test features on amplifier box</li> <li>➤ Unlimited No. of montages</li> <li>➤ Unlimited continuous recording along with video.</li> </ul>

  
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11	<ul style="list-style-type: none"> <li>➤ Internal/External Calibration signal.</li> <li>➤ All the settings should be done at single stage configuration.</li> <li>➤ Clinician should view and record data upto 64 channels.</li> <li>➤ Facility to reformat of gain, filter and sweep speed online/offline.</li> <li>➤ The system ensures patient safety through optical isolation.</li> <li>➤ EEG software modules should be fully compliant with Latest Microsoft windows platform .</li> <li>➤ In the analysis module, sensitivity and filters of the recorded data should be changed.</li> <li>➤ Highly advanced database management with different searching options.</li> <li>➤ Facility to record and review EEG simultaneously and can write comments during review.</li> <li>➤ Facility to see one/all display channels by double clicking on the respective channel.</li> <li>➤ Split screen facility for viewing channels simultaneously comprising three different montages at the same time.</li> <li>➤ Facility to search the patient from database by ID, patient name, DOB, referring doctor and test date.</li> <li>➤ Variable speeds to review an EEG data.</li> <li>➤ Facility to Add free comment option on control bar.</li> <li>➤ Facility of Calculator, notepad, calendar available on control bar in utility menu.</li> <li>➤ Option to search events &amp; comments.</li> <li>➤ Facility to measure amplitude and frequency at any portion of Eeg.</li> <li>➤ Display of time and events bar at the bottom of the screen should be there</li> <li>➤ Facility of Auto spike detection.</li> <li>➤ Facility to Email PDF Printouts</li> <li>➤ Exporting and importing to European Data Format so that EEG data can be viewed on any international machines supporting EDF format.</li> <li>➤ Print only PDF from Printouts option</li> <li>➤ Facility to Directly email the EEG data from software and also possible of storage on external storage device with and without auto run software facility.</li> <li>➤ Facility to create Source Laplacian/weighted average Montage</li> <li>➤ Online Support must be compulsory. That through internet access the system by customer care of principal manufacturer.</li> <li>➤ Facility to Update the software over internet (Online update) must be compulsory and in this feature latest software downloaded from principal manufacturer through internet.</li> <li>➤ Digital output - Date in FFT Format, Excel for research purpose.</li> </ul>
12	<p><b>Certifications:</b></p> <ul style="list-style-type: none"> <li>➤ Must have valid QMS (ISO 9001 and EN ISO 13485) certificate of the manufacturer.</li> <li>➤ Manufacturer must have Bureau of Indian Standards (BIS) or USFDA or European CE from Notified Body. [Non-Notified Body CE certificate is not acceptable]</li> </ul>

*KMS*

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*P.K.D.*

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## Advanced 64 Channel EEG Machine

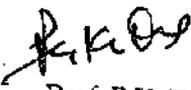
### Amplifier:

1. Video EEG system with more than 80 channels, upgradable to 256 channels with minimum 40 referential Channels, 24 Programmable (from Differential to Referential) and 16 DC Channels.
2. Amplifier must also have built-in Oximetry, integrated Pressure Sensor, patient event button and photic connectivity
3. The Electrode box should be of design of 10-20 International EEG Electrode Placement (Head Shaped)
4. Analog to Digital converter : 24 bits of ADC resolution or better
5. Sampling Rate : 4 KHz or better for each & every distinct channel. Sampling Rate should not go down with increase in number of channels.
6. Common Mode Input Impedance should be greater than 1 Gega Ohms
7. Equipment should be Sturdy to use
8. Input Noise (Peak to Peak) < 2  $\mu$ V
9. Input Bias Current < 1 Na
10. High Filter: 15 Hz to 300 Hz
11. Low Filter: 0.08 Hz to 5 Hz
12. Notch Filter: 50 Hz or off
13. Amplifier connectivity : Both Internet and USB
14. Must support both Static and Dynamic IP address while connecting to network
15. Integrated 8 -Bit trigger for synchronizing external events
16. Amplifier and patient electrode connection box must be two separate devices so that least damage happens to the amplifier when mishandling of the electrode connection box happens.
17. The electrode connection box should be so isolable that patient can carry electrode connection box while moving. Patient electrode box should be a portable one and light in weight.
18. The system should have the capability of acquiring data from both cap electrode and disc electrode.
19. Amplifiers should have an option to connect the Cap directly with single connector on the amplifier and not by individual connector for each channel.

### Software :

20. Should have the ability to continue a previous recorded study in the software. i.e. appending the previous record on a later date or time
21. Should have a facility to configure data acquisition to start periodically in an automated fashion.
22. Software should allow the user to prune the EEG and Video data.
23. Software should have security features to allow / deny access to users to various function based on user profile.
24. Should have a report generation facility in MS-Word format, which can be later assigned to particular patients.
25. Should have Individual Channel Control, Customization of Montages, along with remontage Capabilities through toolbar acceleration buttons.
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duration of the Overview, Display of Time Scale in either elapsed time or time of day.
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31. Software should be provided with AI Based Autoscore, Autoscore should performs with accuracy, sensitivity and specificity near or above 90%, study level assessment, differentiating normal from abnormal EEGs, and for abnormal EEGs, further subclassifying into 4 clinical categories namely Focal epileptiform, Generalized epileptiform, Focal non-epileptiform and Diffuse non-epileptiform.
32. Review and add events to recorded traces in Review Pane while still displaying live traces in Live Pane.
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38. Digital Full HD Bosch / Panasonic/Sony/Axis or equivalent networked camera with fully synchronized video and have facility for video compression and high definition PTZ camera and should also have synchronization with Video and EEG recording with controlled from software with Sturdy Mic for sound recording.
39. 1/28 inch progressive scan CMOS Minimum Illumination Colour: 1.4lx
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44. Simultaneous view of both cameras in single EEG recording
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<b>Acquisition Station Computer :</b>
48. Branded Desktop system with Core i5 Processor or better, 16 GB RAM, 256 GB SSD and 2 TB HDD, keyboard, optical mouse, 22" LED, UPS 1 KVA, Metallic Trolley with Caster, Laser Printer (B & W), Antivirus till warranty period, Isolation Transformer.
49. Should come preloaded with Microsoft genuine windows 10.
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<b>Accessories:</b>
53. Gold Plated EEG Electrodes – 50 Nos.
54. Patient Event Button – 2 Nos. (One for Patient and Other for Attendant) both connected at

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 डीएमए सुश्लोक  
 अस्पिटल प्रोफेसर  
 दिन-सोमवार, शुक्रवार  
 फ्लोर नं-8, पीएमएसएसवाईड  
 अखिल शर्मा नेहरू हॉस्पिटल, प्रयागराज

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

same time.

55. EEG Paste (200 Gms or more) – 10 Nos., Skin Prepping Gel (110 Gms or more) – 10 Nos., Measuring Tape – 1 No., Conductivity Gel – 5 Nos., Blunt Needle, Syringe

**Standards:**

56. Bidder should have at-least 10 installation of the same quoted model in reputed Govt Hospital / Medical College. Performance Report from atleast 5 hospitals for same model should be attached alongwith technical bid.

57. Comprehensive Training to Lab Staff until familiarity with the equipment to be provided.

**Certification:**

58. It is mandatory that the system should be Certified US FDA approved. Vendor to attach the Certificate clearly mentioning the model, address of manufacturer and validity on the certificate.

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डॉ० कमलेश कुमार सोनकर

एमडी मेडिसिन

डीएमओ एनेस्थीसियोलॉजी

असिस्टेंट प्रोफेसर

दिन-सोमवार, शुक्रवार

कक्ष नं०-8, पीएमएसएसएसवाई

सदरम रानी नेहरू हास्पिटल, प्रयागराज

*Handwritten signature*

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## Portable Video EEG Machine

General Specifications	
No. of Channels	12
Description of Channels	Referential EEG Channel: 24 Bi-polar Channel: 05 DC Channel: 03
No. of Display Channels	64
Display Modes	Overwrite and page-by-page
Sweep Speed	5, 10, 20, 40 seconds data/page
Event Marking	Yes
Waveform	Waveform Display Color, Waveform Display On/Off, Waveform Freeze.
Data Acquisition	
Input Impedance	>100Mohm
Internal Noise Level	<1 $\mu$ V P-P
CMRR	>100 dB
Sampling Rate	1024 / 256 Hz at ADC (256 Hz for storage)
ADC	16 bit
High-Cut Filter	100 Hz
Low-Cut Filter	0.05 Hz
Data Processing	
Sensitivity	1, 2, 3, 5, 7.5, 10, 15, 20, 30, 50, 75, 100, 150, 200, 300, 500, 750, 1000 $\mu$ V/min and user define sensitivity.
Low-Cut Filter	1.6 (0.1), 0.53 (0.3), 0.32 (0.5), 0.16 (1.0), 0.053 (3.0), 0.032 (0.5) Hz and user define filter.
High-Cut Filter	0.1, 0.3, 0.5, 2, 5, 10, 15, 35, 70, 100 Hz and user define filter.
Notch Filter	50 or 60 Hz, ON/OFF Facility
Calibration Level	2 - 1000 $\mu$ V
Calibration Rate	1 - 10 Hz
Impedance Check	Indication on screen: All electrodes are displayed on the screen in electrode position layout. Electrodes with impedance higher than the present impedance threshold are highlighted automatically.
Marking Signals	Photic stimulation, Hyperventilation, External Event Mark
Sweep Speed	7.5, 15, 30, 60 mm/sec
Hyperventilation	Stimulation period 1, 2, 3, 4, or 5 minutes
Photic Stimulation	
Stimulation Mode	2 Modes (25 steps programmable, Single)
Mode of operation	Continuous operation with pause time
Stimulation Rate	1-60 Hz
Stimulation Period	1 to 60 seconds
Light Source	High intensity white LED's
Video Camera functionalities	- Should be with remote control for PAN, Tilt and Zoom facilities. - Unlimited continuous recording along with video.
3D Brain Mapping should be there.	
Internal / External Calibration signal should be available.	
All the settings should be done at single stage configuration.	
Facility to reformat of gain, filter and sweep speed online/offline should be available.	

*KBS*  
डा. कमलेश कुमार सोनकर

एन.ए.के. मेडिकल

अंतरिक्ष प्रौद्योगिकी

अभियंता केंद्र

दिन-शोमवार, शुक्रवार

पता नं-8, पी.एम.एस.ए.स.बाई

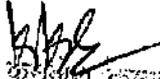
*P. K. Das*  
Dr. P. K. Das

Professor & Head

Dept. of Anesthesiology & CCM

Dr. RMLIMS, Lucknow

In the analysis module, sensitivity and filters of the recorded data should be changeable.	
Should have the Facility to record and review EEG simultaneously and can write comments during review.	
Split screen facility for viewing channels simultaneously comprising three different montages at the same time should be available.	
<b>Printing</b>	
Print Format	User defined reports. Printout fit to page / actual grid options; 1 sec, 10 sec
Paper Size	Plain paper A4 size
Printing Speed	Selectable
Printing Sensitivity	Selectable
Filter	25 Hz, 35 Hz and 100 Hz
Printouts	Fit to page and real time printouts
<b>Review</b>	
EEG	Raw EEG, Brain mapping, frequency mapping
<b>Data Storage</b>	
Local Storage	On hard disk, separate folder for each test.
External storage	Selected records can exported to CD-ROM's
<b>Electrical Specifications</b>	
Power Supply	220 V, 50 Hz or 110 V /60 Hz (for battery charging)
<b>Environmental Operating limits</b>	
Operating Temperature	5°C to 50°C
Storage Temperature	-10°C to 55°C
Humidity	5% to 90%
Atmospheric Pressure	70 to 106 kPa
<b>Basic Laptop Specifications</b>	
Processor	i5
RAM	8 GB
Hard Disk/Storage	512 GB SSD
Monitor/Display	14" Screen
Printer	Laser Printer Black & White.
Facility to Update the software over internet (Online update) must be compulsory and in this feature latest software downloaded from principal manufacturer through internet.	
Exporting and importing to European Data Format so that EEG data can be viewed on any international machines supporting EDF format.	
Online Support must be compulsory. That through internet access the system by customer care of principal manufacturer.	
Must have IEC Test Reports of EEG Machine from Govt/NABL/Approved Lab.	
Must have valid QMS (ISO 9001 and EN ISO 13485) certificate.	
Must have BIS/ European CE from Notified Body/ US FDA approved product.	

  
 डॉ० क. क. दास  
 एमडी मेडिसिन  
 डीएनओ एनेस्थीसियोलॉजी  
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# Ophthalmology

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## Declaration Certificate about Technical Specifications related to Department of Ophthalmology by committee members

Sr. No.	GO No./Name	Generic Nomenclature	APPROX BUDGET		
			Basic (Rs.)	Medium (Rs.)	Advanced (Rs.)
1.	GO-28-Dec-17 Suchi-1	SURGICAL INSTRUMENTS SET (OPHTHALMOLOGY)	50,000/-		1,00,000/-
2.	GO-28-Dec-17 Suchi-1/ GO-1/112605/2021/ GO-7-Dec-2022 / GO-1/112605/2021	OPERATING MICROSCOPE (OPHTHALMOLOGY)	75,00,000/-	1.3 CRORE	3 CRORES
3.	GO-06-Mar-18 Suchi-3	CHALAZATION SET	5,000/-		
4.	GO-06-Mar-18 Suchi-3/ GO-23-Aug-18 Suchi-4	DACRYO-RHINO-CYSTOTOMY SET	50,000/-		1,00,000/-
5.	GO-06-Mar-18 Suchi-3	ENUCLEATION-EVISCERATION SET	30,000/-		
6.	GO-06-Mar-18 Suchi-3	TRABECULECTOMY SET (GLAUCOMA)	50,000/-		1,30,000/-
7.	GO-06-Mar-18 Suchi-3	KERATOPLASTY SET	50,000/-		1,30,000/-
8.	GO-06-Mar-18 Suchi-3	LENS IMPLANTATION SET	50,000/-		1,30,000/-
9.	GO-06-Mar-18 Suchi-3	LID TRICHIASIS AND PTOSIS SET	50,000/-		1,30,000/-
10.	GO-06-Mar-18 Suchi-3	LIST OF EQUIPMENT'S FOREIGN BODY EXTRACTION SET	50,000/-		1,30,000/-
11.	GO-06-Mar-18 Suchi-3	PHACO MICRO-SURGICAL SET	50,000/-		1,30,000/-
12.	GO-06-Mar-18 Suchi-3	PTERYGIUM SET	50,000/-		1,30,000/-
13.	GO-06-Mar-18 Suchi-3	REFRACTIVE SET AND LIST OF EQUIPMENT'S FOR RADIAL KERATOTOMY	50,000/-		1,30,000/-
14.	GO-06-Mar-18 Suchi-3	STITCH REMOVAL SET	50,000/-		
15.	GO-06-Mar-18 Suchi-3/ GO-23-Aug-18 Suchi-4	STRABISMUS SET (FOR OPHTHAMOLOGY)	50,000/-		1,30,000/-
16.	GO-06-Mar-18 Suchi-3	VITRECTOMY SET	50,000/-		1,30,000/-
17.	GO-23-Aug-18 Suchi-4/ GO-1/426645/2023	A SCAN BIOMETER	5,00,000/-		10,00,000/-
18.	GO-23-Aug-18 Suchi-4 / GO-7-Dec-2022/ GO-1/426645/2023	OCT MACHINE	60,00,000/-		1.4 CRORES
19.	GO-23-Aug-18 Suchi-4	A/B SCAN	15,00,000/-		25,00,000/-
20.	GO-23-Aug-18 Suchi-4	APPLANATION TONOMETER	1,00,000/-		
21.	GO-23-Aug-18 Suchi-4	AUTOREFRACTOMETER	5,00,000/-		10,00,000/-
22.	GO-23-Aug-18 Suchi-4	COLOUR VISION CHART	50,000/-		
23.	GO-23-Aug-18 Suchi-4	DIPLOPIA GOGGLES	10,000/-		
24.	GO-23-Aug-18 Suchi-4 / GO-1/112605/2021	FUNDUS CAMERA	10,00,000/-		30,00,000/-
25.	GO-23-Aug-18 Suchi-4	GONIOSCOPE	60000/EACH		
26.	GO-23-Aug-18 Suchi-4 / GO-7-Dec-2022/ GO-1/426645/2023	INDIRECT OPHTHALMOSCOPE	2,50,000/-		
27.	GO-23-Aug-18 Suchi-4	MADDOX ROD & MADDOX WING	5,000/-		
28.	GO-23-Aug-18 Suchi-4	NEAR VISION CHART WITH DIFFERENT LANGUAGE	5,000/-		
29.	GO-23-Aug-18 Suchi-4 / GO-1/112605/2021 / GO-7-Dec-2022 GO-1/112605/2021	PHACO MACHINE	30,00,000/-	50,00000	1.25 CRORES

*Dr. Shikha*  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Dr. Prolima Thacker*  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*Dr. P.K. Das*  
Professor

Dept. of Ophthalmology  
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Prayagraj

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**Declaration Certificate about Technical Specifications  
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30.	GO-23-Aug-18 Suchi-4	PRISM BAR	30,000/-		30,000
31.	GO-23-Aug-18 Suchi-4 / GO-23-Aug-18 Suchi-4	RETINOSCOPE	30,000/-		30,000/-
32.	GO-23-Aug-18 Suchi-4	SCHIOTZ TONOMETER	20000/-		
33.	GO-23-Aug-18 Suchi-4	SLIT LAMP	10,00,000/-		20,00,000/-
34.	GO-23-Aug-18 Suchi-4	SNELLEN CHART (SNELLEN DRUM WITH OR WITHOUT REMOTE CONTROL)	1,00,000/-		
35.	GO-23-Aug-18 Suchi-4 / GO-1/426645/2023	SPECULAR MICROSCOPE	25,00,000/-		
36.	GO-23-Aug-18 Suchi-4	SYOPTOPHORE	1,00,000/-		
37.	GO-23-Aug-18 Suchi-4	DIGITAL TONOMETER (TONOPEN)	4,50,000/-		
38.	GO-23-Aug-18 Suchi-4	TRIAL FRAME	5,000/-		
39.	GO-23-Aug-18 Suchi-4	TRIAL SET	5,000/-		
40.	GO-1/112605/2021	SLIT LAMP (PHOTO)	30,00000		50,00000
41.	GO-1/112605/2021/ GO- 7-Dec-2022	YAG LASER (OPHTHALMOLOGY)	25,00,000/-		50,00,000/-
42.	GO-1/112605/2021	OPTICAL BIOMETER	80,00,000/-		
43.	GO-1/112605/2021	A-B SCAN (WITH UBM PROBE)	30,00,000/-		50,00,000/-
44.	GO-1/112605/2021	GREEN LASER	50,00,000/-		1.75 CRORES
45.	GO-1/112605/2021	OCT MACHINE (WITH ANGIOGRAPHY)	70,00,000/-		1.4 CRORES
46.	GO-7-Dec-2022	ADVANCED VISUAL FIELD ANALYSER	80,00,000/-		
47.	GO-7-Dec-2022	CORNEAL TOPOGRAPHY	80,00,000/-		
48.	GO-7-Dec-2022	OPHTHALMOSCOPE (DIRECT)	60,000/-		
49.	GO-7-Dec-2022	AUTO REFRACTOMETER (HAND HELD)	600000		
50.	GO-7-Dec-2022/ GO-7-Dec-2022	AUTO KERATO REFRACTOMETER (HANDHELD)	1200000		
51.	GO-7-Dec-2022	PERKINS TONOMETER (HANDHELD)	2,50,000/-		
52.	GO-7-Dec-2022	LOW VISION DEVICES	500000		
53.	GO-1/426645/2023	FUNDUS CAMERA (PORTABLE)	6,00,000/-		60,00,000/-
54.	GO-1/426645/2023	LENS (2.2 D)	50,000/-		
55.	GO-1/426645/2023	LENS (20-D)	40,000/-		
56.	GO-1/426645/2023	LENS (90-D)	50,000/-		
57.	GO-1/426645/2023	DIAMOND KNIFE (CLEAR CORNEA)	40,000/-		
58.	GO-1/426645/2023	DIGITAL WIDE FIELD IMAGING SYSTEM WITH FFA	1.3 crore		
59.	GO-1/426645/2023	GRID LENS	90,000/-		
60.	GO-1/426645/2023	IRIDOTOMY LENS	60,000/-		
61.	GO-1/426645/2023	HAND HELD TONOMETER (KEELER)	6,00,000/-		
62.	GO-1/426645/2023	VISUAL ACUITY CARDS (PAEDIATRIC)	10,00,000/-		
63.	GO-1/426645/2023	PRP LENS	1,50,000/-		
64.	GO-1/426645/2023	RF CAUTERY	50,000/-		
65.	GO-1/426645/2023	REDUCTION LENS	12,00,000/-		
66.	GO-1/426645/2023	SYNAPTOPHORE	200000		
67.	GO-1/426645/2023	UNIT CHAIR (OPHTHALMOLOGY)	2,80,000/-		

*Dr. Shikha Agarwal*  
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Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Dr. Prolima Thacker*  
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FRCS (Glasgow) FAICO  
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 M.L.N. Medical College  
 Lucknow

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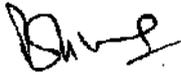


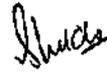
## Declaration Certificate about Technical Specifications related to Department of Ophthalmology by committee members

68.	GO-1/426645/2023	YAG-CAPSULOTOMY LENS	60,000/-		
69.	NEW ADDITION	HAND HELD SLIT LAMP	10,00000/-		
70.	NEW ADDITION	VITRECTOMY MACHINE	15000000 (1.5 CRORE)		
71.	NEW ADDITION	TTT	80,00000		
72.	NEW ADDITION	NCT	10,00000		
73.	NEW ADDITION	78 D LENS	50,000		
74.	NEW ADDITION	3D MICROSCOPE	60000000 (6 CRORE)		
75.	NEW ADDITION	FEMTO CATARACT SYSTEM	9 CRORE		
76.	NEW ADDITION	FEMTO LASIK/SMILE	9 CRORE		
77.	NEW ADDITION	EXCIMER LASER (LASIK)	5 CRORE		
78.	NEW ADDITION	Ultra wide field fundus camera with FFA with inbuilt OCT	1.5 crore		
79.	NEW ADDITION	GUARDED CALIBRATED DIAMOND KNIFE (FOR LRI)	3 LACS		
80.	NEW ADDITION	SPECULAR MICROSCOPE (EYE BANK FOR DONOR CORNEA)	60 LACS		
81.	NEW ADDITION	AUTOMATED LAMELLAR DISSECTOR FOR DSAEK	40 LACS		
82.	NEW ADDITION	VISUAL ELECTROPHYSIOLOGY SYSTEM	85 LACS		
83.	NEW ADDITION	TEFLON BLOCK	3,000/-		
84.	NEW ADDITION	CRYOSURGICAL UNITS, OPHTHALMIC (CO2 AND N2O)	1.25 Lacs		

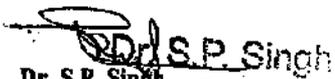
This is to certify that technical specification of all the above-mentioned machine/instruments, approved by the technical committee is not of any specific company. The technical features of the equipment/instruments from all reputed firms in the current market have been included in this specification to the best of my knowledge and belief & in the opinion of the technical committee.

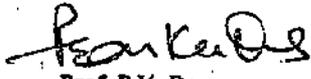
The technical specification duly signed by the technical committee members is attached herewith.

  
Dr. Prolima Thacker  
Assistant Professor  
Dr. RMLIMS, Lucknow

  
Dr. Shikha Agarwal  
Associate Professor  
Dr. RMLIMS, Lucknow

  
Dr. Sanjeev Gupta  
Professor  
KGMU, Lucknow  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

  
Dr. S.P. Singh  
Principal Professor  
Prayagraj Medical College  
M.L.N. Medical College  
Prayagraj

  
Prof. P.K. Das  
Chairman  
Technical specifications committee  
Clinical Subjects & others  
Head, Department of Anesthesiology & CCM  
DR RMLIMS, Lucknow

**Basic Operating Microscope: 364**  
Specifications

1. Field of illumination	3mm to 60 mm
2. Eyepiece lens	12.5 oculars
3. Inclination	-70 to +90 degree
4. Light source	LED
5. Focusing type	motorized
6. Filters/mode	Retro illumination/ uv / soft light/ daylight/ blue/ slit
7. Magnification steps	3 to 5
8. Total magnification	0.4 to 2.4x
9. Resolution	1680x1050
10. Depth of field management system	yes
11. Slit width	0.2, 2, 3, 4mm
12. Slit length	12mm
13. Optics	apochromatic
14. Zoom system	Motorized, continuous
15. Zoom ratio	1:6
16. Focus range	50-70mm
17. Stand/suspension arm	Stable and movable
18. Footpaddle control	yes
19. knob	sterilizable
20. ACCESSORIES	Minimum 5 bulb, extra cable and power cord, knob
21. warranty	5 years
22. Video Recording system with monitor for Operating Microscope	Yes,
A. Full High definition (HD) Medical Grade Camera With Built in HD recorder	yes
B. Picture Element:	3-chip, $\geq \frac{1}{2}$ inch type CMOS Full HD ( $\geq 1920 \times 1080$ ) & Horizontal Resolution should be $\geq 1000$ TV lines
C. Small and Light weight Camera Head unit With C-mount	yes
D. Recordingsystem	Yes, Hard drive
E. Recording slots, timings	1-2 slots, timing: 30 mins-1 hour
F. Built-in recorder should features modes	HQ 1920x1080@35Mbs or SP 1440x1080@25Mb/s
G. USB cable should be provided to transfer the Data to laptop or computer with the card.	Two, included
H. One HD software and hard ware with latest Feature store cord and edit the video	yes, as per international norms for presentations
I. outputs: composite, S-video, HD- SDI (2) , DVI, Component , MIC input	yes
J. Foot switch	yes
K. IT Bhard disc should be supplied	1-2, yes
L. Cablettoconnecttothecontrolunit	Sufficient length of cable as per indenter Requirement should be provided
M. control slike colour, brightness, contrast, light	yes

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*Department of Ophthalmology*  
K.G. Medical University  
Lucknow

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Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*Prof. P.K. D.*  
Professor & H  
Dept. of Anaesthesiology  
Dr. RMLIMS, Lucknow

N. LED monitor with rotation enabled stand/attachment	Yes, preferably touchscreen
O. High quality optics for crisp and clear image quality	yes
P. Should be conforming to strictest international standards.	yes
Q. Brand should be nationally acclaimed and preferable if internationally acclaimed.	yes

*Shikha*  
**Dr. Shikha Agarwal**  
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 Dr. R.M.L.I.M.S., Lucknow

*Prohima*  
**Dr. Prohima Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*S*  
 Professor  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

*S.P. Singh*  
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 Dept. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*P.K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & C  
 Dr. RMLIMS, Lucknow

# STEREO COAXIAL SURVIVAL OPERATING MICROSCOPE FOR OPHTHALMOLOGY

## MICROSCOPE:

- Compact microscope body with high quality & complete apochromatic Optics with 1:6 zoom ratio. Magnification factor 0.4X to 2.4X.
- Focusing range 50mm, Objective lens  $f=200\text{mm}$ , 65mm diameter.
- Binocular tube: Tiltable tube with integrated image inverter from OEM only. External inverter or third-party inverter not acceptable.
- Eye Pieces: 10X with +8D to -5 D compensator.
- Deep View: Depth of field management system for optimal depth perception & maximum light transmission.

## ASSISTANT MICROSCOPE:

Stereo-Co observation with inclined binocular tube for teaching purpose.

## ILLUMINATION:

- Stereo Coaxial Illumination system for unique detail recognition, high contrast & stability of red reflex even with strongly pigmented decentered and ametropic eye.
- Retina Protection Device and contrast enhancement aperture.
- Integrated 408nm UV barrier filter & Blue blocking filter.

## X Y COUPLING:

- X-Y Coupling with 60mm x 60mm adjustable range.
- Motorized foot-controlled X-Y coupling with automatic re-centering and X-Y inversion facility.

## SUSPENSION SYSTEM:

- 14 function wireless foot control, Motorized foot-controlled Zoom and focus with re-centering of focusing position through foot control. Image inversion facility on foot control.
- High quality floor stands with long spring balance suspension arm with effective length of 1Metre or more having load bearing capacity of at least 14Kg or more.
- Stand should have touch screen LCD display with programming facility for setting the speed of XY, Zoom and focus, Foot Pedal.
- Stand should have cold light fiber Optic illumination 12v 100w Halogen lamp within built lamp housing with two lamps, automatic Lamp changeover facility in case of failure of main lamp.

*Dr. Shikha Agarwal*  
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MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*Dr. S.P. Singh*  
Professor

Dept. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*Prof. P.K. Das*  
Professor & Head  
Dept. of Anaesthesiology &  
Dr. RMLIMS, Lucknow

1. Full High definition (HD) Medical Grade Camera With Built in HD recorder	Yes
2. Picture Element:	3-chip, $\geq \frac{1}{2}$ inch type CMOS Full HD ( $\geq 1920 \times 1080$ ) & Horizontal Resolution should be $\geq 1000$ TV lines
3. Beam Splitter 20.	Yes
4. Small and Light weight Camera Head unit With C-mount	Yes
5. Recording system	Yes, Hard drive
6. Recording slots, timings	1-2 slots, timing: 30 mins-1 hour
7. Built-in recorder should features modes	HQ 1920x1080@35Mbps or SP 1440x1080@25Mb/s
7. USB cable should be provided to transfer the Data to laptop or computer with the card.	Two, included
8. One HD software and hard ware with latest Feature store cord and edit the video	yes, as per international norms for presentations
9. outputs: composite, S-video, HD- SDI (2), DVI, Component, MIC input	Yes
10. Foot switch	Yes
11. IT B hard disc should be supplied	1-2, yes
12. Cable to connect to the control unit	Sufficient length of cable as per indenter Requirement should be provided
13. control s like colour, brightness, contrast, light Intensity	Yes
14. LED monitor with rotation enabled stand/attachment	Yes, preferably touchscreen, size 32 inch
15. High quality optics for crisp and clear image quality	Yes
16. Should be conforming to strictest international standards.	Yes
17. Brand should be nationally acclaimed and preferable if internationally acclaimed.	Yes

WIDE ANGLED VIEWING SYSTEM: (from OEM).

- Wide angled non-Contact observation/ viewing system (autoclave able).
- field of viewing 120deg., Non-contact Lenses 68D & 128D.
- Both lenses should mounted & Interchangeable during surgery.

*Dr. Shikha Agarwal*  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Dr. Prolima Thacker*  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*Professor*  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*Dr. S.P. Singh*  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*Prof. P.K. Das*  
Professor & Head  
Dept. of Anaesthesiology &  
Dr. RMLIMS, Lucknow

# REQUIREMENT SPECIFICATIONS FOR ADVANCED SURGICAL OPERATING ZOOM MICROSCOPE FOR OPHTHALMOLOGY

## Main Microscope :

- Apochromatic optics with anti-reflex multi coating
- Motorized zoom system with zoom ratio 1:6 V magnification factors : 0.4x-2.4x
- Focusing range 70 mm
- Speed control for zoom and focus
- Tilttable binocular tube  $f=170$  mm with integrated automatic image inverter in VR/ Cataract surgery, interpupillary distance adjustable from 55mm to 75mm
- Pair of high eyepoint widefield eye pieces 12.5x with diopter setting from -8D to +5D,
- Apochromatic objective  $f=200$  mm
- Total magnifications: 4.3x to 25.5x with eyepiece 12.5x and objective lens  $f=200$ mm with carrier ring.
- Field of view: 8.6 mm to 51.8 mm with eyepiece 12.5x and objective lens  $f=200$ mm
- Deep View depth of field management system
- Integrated Slit illumination; Slit width 0.2, 2.0, 3.0, 4.0mm & Slit height 12mm.
- Beam splitter should be integrated in the microscope body for additional future upgrade (Stereo co observation attachment/ documentation)
- 3 CCD Full HD camera should be integrated in the microscope body without any external attachment C mount & cables. Camera controls unit should be integrated in the stand, Camera software should be integrated with microscope software.

## Built-in assistant's Microscope :

- Independent assistant scope with contentious Zoom magnification changer & Separate fine focusing system
- Inclinable Binocular tube with Automatic integrated image inverter for Cataract & VR surgery.
- SCI (Stereo coaxial illumination) for both main surgeons. & Assistant microscope for constant brilliance and brightness, red reflex illumination and surrounding field illumination both are adjustable.
- Pair of high eye point wide field eye pieces 12.5x with diopter setting from -8D to +5D,
- Provision of red reflex for assistant with equal brightness

## XY Coupling

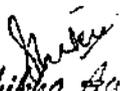
- Range of adjustment 60 mm x 60 mm. Control of automatic reset of XY movements.
- Provision of inversion of XY direction of travel via foot control, Speed control for XY.

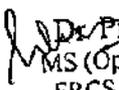
## Illumination

- Fiber light guide, LED illumination system . Fiber cable should be internally rooted. (External not acceptable)
- Integrated 408 nm UV filter for protection against infrared exposure
- Wireless programmable 14 function foot control panel.
- Blue Blocking Filter, Provision of retina protection device
- Provision of system of magnetic clutches for all locks for positioning of microscope across surgical field

## Floor Stand

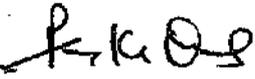
- Magnetic clutches for effortless movement and positioning
- Built in maneuvering programmable handles
- Lamp intensity adjustment, on/off via foot control panel
- Progressive speed adjustments

  
Dr. Shikha Agarwal  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Prolima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

  
Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

  
Dr. S.P. Singh  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & C.  
Dr. RMLIMS, Lucknow

... magnification, motor speed, configuration of foot control panel, lamp brightness and focal plane for at least 9 different users

- Facility for nonsterile release of suspension arm

Accessories for VR Surgery:

- Wide angle fundus viewing system with foot controlled electrical vario focus unit in VR surgery without moving microscope body.
- lenses 60D & 128D mounted on system & ready to use any time during surgery ( no changeover required during surgery) .
- Safety range 110mm.
- Rotation of aspheric lens holder 0 -360 Deg.

Assistance Markerless Toric Alignment / Licensae:

- Reference Axis, Capsulorhexis, Main Incision & Paracentesis, LRI, Z ALIGN®, Marker based & Marker less
- Z ALIGN, Target axis for Toric IOL alignment.
- Keratoscope function for intraoperative assessment of the corneal curvature
- Facility to import patient data from IOL Master 700/ IOL Master 500 through USB.
- One or three lines, Position relative to yellow reference axis
- HD Video Recorder should be integrated in microscope
- IDIS facility- Superimpose assistance function in the Eye piece.

*Shikha*  
**Dr. Shikha Agarwal**  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Prof. Thacker*  
**Prof. Thacker**  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*Prof. K.G.*  
**Professor**  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*Dr. S.P. Singh*  
**Dr. S.P. Singh**  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*Prof. P.K. Das*  
**Prof. P.K. Das**  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

- 01. Jaeger lid plate
- 02. Meyerhofer chalazion curette size 0, 1.50mm Dia
- 03. Meyerhofer chalazion curette size 1, 1.75mm Dia
- 04. Meyerhofer chalazion curette size 2, 2.25mm Dia
- 05. Meyerhofer chalazion curette size 3, 3.0mm Dia
- 06. Eye scissors curved 4 1/2" length
- 07. St. Martin suturing forceps, 1x2teeth
- 08. Hunt chalazion forceps, 12mm Dia
- 09. Desmarres chalazion forceps 13mm/20mm Dia
- 10. Castro Viejo N. Holder std jaws curved with lock
- 11. Bard-Parker blade #11
- 12. Bard-Parker handle #3 round handle
- 13. Plastic sterilization box with silicon mat

*Shikha Agarwal*  
**Dr. Shikha Agarwal**  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*Dr. P. Singh*  
**Dr. P. Singh**  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*P.K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

*Prof. K.G. Medical University*  
**Professor**  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

BASIC: Stainless Steel  
ADVANCED : Titanium

LACRIMAL(DCR) SET

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01. Stevenson lacrimal sacretractor, 3x3 blunt prongs
02. Knappa crines acre tractor blunt
03. Desmarest lid retractor size 0
04. St. Martinsuturingforceps, 1x2teeth
05. Wills hospital utility forceps
06. Hartman mosquito forceps curved
07. Halsted mosquito forceps straight
08. West cott stitch scissors
09. Eye scissors straight 4 1/2" length
10. St evens tenotomy scissors curved
11. Kalt needle holder straight
12. Barraquer N Holder short mode Im. Jaws, w/o lock
13. Castroviejo blade breaker and holder, big
14. Kerrison bonenib blingronguer size 0, 1, 3
15. Beyer bone nibbling ronguer single action
16. Nasal speculum infant
17. West lacrimal chisel straight
18. West bonegouge
19. Mallet for DCR
20. Free rperiosteal elevator
21. Traquairperiosteal elevator
22. Pigtailprobewithsuture holes
23. Bowmanlacrima probe set, malleable stainless steel
24. Castroviejolacrimal dialator (double end)
25. Westlacrimalcannulablunttipwithsideport
26. Muelleriacrimalsacretractor
27. Mc Pherson tying forceps St. Long handle
28. Fixation forceps 1x2teeth
29. Trephineprimaryandsecondary
30. Plastic sterilization box with sili conmat

*Shikha*  
**Dr. Shikha Agarwal**  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Prilima*  
**Dr. Prilima Thacker**  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*(S)*  
**Professor**  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

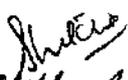
*S.P. Singh*  
**Dr. S.P. Singh**  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

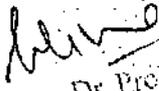
*P.K. Das*  
**Prof. P.K. Das**  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

EVISCERATION ENUCLEATION SET

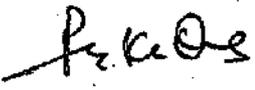
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1. Lancaster eye speculum
2. Graefe muscle hook size 1
3. Wells Enucleation spoon
4. Elschmigfixation forceps 1x2 angled teeth
5. Halsted mosquito forceps curved
6. Stevens tenotomy scissors curved
7. Enucleation scissors (st) and curved
8. Iris scissors, straight
9. Scoop
10. Suture tying
11. Needle holder
12. Plastic sterilization box with silicon mat

  
Dr. Shikha Agarwal  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Prejina Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. S.P. Singh  
Professor  
Dept. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

BASIC: Stainless Steel  
ADVANCED: Titanium

GLAUCOMA SET

1. Barraquer wire speculum, large.
2. Tooke corneal knife
4. Castroviejo synchiae spatula, double ended
5. Colbriforceps 1 x 2 teeth 0.12mm
6. Eye dressing forceps straight
7. Jaffetying forceps smooth jaws with 5mm long platform curved
8. Hartman mosquito forceps straight
9. Hartman mosquito forceps curved
10. Baby Jones towel clamp
11. Castroviejo corneal scissors small blades
12. Westcott stitch scissors
13. Vannas capsulotomy scissors, curved
14. Vannas capsulotomy scissors, 11mm angled
15. Eye scissors curved 4 1/2" length
16. Stevenstomy scissors curved
17. Bard-Parker handle #3 flat
18. Kelly Descemet membrane punch, 1.0mm
19. Harmstrabeculotomy probe right
20. Harmstrabeculotomy probe left
21. Rycroft air injection cannula 27G
22. St. Martin suturing forceps, 1x2teeth
23. McPherson corneal forceps st. 0.4mm 1x2teeth
24. McPherson IOL forceps, 11mm angled
25. Hydrodis section cannula 26G
26. Muscle hook
27. Needle holder
28. Caliper
29. Plastic sterilization box with silicon mat

*Shikha*  
**Dr. Shikha Agarwal**  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Prilima*  
**Dr. Prilima Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*(S)*  
 Professor  
 Department of Ophthalmology  
 K.C. Medical University  
 Lucknow

*S.P. Singh*  
**Dr. S.P. Singh**  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*P.K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

BASIC: Stainless Steel  
ADVANCED: Titanium

CORNEAL TRANSPLANT SET

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**A: PENETRATING KERATOPLASTY**

01. Barraquer wire speculum, large
02. Flieringa scleral fixation ring (set off 8 sizes)
03. Paton spatula & spoon
04. Castroviejo corneal trephine size 7.5mm Dia
05. Dastoor corneal graft holding forceps
06. Colibri forceps 1x2 teeth 0.12mm
07. McPherson corneal forceps, 0.4mm, 1x2 teeth
08. Castro Viejo eyelid lysis spatula, 0.50mm wide
09. Bishop-Harmon tissue forceps delicate 0.8mm
10. Dastoor keratoplasty spatula
11. Kelman-McPherson forceps 7.5mm angle long handle
12. Hartman mosquito forceps straight
13. Hartman mosquito forceps curved
14. Baby Jones towel clamp
15. Serrefine small straight
16. Castroviejocorneoscleral scissors[s] blade left
17. Castroviejo corneoscleral scissors[s] blade right
18. Castroviejo corneal scissors small blades
19. Westcott stitch scissors
20. Vannas capsulotomy scissors, 1 Immangled
21. Iris scissors straight 3.5" length
22. Barrique N. Holder short model micro jaws, without lock
23. Paufique graft knife
24. Rycroft air injection cannula 27G
25. Bracken A/C cannula curved 19G
26. Knoll anterior chamber irrigating cannula 23G
27. Bard-Parker handle #3 flat
28. Tudor Thomas corneal graft stand
29. Lieberman corneal cutting block Teflon
01. Plastic sterilization box with silicon mat

**B - ENDOTHELIAL SET (DSAEK SET)**

1. Corneal dissector, straight blade
2. Corneal dissector, vaulted blade
3. Busin endothelial glide
4. See through corneal trephine 8.5mm
5. See through corneal trephine 9.0mm
6. See through corneal trephine 9.5mm
7. Corneal transplant punch
8. Bore optic zone marker, 8.0mm
9. DSAEK glider
10. DSAEK stromal scrubber
11. DSAEK Descemet stripper
12. Reverse sins key hook
13. Rosenwasser lamellar donor inserting shovel
14. Donor lamellar inserting forceps
15. Iridectomy forceps straight

*Shilpa Agarwal*  
**Dr. Shilpa Agarwal**  
MS, (Ophthalmology)  
Asso. Professor  
Dr. P.M.L.I.M.S., Lucknow

*Prolima Thacker*  
**Dr. Prolima Thacker**  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*P.K. Das*  
**Prof. P.K. Das**  
Professor  
Dept. of Ophthalmology  
M.L.J.A. Medical College  
Lucknow

*P.K. Das*  
**Prof. P.K. Das**  
Professor & Head  
Dept. of Anaesthesiology & C  
Dr. RMLIMS, Lucknow

*Dr. P.K. Das*  
Dept. of Ophthalmology  
M.L.J.A. Medical College  
Lucknow

17. Appasamy sterilization box with two silicone mats
18. Rosen was reirrigating endothelial stripper
19. Plastic sterilization box with silicon mat

### C- DEEP ANTERIOR LAMELLAR KERATOPLASTY (DALK) SET

1. DALK corneal dissector
2. Rosenwasser DALK Trisector
3. Bonfadini DALK spatula
4. Katzin corneal transplant scissors, left
5. Katzin corneal transplant scissors, right
6. Rosenwasser DALK cannula, 27G
7. DALK air injection cannula, 27G
8. Sterilization box with silicone mat

### D -DMEK SET

1. DMEK twin block
2. DMEK rake
3. DMEK large crystal spatula
4. DMEK small crystal spatula
5. Dextome DMEK/DSAEK spatula
6. DMEK cannula 23G
7. Plastic sterilization box with silicon mat

*Dr. Shikha Agarwal*  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Dr. Prolima Thacker*  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*Dr. S.P. Singh*  
 Professor  
 Dept. of Opt  
 M.L.N. Hospital  
 Prayagraj

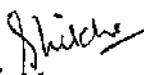
*Prof. P.K. Das*  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

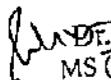
*Dr. ...*  
 ...  
 Lucknow

BASIC: Stainless Steel  
ADVANCED: Titanium

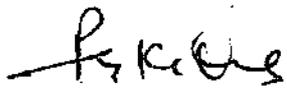
LENS implantation (ICL) SET 376

1. Jerome Bovert speculum reversible
2. Toric lens manipulator
3. Zaldivar lens manipulator
4. Pisacano hooks horizontal
5. Barra equerries spatula, 0.25mm, angled.
6. LRI slit lamp marker
7. Bonn forceps, long model, 0.12mm, 1x2teeth
8. Kirby Iris forceps, curved, 1.5mm, 1x2teeth
9. St. Martin suturing forceps, 1x2teeth
10. Dastoor superior rectus forceps, 1x2teeth
11. Faulkner lens holding forceps
12. DSEK inserting forceps
13. Kreshnermi croincisioncapsulorhexis forceps, curved20G
14. Lens cartridge loading forceps, straight20G
15. Iridectomy forceps
16. Vannas capsulotomy scissors, curved
17. Vitreous scissors 20G, 30°angled jaws
18. Pearce hydro dissection cannula, 35°angled27G
19. Silicone bulb with adaptor
20. Plastic sterilization box with silicone mat

  
Dr. Shikha Agarwal  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Protima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. S.P. Singh  
Professor  
Dept. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

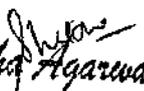
  
Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

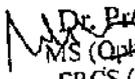
BASIC: Stainless Steel  
ADVANCED: Titanium

LID surgery SET

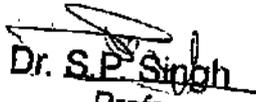
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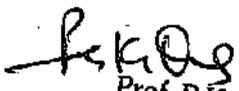
01. Lancaster eye speculum
02. Desmarres lid retractor size 0
03. Jaeger lid plate
04. Fixation hook double sharp 2.0x1.5mm small
05. Graefe muscle hook size 3
06. Meyerhoefer chalazion curette size 2
07. St. Martin suturing forceps, 1x2 teeth
08. Fixation forceps 1x2 teeth
09. Beerellia forceps
10. Berkeptosis forceps 20mm
11. Snellen entropion forceps left small
12. Snellen entropion forceps right small
13. Ayer chalazion forceps
14. Lambert chalazion forceps
15. McPherson tying forceps st. Long handle
16. Hartman mosquito forceps straight
17. Hartman mosquito forceps curved
18. Westcott stitch scissors
19. Eye scissors curved 4 1/2" length
20. Stevens tenotomy scissors curved
21. Kalt needle holder straight
22. Barraquer N. Holders short model m. Jaws, w/o lock
23. Bard-Parker handle #3 flat
24. Fixation forceps-2x3 teeth angular
25. Castroviejo corneal scissors small blades
26. Allis tissue forceps small-qty 2
27. Kockers tissue forceps
28. Caliper
29. Plastic sterilization box with silicon mat

  
Shikha Agarwal  
MS, (Ophthalmology)  
Asso. Professor  
R.M.L.I.M.S., Lucknow

  
Dr. Profima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

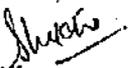
  
Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

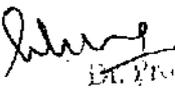
  
Dr. S.P. Singh  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

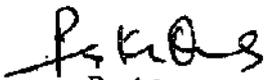
BASIC: Stainless Steel  
ADVANCED : Titanium

- 01. Barraquer wire speculum, large
- 02. Desmarre slid retractor size 0 and 2
- 03. Golf club foreign body spud
- 04. Beercilia forceps
- 05. Jewelers forceps standard
- 06. Lacrimal cannula, 23G, straight
- 07. Suturetying
- 08. Sterilization box with silicone mat

*Shikha*  
  
**Dr. Shikha Agarwal**  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Pradina Thacker*  
  
**Dr. Pradina Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*S.P. Singh*  
  
**Dr. S.P. Singh**  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*P.K. Das*  
  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

*KS*  
  
**Professor**  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

BASIC: Stainless Steel  
ADVANCED : Titanium

01. Kratz-Barraquer wire speculum, big and small
02. Self retaining Castroviejo eye speculum
03. Sinskey II lens manipulating hook angled
04. Akahoshinucleus ball sustainer
05. Castroviejo cyclodialysis spatula, 0.50mm wide
06. Shepard fixation ring
07. Agarwal phaco chopper 1mm fully cutting edge
08. Lim's corneoscleral forceps 0.12mm, 1x2teeth
09. Bishop-Harmon tissue forceps delicate 0.8mm
10. lens folding forceps
11. lens inserting forceps cross action
12. McPherson tying forceps St. Long handle curved and straight both
13. Utrata capsulorhexis forceps, long straight shanks, flat handle
14. Castroviejo corneal scissors small blades
15. West cott stitch scissors
16. Vannas capsulotomy scissors, 11mm angled
17. Eye scissors straight 4 1/2" length
18. Kalt needle holder straight
19. Barraquer N. Holder short model micro jaws, without lock
20. Rycroftair injection cannula, 23G
21. Anterior chamber wash out cannula 16G
22. Pearce hydrodis section cannula, 35°, Angled 25G
23. Gimbel 'U' shaped hydrodissector, 25G
24. Kellan hydro delineation cannula curved bevel tip 25G
25. Simeof/Acannula 23 G direct
26. Iris claw lens forceps
27. Plastic sterilization box with silicon mat

*Shikha Agarwal*  
**Dr. Shikha Agarwal**  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Pratima Thacker*  
**Dr. Pratima Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*S.P. Singh*  
**Dr. S.P. Singh**  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*P.K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

*Q*  
**Professor**  
 Department of Ophthalmology  
 K.G. Medical University,  
 Lucknow

## PTERYGIUM SET

BASIC: Stainless Steel  
 ADVANCED: Titanium

01. Castroviejo eye speculum
02. Paufigue graft knife
03. Paton corneal dissector
04. Castroviejo Needle Holder eli. Jaws curved without lock
05. Bonaccoutility forceps 1.2mm wide
06. Green fixation forceps 10mm wide jaws
07. St. Martin suturing forceps, 1x2 teeth
08. Knappstrabismus scissors curved
09. Iris scissors straight 3.5" length
10. Plastic sterilization box with silicon mat

*Dr. Shikha Agarwal*  
 Dr. Shikha Agarwal  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Dr. Prolima Thacker*  
 Dr. Prolima Thacker  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*Dr. S.P. Singh*  
 Dr. S.P. Singh  
 Professor  
 Dept. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*Prof. P.K. Das*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

*Professor*  
 Professor  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

BASIC: Stainless Steel  
ADVANCED: Titanium

### A. LIMBAL RELAXATION INCISION(LRI) SET

1. JeromeBovert speculum reversible
2. Bahr-Maltzman no hole IOL manipulating hook
3. Mendez degree gauge
4. Maloney intra-operative keratometer
5. Marking pen, fine tip
6. RI slit lamp marker
7. LRI marker, 6mm & 8 mm chord lengths
8. LRI marker, 40-60-80 degree
9. Pre-op Toric reference marker with bubble level
10. LRI axis marker
11. Bonn forceps, long model, 0.12mm, 1x2teeth
12. Kremer corneal fixation forceps, curved
13. Faulkner lens holding forceps
14. Plastic sterilization box with silicone mat

### B. FEMTO SECOND CATARACT SET

1. Jerome Bovert speculum reversible
2. Sladefem to second spatula
3. Akahoshi Nucleus splitter forceps
4. I/A Probe-I/A Tip S-Curved, polished
5. Slade fem to second cannula
6. Sterilization box with silicone mat

### C.-LASIK RETREATMENT SET

01. Lieberman aspirating speculum, temporal
02. LASIK flap lifter
03. Grandon T-Incision marker, size 2.5mm wide
04. Marking pen, fine tip
05. Nichamin LASIK irrigating cannula, 6mm, 23G

### D-PHAKIC LENS SET

01. Bahr-Maltzmannohole IOL manipulating hook
02. Faulkner lens holding forceps
03. Kershner microincision capsulorhexis forceps, curved 20G
04. Viterousscissors 20G, 30° angled jaws
06. Plastic sterilization box with silicon mat

### E-FEMTO SECOND LASIK SET

01. Lieberman irrigating speculum, temporal
02. LASIK flap lifter

*Dr. Shashi Kumar*  
Dr. Shashi Kumar  
MS (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Dr. Prolima Thacker*  
Dr. Prolima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*Dr. S.P. Singh*  
Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*Dr. S.P. Singh*  
Professor  
Dept. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*Prof. P.K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCU  
Dr. RMLIMS, Lucknow

- 03. Corneal marker
- 04. Buratto LASIK flap protector
- 05. Thoriakson LASIK flap lifter
- 06. Buratto LASIK flap forceps
- 07. Buratto LASIK cannula 23G
- 08. Sterilization box with silicone mat

**F-INTRA CORNEAL STROMALRING (ICSR) SET**

- 01. Mendez degree gauge
- 02. Tunnel zone marker
- 03. Optical zone marker
- 04. ICSR tunnel marker left
- 05. ICSR tunnel marker right
- 06. ICSR tunnel marker double ended
- 07. Elevator for ICSR implantation
- 08. Suarez spreader
- 09. Bicalto guide
- 10. Nevyas-Wallace fixation forceps
- 11. Forceps for ICSR implant
- 12. Plastic sterilization box with silicon mat

**G-TORIC IOL SET**

- 01. Zaldiver lens Manipulator double ended
- 02. Pallikaris lens manipulator
- 03. Henderson alignment marker
- 04. Mendez degree gauge
- 05. Henderson Toric IOL marker
- 06. Marking pen, fine tip
- 07. Whitehouse gravity axis marker II
- 08. Toric IOL combo marker
- 09. LRI marker 6 & 8 mm chord length
- 10. LRI marker 40-60-80 degree
- 11. Pre-op Toric reference marker, with bubble level
- 12. Henderson MICS capsule polisher, 23g
- 13. Plastic sterilization box with silicone mat

*Shilpa Agarwal*  
 MS, (Ophthalmology)  
 Asso. Professor  
 R.M.L.I.M.S., Lucknow

*[Signature]*  
 Dr. Prolima Thacker  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*[Signature]*  
 Dr. S.P. Singh  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*[Signature]*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

*[Signature]*  
 Department of Ophthalmology  
 R.G. Medical University  
 Lucknow

**Stich removal set**

1. Barraquer wire speculum, large
2. St. Martin suturing forceps, 1x2teeth
3. Sterilization box with silicone mat
4. Bard parker handle
5. Corneal scissors
6. Plastic sterilization box with silicone mat

*Shikha*  
**Dr. Shikha Agarwal**  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Pratima*  
**Dr. Pratima Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*S.P. Singh*  
**Dr. S.P. Singh**  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*P.K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

*Prof. K.G.*  
**Professor**  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

Strabismus set (SQUINT SET)

BASIC: Stainless Steel  
ADVANCED: Titanium

01. Barraquer wire speculum, large
02. Lancaster eye speculum
03. Desmarre slid retractor size 0
04. Graefe muscle hooks size 1
05. Graefe muscle hook size 2
06. Jameson muscle hook small
07. Jameson muscle hook large
08. Fixation forceps 1x2 teeth
09. Wills hospital utility forceps
11. James on muscle forceps left child 4 teeth
12. James on muscle forceps right child 4 teeth
13. Worth advancement forceps left
14. Worth advancement forceps right
15. McPherson tying forceps St. long handle
16. Keiman-Mc Pherson forceps 7.5mm angle long handle
17. Hartman mosquito forceps straight
18. Hartman mosquito forceps curved
19. Baby Jones towel clamp
20. Serrefine small straight
21. Steven sternotomy scissors curved
22. Knapp strabismus scissors curved
23. Barraquer N. Holder short mode 1m. Jaws, w/o lock
24. Bard-Parker handle #3 flat
25. Bishop-Harmon tissue forceps delicate 0.8mm
26. Plastic sterilization box with silicon mat

*Shivika*  
Dr. Shivika Agarwal  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*h*  
Dr. Prohima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*S.R. Singh*  
Dr. S.R. Singh  
Professor  
Dept. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*P.K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

*G*  
Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

VITRECTOMY SET (VITREO-RETINAL POSTERIOR SEGMENT SET)

BASIC: Stainless Steel  
ADVANCED : Titanium

- 01. Tapered extrusion hand piece cannula
- 02. Charles flute needle cannula
- 03. Scleral plug holding forceps
- 04. Infusion cannula 2.5mm, Beve led tip
- 05. 45 Diopter irrigating contact lens
- 06. 90 Diopter irrigating contact lens
- 07. Membrane peeler
- 08. May 30° bent needle
- 09. Scleral plug, 18G
- Scleral plug, 19G
- 11. Scleral plug, 20G
- 01. Clarke eye speculum small
- 02. Schepens scleral depressor small #8
- 03. Glass Retinal detachment hook
- 04. Colibri forceps 1x2 teeth 0.12mm
- 05. Bishop-Harmon tissue forceps delicate 0.8mm
- 06. St. Martin suturing forceps, 1x2 teeth
- 07. Willshospital utility forceps
- 08. McPherson tying forceps straight long handle
- 09. McPherson IOL forceps, 11mm angled
- 11. Hartman mosquito forceps straight
- 12. Hartman mosquito forceps curved
- 13. Vitreous forceps 20 G smooth jaws, straight
- 14. Westcott stitch scissors
- 15. Vannas capsulotomy scissors, curved
- 16. Vitreous scissors 20G straight
- 17. Eye scissors curved 4 1/2" length
- 18. Kalt needle holder straight
- Barraquer N. Holder short model microjaws, w/o lock
- 20. Rycroft air injection cannula 27G
- 21. Bishop-Harmon anterior or chambers cannula 19G
- 22. McPherson corneal forceps, 0.4mm, 1x2 teeth
- 23. Graefe Muscle hook size 3
- 24. Jameson muscle hook large
- 25. Schepens forked orbital retractor
- 26. Bard-Parker handle #3 flat
- 27. Plastic sterilization box with silicon mat

*Dr. Shikha Agarwal*  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Dr. Prolima Thacker*  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*Dr. Anurag*  
 Department of Ophthalmology  
 R.M.L.I.M.S., Lucknow

*Dr. S.P. Singh*  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*Prof. P.K. Das*  
 Professor & Head  
 Dept. of Anaesthesiology & CCU  
 Dr. RMLIMS, Lucknow

## BASIC A SCAN BIOMETER

Product Name	A-Scan
Purpose	A-Scan (Amplitude Scan), is a diagnostic ultra sound device used in ophthalmology to measure the axial length of the eye.
Performance parameter	
Portability	Yes
Eye type to be measure	A phakic, Phakic, Dense Cataract, Pseudo-PMMA, Pseudo Acrylic, Pseudo Silicone, Silicon Filled
Silicon oil filled eye	Yes
Post refractive eye surgery	Yes
Scan mode	Manual Automatic
Scan probe	Solid Tip
Availability of soft touch scan probe	Yes
Scan Probe frequency in MHz	10
Fixation light	Internal LED
Measurement provided	Axial length, Anterior chamber depth, Lens thickness
IOL calculation program available	HOLLADAY1, Thermotic/TBINKHORST, SRK II, HOPFER-Q, Haigis, HaigisL
Display screen	Touch screen
A scan should be digital and easy to use touch screen with high resolution with extreme reliability and accuracy	Yes
Provision to store A-scan images and corresponding IOL data	Yes
Provision to take minimum 5 scans with calculation of average axial length and standard deviation automatically	Yes
Power Supply sources	Single Phase(230V,50Hz)
Compatible online UPS provided	Yes
UPS back up time in minute	30
Type of printer provided	Thermal graphic printer
Immersion A-scan Probe	Yes
Provision of Upgradable to Pachymetry probe	Yes
<b>ACCURACY PARAMETERS</b>	
Accuracy in mm	±0.1
Minimum measurement range in mm	15 to 40
<b>ACCESSORIES- PAPER ROLL</b>	
Printer Paper roll	10
Foot switch	1
Power cord	Power cord 3 meter or more with Indian Plug
Dust cover	1
Spare fuse	5
<b>CERTIFICATIONS</b>	
Compliance to Medical Device Rules (MDR) 2017 as amended till date	Yes
Availability of valid Medical Device	Yes

Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*Dr. Pradima Thacker*  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.I.L.M.S., Lucknow

*Dr. S.P. Singh*  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*Prof. P.K. Das*  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

*Shikha Agarwal*  
MS, (Ophthalmology)  
Asso. Professor  
R.M.L.I.M.S., Lucknow

competent authority defined under Drugs and Cosmetic Act 1940 and Rules made there under as amended till date	
Valid Medical Device License Number	MFC/ MD/ 2023/ 000049
Certification for manufacturing unit	ISO: 13485 (Latest)
Availability of Test Report for each supplied batch/product as per Medical Device Rule (MDR) 2017 as amended till date	Yes
Submission of all necessary certifications, licenses and test reports to the buyer at the time of bid submission or along with supplies as per buyer requirement	Yes
Electrical Safety	IEC60601-1-2orEquivalentBIS
<b>WARRANTY</b>	
Warranty in Years (Option of comprehensive warranty is available through bidding only, which if opted will supersede normal warranty in the catalogue)	5
Additional Requirement-	paper roll 10

Dr. *Shikha Agarwal*  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Pratima Thacker*  
Dr. Pratima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*B*  
Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*S.P. Singh*  
Dr. S.P. Singh  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*P.K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**ADVANCED A SCAN**

Biometry Probe Internal fixation Measurement value  Accuracy Range Minimum calculation step Built-in IOL formula	10 MHz solid probe LED (red) Axial length, Anterior chamber depth, Lens thickness, Vitreous body length 0.1 mm 12 to 40 mm 0.01 D BINKHORST, HOLLADAY, SRK, SRK II, SRK/T, HOFFER Q
Pachymetry Probe Accuracy Range Minimum Measured part	10 MHz solid probe 5µm 200 to 1300 µm 1 µm Corneal thickness up to 25 points can be memorized.
IOP correction	Available
Display	Color LCD, 8.4-inch, TFT (XGA:1024 x 768)
Printer	Thermal type line printer (easy) loading and auto cutter)
Interface	USB memory (1.1), LAN, RS-232C for KM communication
Power supply	AC 100 to 120V 10%, 230 V 10%, 50 / 60 Hz
Power consumption	70 VA
Dimensions / Weight	300 (W) x 285 (D) x 330 (H)mm / 8,5 kg.
Standard accessories	Stylus, A-scan probe (14610-E310), Foot switch, Test piece (for Biometry measurement), Printer paper, Power cord, Dust cover, Spare fuse, Probe rest
Optional accessories	Pachymetry probe (45 Deg. Fixed type), Pachymetry probe (45 Deg. Detachable type), Pachymetry probe (straight type), Test piece for 45 Deg. Pachymetry probes, Test piece for straight pachymetry probe, Probe stand, Barcode reader, Magnetic card reader, IOL calculation formula (Hagis), RS-232C cable
CERTIFICATIONS	USFDA / EUPEAN CE APPROVED

*S. Shukla*  
**Dr. Shikha Agarwal**  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Dr. Arvind Thacker*  
**Dr. Arvind Thacker**  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*Dr. S.P. Singh*  
**Dr. S.P. Singh**  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*Prof. P.K. Das*  
**Prof. P.K. Das**  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

*Dr. G. K. Singh*  
**Dr. G. K. Singh**  
Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

- OCT scanning: Axial Resolution  $\geq 5\mu\text{m}$ 
  - Transverse resolution  $\geq 12\mu\text{m}$
  - Scan speed:  $\approx 25000$  A-scans per second
  - Field of view:  $36^\circ$  degrees x  $30^\circ$  degrees
- Optical Source: SLD 840nm
- Fundus imaging: Live scanning & digital fundus reconstruction using 3-DSOCT Data Transverse resolution  $25\mu\text{m}$  (in tissue)
- Fixation: Internal & External both macula & Disc
- Focus adjustment -20D to +20D
- RNFL thickness Analysis
- Pupil size: 3mm
- Computer: Later available with  $\geq 80000$  scans
- Topo graphic maps of retina Thickness
- RPE Analysis mode
- RNFL Thickness graph for optic nerve area
- Normative data for RNF Analysis

*Dr. Shikha Agarwal*  
 Dr. Shikha Agarwal  
 MS. (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Dr. Krishna Thacker*  
 Dr. Krishna Thacker  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*CS*  
 Professor  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

*Dr. S.P. Singh*  
 Dr. S.P. Singh  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*Prof. P.K. Das*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

330  
**ADVANCED OCT MACHINE**  
 (Optical Coherence Tomography)

Methodology	Spectral Domain OCT
OCT Scanning	Axial resolution: 5um (in tissue), 1.95um (digital) Transverse resolution: 15 um (In tissue)  Scan speed: 100,000A-Scansper second A-scan depth: 2.0mm-2.9mm(in tissue)
Fundus Imaging	Optical Source: luminescent diode (SLD), 840 nm Line Scanning Laser Ophthalmoscope (LSO) Transverse Resolution: 15 um (in tissue) Optical source: 750 super luminescent diode (SLD). Field of view: 36 degree x 30 degree
Posterior Segment Scans	OCT :Cube scan (Macula and Optic Disc) HD Raster (1,5,21- line, cross and radial); Raster scan length 3-12 mm; Image averaging upto 100x
Anterior Segment Scans	Cube, HD Cornea, Pachymetry, HD Angle, Wide Angle-to-Angle, Anterior Chamber, 5-Line Raster
Applications	<b>GLAUCOMA:</b> Ganglion Cell/IPL Thickness with Reference Database (Diversified and Asian), RNFL Thickness with Reference Database (Diversified and Asian), ONH Parameters with Reference Database (Diversified and Asian), Average cup-to-disc ratio, Average, Superior and Inferior RNFL Thickness Should provide both trend and event based analysis to detect statistically significant change and should be able to quantify the rate of change for RNFL, ONH and GCL Parameters.

*Dr. Shikha Agarwal*  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Dr. Pradipta Thacker*  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

  
 Department of Ophthalmology  
 R.M.L.I.M.S. Medical University  
 Lucknow

*Dr. S.P. Singh*  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*Prof. P.K. Das*  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

	<p><b>RETINA:</b> Thickness Analysis with Reference Database (Diversified and Asian), Macular Change Analysis, Advanced RPE Analysis, 3D Visualization, En Face Analysis</p> <p><b>ANTERIOR SEGMENT</b> 9 mm Epithelial Thickness and Pachymetry Mapping, HD Cornea with Cornea Caliper Tool, Full Anterior Chamber Imaging for phakic IOL sizing and safety distance measurements, Angle imaging and measurement tools for Glaucoma (AOD, TISA, SSA)</p>
Software/normative data	<p>USFDA approved normative data base for RNFL, ONH &amp; MACULA. Macula thickness analysis and Macula change analysis, RNFL Thickness analysis and Progression analysis for RNFL, ONH and GCL/IPL parameters. C- Scan visualization, Minimum Intensity Projection in En Face Analysis and 3D display. Enhance depth imaging (EDI). Auto fovea finder, auto Disc center for Glaucoma. Single eye combined report of Macular thickness and RNFL thickness. Combination report of RNFL and Ganglion cell deviation maps.</p>
Software- additional requirement	<p>Percentile value for each sector thickness analysis. High-speed Eye tracking system Focus Adjustment Range-20D to +20D (diapers) Fixation Internal and External BOTH Computer with i7 or higher processor should be integrated in the system with at least 22" High Definition Widescreen Operating System should be latest Windows 10 Enterprise. High-performance multi-core processor Internal storage: 2TB with 128GB SSD External computer &amp; LCD display not acceptable. Pupil Size Requirements &lt;= 2.0mm DICOM Compliance/compatible.</p>
Certification	USFDA/EUROPEANCE

Dr. *Shikha Agarwal*  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

Dr. *Arvind Thacker*  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

Dr. *S.P. Singh*  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

Dr. *P.K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

# BASIC A/B SCAN (OPHTHALMIC ULTRASOUND WITH B-SCAN, A-SCAN AND PACHYMETER PROBES)

Technical specification and configuration

## B-scan Functions:

- a. Gain: gain Range -128dB to +128dB. TGC Near, Mid, Far (user adjustable slider).
  - b. B-scan probe: 12 MHZ (optional: 10MHZ, 20MHZ)
  - c. Scan angle: Angle Range 20 to 60 degree
  - d. Axial resolutions: range from 0.1 to 0.3mm
  - e. Lateral resolution: Range from 0.2mm to 0.5mm
  - f. Vector density and sampling: 256vectors×2048points
  - g. 256 Gray scale
  - h. Scan Depth: Scan modes to optimize image quality in area of interest including Retina.
2. Vitreous, Orbit
- a. View zone: view zone range 30 to 60mm
  - b. A/B scans capability: A-scan vector available as over lay on B-mode images.
3. Measurements tools:
- a. Caliper tool: we can measure any distance like Axial Lenth, Choroidal Thickness, etc..
  - b. Area: measure any foreign body or cyst
  - c. Text: To create Text on the Image.
  - d. Probe orientation: Mention the orientation on each image for easy diagnosis for glaucoma patient
  - e. Flood fill color: To differentiate the particular segment.
4. User Interface & Programmability:
- a. 24" HD Display
  - b. Real time video capture 600 frames per cine up to 10 videos per eye
  - c. Compatible with any EMR software
  - d. Report export format: JPEG, PDF, HTML, MHT, RTF, XLS, XLSX, CSV,
  - e. Image export format: PNG, IPEG, BMP, GIF, TIFF.
5. Electrical Specifications:
- a. Mains power: 110-230V AC, Frequency 50-60Hz, Power Rating 350 VA (MAX)
- Certification: The equipment must be ISO 13485, ICMED 13485 certified & CE certified

*Dr. Shikha Agarwal*  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Dr. Profima Thacker*  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*Professor*  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*Dr. S.P. Singh*  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*Prof. P.K. Das*  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

ADVANCED A/B SCAN (OPHTHALMIC ULTRASOUND WITH B-SCAN, A-SCAN AND PACHYMETER PROBES)

- (A) Main console with built in Color LCD 8.4" TFT monitor.
- Gain / TGC 0 to 90 db variable / 0 to -20db variable
  - Video output
  - USB memory interface
  - Foot switch / dust cover
  - Power 230V, 50Hz 1 Phase, 100VA
- (B) B - Scan
- B- mode probe 10 MHz transducer, 1550 m/s
  - 60-degree scan angle.
  - Scan depth: normal 35mm, Long 50mm
  - Sector line density: 400 lines
  - Zoom: X2.5, X5.0
  - Moving Image Record: 20 sec.
  - Scale: 256 grey scale
- (C) Biometry
- A-mode probe : 10 MHz Solid probe  
Internal fixation : Red LED  
Range : 12 ~ 40mm  
Accuracy : 0.1mm  
Minimum Calculation Step: 0.01D  
Measurement value: Axial length, Anterior chamber depth, lens thickness, vitreous body length  
Built-in IOL formula: BINKHORST, HOLLADAY, SRK, SRK II, SRK/T, HOFFER Q
- (D) Pachymetry with IOP correction
- Pachy probe : 10 MHz Solid probe (Straight & 45 deg. angled)
  - Accuracy : 5 microns
  - Range : 200 to 1300 micron
  - Minimum indicated unit: 1 micron
  - Corneal Thickness Value up to 25 points should be available with different patterns.
- (E) With Built In Thermal Printer

Key Features

Compact, Touch Panel Display, Tiltable Color LCD, Scanning 400 lines over 60 Deg. Displayed on 1024 x 768 XGA monitor.

Rapid, Accurate and Easy to use for dense cataracts and existing opacities, having option of Dense Cat Switch and Gate Switch.

USFDA APPROVED

Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

Dr. S. Singh  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

Dr. Prolima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

Dr. S.P. Singh  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

# Applanation tonometer

Type	Applanation Tonometer
Principle	Goldmann Tonometer
Measuring range	From 0 to 80mmHg
Accuracy	$\pm 0.5$ mmHg
Diameter of the pneumatic face	3.06mm
Probe carrier line specification	43°
Measurement	47mm wide x 30mm Deep x 85mm Height
Weight with accessories	800gm (approx)
Compatibility	Both for Zeiss & Hagg-Streit model slit lamps

## Standard Accessories

1. Calibration bar
2. Prism
3. Mount base (for head mount model only)

Compatible with slit lamp, 2 biphisms required

USFDA/EUROPEAN CE

*Shikha Agarwal*  
Dr. Shikha Agarwal  
MS. (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Prolima Thacker*  
Dr. Prolima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*S.P. Singh*  
Dr. S.P. Singh  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*P.K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## BASIC AUTOREFRACTOMETER

Product description	Auto Refractometer
Purpose	Auto Refractometer is an optical device used by eye care professionals to measure a person's refractive error and determine their prescription for glasses or contact lenses.
PRODUCT INFORMATION	
Eye fixation	Auto-fogging system
Alignment	Pupil rings
Change of magnification is until the image comes into focus	Yes
Spherical refractive measurable range (when VD = 12mm)	-20D to +20D
Step up increments of sphere measurement	0.25D
Cylindrical refractive measurable range	-10D to +10D
Step up increments of cylinder measurement	0.25D
Refractive measurable axis range (degree)	≤ 180
Step up increments of axis measurement	1 degree
KERATOMETRY READINGS	
Keratometry range	YES in 0.25 increments
Pupil distance maximum (PD) (mm)	34-58 ± 2 diopter
Step-up increments of PD (mm)	10-85 millimeters
Visual of vertex Distance (VD)(mm)	+/-1
Cylinder form	0,12,13.5
Minimum pupil dia (mm)	Yes
Measurement value for each eye	2 millimeter
Standard value for each eye	10
Display type	1
Display Size	LCD/LED
Vertically adjustable chin rest, range (mm)	5 inch
Printer Type	+/-25
Printing details	Built in printer
Built - in lamp for illumination, available	Measurements of each eye, date, time, Serial number and eye diagram
Power supply	Yes
Power saver mode	100-240V; 50Hz-60Hz
Motorized table	Entire system viz. Monitor, lamp and motor go into sleep mode when operation is discontinued for 5 minutes (approx)
CERTIFICATION	
	Yes
	ISO/ EUROPEAN CE

Dr. Shikha Agarwal  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

Dr. Profima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

Dr. S.P. Singh  
Professor  
Dept. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## ADVANCED AUTOREFRACTOMETER

Measurable Range	Sphere - 25.00D to +22.00D (VD=12 mm) (0.01 / 0.12 / 0.25D increments) Cylinder - 0D to $\pm$ 12.00D (0.01 / 0.12 / 0.25D increments) Axis 0 Deg. to 180 Deg. (1 Deg. / 5 Deg. Increments)
<b>KERATOMETRY READINGS</b>	<b>YES in 0.25 increments</b>
Keratometry range	34-58 $\pm$ 2 diopter
Minimum Measurable pupil diameter	2 mm
PD measurement range	30 to 85 mm (1mm increments) (Near point PD: 28 to 80 mm at WD=40 cm)
Pupil size measurement range	1.0 to 10.0mm (0.1mm increments)
Auto tracking & Auto Shooting	present
Chart	Scenery chart
Display	Tiltable 5.5-6.5 inch color LCD, touchscreen
Printer	Built-in-thermal type printer
Interface	RS-232C (In / OUT) LAN, USB, Eye care card system / Card is optional
Power supply	AC100 - 240 V $\pm$ 10% 50 / 60 Hz
Power Consumption	100 VA
Weight	20 kg
Additional features	Peripheral keratometry measurement, retroillumination function
<b>CERTIFICATION</b>	<b>EUROPEAN CE/ USFDA</b>

*Dr. Shikha Agarwal*  
MS. (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Dr. Prolima Thacker*  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*Professor*  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*Dr. S.P. Singh*  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*Prof. P.K. Das*  
Professor & Head  
Dept. of Anesthesiology & CCM  
Dr. RMLIMS, Lucknow

COLOR VISION CHART	
Generic	
Number of color test plate	24
Symbols	Dots
Type of plates	Hidden digit design
Usage	Test for red-green color Deficiencies, Eye Testing, COLOR DEFICIENCY, color screening for proton and Dotan defects
Color	Multi Color
Number of Special plates for tests to determine the kind and degree of defect	4
Language	
User manual Provided	Numeric
Type of binding	NA
Others	Album-type books
Weight	
Dimension	80-120gram
Features	APPROX 150 mm*100mm*50mm
Features	With normal color perception, specially printed to measure incrementally higher color sensitivity and specificity, with result analysis page, in two forms, complete and incomplete.
Warranty	5 year
Certificate	
Copies of reports and certifications to be furnished to buyer on demand at time of supplies	ISO/EUROPEAN CE/ USFDA YES

*Shikha*  
**Dr. Shikha Agarwal**  
 MS. (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Prilima*  
**Dr. Prilima Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*(S)*  
**Professor**  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

*S.P. Singh*  
**Dr. S.P. Singh**  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*P.K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

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**DIPLOPIA GOGGLES**

Purpose	Used to establish whether a patient has the ability for the eyes of use the light that is received from each eye into 4 lights
Item description	Diplopia Goggles work with Worth 4 Dot and other Anaglyph tests
Size	Free Size
Color	Red and Green

**Material and Design Specifications**

Lense material	Polycarbonate
Frame material	PVC
Adjustable strap	Yes
Ideal for	Adults/PEDIATRIC--1EACH
Shape	Circular

**Additional Information**

Weight	200 gram APPROX
Packaging Type	Pouch/BOX

*Shikha*  
**Dr. Shikha Agarwal**  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Prolima*  
**Dr. Prolima Thacker**  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*S.P. Singh*  
**Dr. S.P. Singh**  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*P.K. Das*  
**Prof. P.K. Das**  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

*KG*  
**Professor**  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

503

**BASIC FUNDUS CAMERA (FUNDUS PHOTOGRAPHY CAMERA without angiography)**

Purpose	To take an image of the fundus — the back portion of the eye that includes the retina, macula, fovea, optic disc and posterior pole and resulting image can then be used by an ophthalmologist/neurologist for diagnosis and treatment
Components of the digital fundus camera	Consists of a camera with a specialized microscope attached and either a lamp or flash provides the light necessary for photo taking, and depending on the camera photos at different angles of view from narrow to wide can be taken
Capture sensor	High resolution
Type of Digital Fundus camera	Both Mydriatic & Nonmydriatic
Digital camera shall Capture color, red-free and red pictures	Yes
Digital camera shall have Live visualization feature	Yes
Capture sequence	1.5 to 2 seconds (Depending on flash energy)
Availability of Compensation for Ametropia	Yes
Fixation mode	Both External & Internal programmable
Number of Fixation targets	7-10
Mode to operation for fixation target for internal should be automatic	Yes, LINE/DOTS or both
Auto Shoot Function-	yes
Autofocus Function-	yes
Focus range	-30D to +30D
Pupil diameter in normal mode in mm	4-5
Pupil diameter in small pupil mode in mm	3-4
Pixels	24 megapixels (minimum)
Image and video format	JPEG, DICOM, MPEG-4, MPEG-1, TIEF, BMP
Type of Light Source	INFRARED LED
Flash energy source	XENON FLASH LAMP
Number off lash levels	15 to 25
Flash light intensity should be low	Yes
Type of Display	LED
Mode of Connectivity to another device	USB
Image viewer and archive Software	Yes
Database	Patient in formation and image with field angle,

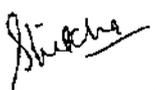
*Dr. Shikha Agarwal*  
MS, (Ophthalmology)  
Asst. Professor  
Dr. R.M.L.M.S., Lucknow

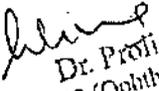
*Dr. Prolima Thacker*  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.M.S., Lucknow

*Dr. S.P. Singh*  
Professor  
Dept. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*Prof. R.K. Das*  
Professor & Head  
Dept. of Anaesthesiology & C  
Dr. RMLMS, Lucknow

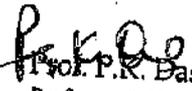
	R/L recognition and date of visit
Power Supply Source	230Volt50HZSinglePhase
Online UPS supplied with equipment	Yes
UPS backup time in minute	30
Facility to Compare different simultaneous image	Yes
Computer system Provided with camera	Yes
Processor in computer system	i7
RAM Capacity in GB for computer system	4
Hard disk in GB in computer system	1000
DVD and CD Writer Provided with system	Yes
Motorized table provided	Yes
Facility to access system through Internet browser	Yes, desirable
Warranty in years	5
Comprehensive Maintenance Contract (CMC) which includes preventive maintenance including testing & calibration as per technical/ service /operational manual, about and spares, after satisfactory completion of Warranty period	5years
Certificate to be available from OEM/principal regarding approved centers for servicing in India	Yes
Operating temperature range and humidity	0 to50 degree centigrade and humidity15-90%
Product should be made up of high-quality material, pretreated with materials providing good finish, scratch resistant, bacteriostatic coating	Yes
1 Set of Product instruction manual, Service manual and troubleshooting guide shall be supplied in original	Yes
Demonstration of equipment and training to be provided after completing supplies before Acceptance	Yes
CERTIFICATION	EUROPEAN CE/ISO

  
**Dr. Shikha Agarwal**  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

  
**Dr. Profima Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

  
 Professor  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

  
**Dr. S.P. Singh**  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

  
**Prof. P.R. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## ADVANCED FUNDUS CAMERA (FUNDUS PHOTOGRAPHY CAMERA without angiography)

### Specifications for Fundus Camera

1. Digital fundus camera technology (at least 5 Mega pixels or more) with Image processing software and facility to modify images and also measure, magnify and manipulate the images (must allow montage or composite photograph of fundus images by combining different photographs.). Must allow PDT measurements.
2. Field of view Angles 50, 30 and 20 degrees.
3. Telecentric optics with 3 independent telescopic systems
4. Non distortion of peripheral fundus images and ability to capture micro aneurysms in colour photograph through grade 3 cataracts or equivalent hazy media
5. Tilting angle + or - 45 deg horizontal and +15/-10 degrees vertical.
6. Working distance 42mm or more
7. Capture modes - Colour photography, red free, fundus autofluorescence, fluorescein angiography, ICG angiography & anterior segment.
8. Small pupil facility.
9. Diopter compensation facility +/- 30D
10. Flash recycling time 1 Per Sec
11. Response time in viewing the image on the monitor should not be more than 2 sec. after image capture.

### Data management.

- System should be windows based with minimum monitor display size of 19/21 inches and resolution of 1280 X 1024 pixels. Minimum 1000 GB hard drive with internal and external DVD writers supplied and USB port for data transfer. RAM minimum 3 GB or above, if higher specification is available. Must allow fast archiving at least 1 terabyte on, NAS drive
- Data export in all image formats such as tiff, Discom, jpeg. Facility to import or export Discom images to the system.
- Must allow visualization of raw image. Modification of raw image must not result in loss of raw image data and processed image should be saved separately and indicated as modified.
- Facility for networking and establishment (of electronic management system. This facility should be demonstrated at the time of user trial and technical evaluation. Company should be able to network 3 computers at time of technical evaluation and demonstrate import of images to and from the network. Must allow import and integration of OCT Images into the system
- CD writer and DVD writer. - DESIRABLE
- Facility for storage of data for at least 5000 patients
- Color Deskjet printer with cartridges and glossy photo papers. To be supplied along with 4 sets of cartridges and 500 sheets of glossy
- Xenon bulb or LED light source acceptable. Adjustable flash intensity and adjustable light source intensity, extra two bulbs should be supplied with the machine.
- Compatible online UPS-YES
- CERTIFICATION -USFDA/EUROPEAN CE

*Dr. Shikha Agarwal*  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Dr. Prolima Thacker*  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

Department of Ophthalmology  
K.G. Medical University  
Lucknow

*Dr. S.P. SINGH*  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*Prof. P.K. Das*  
Professor & Head  
Dept. of Anaesthesiology & CC  
Dr. RMLIMS, Lucknow

**GONIOSCOPES: (gonio lens)****A- Four mirror gonio lens (with flange) noncoupling-**

- 4x64° mirror angles
- 1.50x image magnification
- 0.67x laser spot size
- 15mm(flange)/8.4mm(no flange) contact diameter
- No Fluid version
- USFDA CERTIFIED

**B- Four mirror gonio lens (coupling) -**

- 4x64° mirror angles
- 1.0x image magnification
- 1.0xlaser spot size
- 15mm(flange)/8.4mm (no flange) contact diameter
- Coupling agent needed
- USFDA CERTIFIED

**C- Two mirror lens with coupling fluid-**

- Mirrors are inclined at 62 degree to the optical axis of the lens
  - 62°/62° mirror angles
  - 1.50x image magnification
  - 0.67x laser spot size
  - 15mm(flange)/8.4mm (no flange) contact diameter
  - USFDA CERTIFIED

**D. Three mirror - 3 MIRROR GOLDMAN**

- Ideal for Anterior, Peripheral and Equatorial Viewing
- light weight, acrylic design.
- The 3-Mirror Lens comes uncoated for diagnostic exams and coated for use with lasers,
  - 59° / 66° / 73° mirror angles
  - 0.90x image magnification
  - 1.11x laser spot size
  - 3 mm (no flange) / 18 mm (ANF+) contact diameter.
  - USFDA CERTIFIED

*Shikha*  
**Dr. Shikha Agarwal**  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Prolima*  
**Dr. Prolima Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

Department of Ophthalmology,  
 K.G. Medical University  
 Lucknow

*S.P. Singh*  
**Dr. S.P. Singh**  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*P.K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

# INDIRECT OPHTHALMOSCOPE (WITH +20 D LENS)

Sl. No.	Specifications
1.	Has all pupil features/size
2.	Bright halogen /LED illumination
3.	Stereo optical system compact light weighted
4.	Cobalt blue , yellow and green filters
5.	Adjustable inter Pupillary distance 52-75mm
6.	Illumination beam can be swivelled by $\pm 30^\circ$ $50^\circ$
7.	Synchronized adjustment of convergence parallax
8.	Focus distance 800-1000mm
9.	Illumination control- linear
10.	Headband - adjustable
11.	Preferably wireless
12.	Standard accessories :Three pencils, fundus chart pad Scleral depressor, transformer with power cord (charger)
13.	Three Bi-aspheric 20D lens two diagnostic and one therapeutic (International make) should also be supplied with it. Therapeutic lens should be coated to perform laser with posterior segment lasers
14.	Rechargeable Detachable batteries (with good battery backup), should be there so that patients can be seen without connecting to the power cable. Five extra bulbs/LED's should be supplied.
15.	<p><b>Equipment must have:</b></p> <ol style="list-style-type: none"> <li>1. High quality optics for crisp and clear image quality</li> <li>2. Should be conforming to strictest international standards.</li> </ol> <p>Brand should be nationally acclaimed and preferable if internationally acclaimed.</p>
16.	Warranty - 5 years
17.	CERTIFICATION- USFDA/EUROPEAN CE

*Shikha*  
**Dr. Shikha Agarwal**  
 MS. (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*P. Thacker*  
**Dr. Prolima Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*P. K. Das*  
**Professor**  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

*S.P. Singh*  
**Dr. S.P. Singh**  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*P.K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

# MADDOX ROD AND MADDOX WING

## A- MADDOX ROD

**PURPOSE** A Maddox rod is an optical device used in ophthalmology to assess and diagnose eye alignment and visual disorders, particularly those related to binocular vision and eye muscle coordination.

It should be made up of series of red, parallel, cylindrical lenses usually 3 mm in diameter mounted on trial frame of refractor head

Handle Material—Plastic/Steel /Aluminum/ Polycarbonate

Rim/handle in silver /GOLDEN luster--Yes

Lens color--Red /White/Green

Rim Body Material--Copper / Steel

Perfect for measuring horizontal and vertical deviations, in both near and distant vision

**CERTIFICATIONS- USFDA/EUROPEAN CE**

## B- MADDOX WING-

Should be of high quality material

**BLACK COATING ON METAL**

Convenient testing

**The Handle:** The handle is retractable and is located at the base of the instrument.

**The Eye Piece:** Located anteriorly,

**The Eye-piece lens holder:** Mainly used to hold lens for patients who have difficulties seeing the board with their glasses

**The Septa:** There are 2 septa that separates the eye piece so that the patient has two separate fields of view.

**The Scale Card:** Used to measure the deviation of heterophorias, small heterotropias (with NRC) and also torsion.

The scale card must have the horizontal, vertical and torsional scales.

The board must also contains the red and white arrows.

**The Torsion Lever:**

On the measuring board there should be adjustable lever which the patient subjectively aligns to measure torsion.

Weight approx 150-250 gms

*Dr. Shilpa Agarwal*  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.M.S., Lucknow

*Dr. Prolima Thacker*  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.M.S., Lucknow

*Professor*  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*Dr. S.P. Singh*  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*Prof. P.K. Das*  
Professor & Head  
Dept. of Anaesthesiology & CCU  
Dr. RMLIMS, Lucknow

## NEAR VISION CHART WITH DIFFERENT LANGUAGE

Product	Illuminated near vision test drum
Product technical features	
Light weight and non portable	Yes
Sturdy construction high durability and good finish	Yes
Operation mode	Manual
Test functional	Any five languages out of these-Number, Hindi, English, Urdu and Punjabi, cased test 25 to 33Cm
Distance to be maintained for performing Near vision test while the test drum hold by patient with right hand	Yes
Occlude one eye with Ocluder while test the other eye	Jaeger' chart
Test charts type for near vision test	
Electrical features	
Power Supply (main)	230.±10%, SinglePhaseAC, 50Hz
Source of illumination	White LED
Illumination on and off	Manual
<b>PACKING MODE</b>	
Unit should be supplied with high grade thermoform packing in card board box to avoid possible transit damage	Yes
<b>CERTIFICATIONS &amp; REPORTS</b>	
Compliance to Medical Device Rules (MDR) 2017 as amended till date	Yes
Valid Drug License Number/Registration Number	MH-YEO-467861
Manufacturing unit certification	ISO:13485(Latest)
Additional voluntary certification available	ISO30
Availability of test report for reach supplied batch/product as per Medical Device Rules (MDR) 2017 as amended till date	Yes
Submission of all necessary certification, licenses and test reports to the buyer at the time of bid submission and/or along with supplies as per buyer requirement	Yes

*Shikha*  
**Dr. Shikha Agarwal**  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Pratima*  
**Dr. Pratima Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*S*  
 Professor  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

*S.P. Singh*  
**Dr. S.P. Singh**  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*P.K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & C  
 Dr. RMLIMS, Lucknow

# BASIC PHACO MACHINE

## Ultrasound (U/S) :

- Must have a lightweight (less than 40 gms) 6crystal handpiece with ability to work on both Longitudinal & Transverse (orbital motion) ultrasound delivery modes. U/S Frequency of the handpiece 28 KHz . At least two handpieces to be provided with the basic configuration.
- Phaco Modes: Linear Continuous, Pulse, Micro Pulse, Burst, MBurst, Occlusion Pulse, Occlusion Micro Pulse
- U/S Power: 1-100%

## Fluidics:

- Positive Pressure with real time fluidics monitoring system for chamber maintenance.
- Automatic and Custom Setting IP Option
- Motorized IV pole to Increase & Decrease the IV bottle height
- Peristaltic Pump with Linear/ Non-Linear control of vacuum modes, Vacuum range : 5mm - 650 mm hg.
- FVP mode should be available
- Flow Rate: 1-50 CC/min (Linear/NON-Linear)
- Gas Forced Infusion, Facility for VFI - 10-50 PSI
- Equipment must work with Reusable/Auto clavable Tubing for use during surgical procedure

## Diathermy:

- Type: Bipolar, 500 - 600KHz frequency range with Power range of 1-7W(max)
- Control 5-100%(Linear/NON-Linear)

## Vitrectomy:

Vitrectomy Mode: Pneumatic (Guillotine)type cutter with Single 60-3000cuts per minute (Linear/NON-Linear) 20G, 23G, 25G cutter compatibility must be provided. In-Built Compressor for Anterior Vitrectomy must be provided (no external air / gas source)

## Programmability, User Controls & Display:

- 10 Independent user program modes, with voice assistance all important modes and functions.
- Footswitch: User programmable multifunctional foot pedal for angle & side buttons with reflux mechanism, Different step changes giving vibrating feedback to the surgeon
- Video Overlay: Equipment To be provided along with Video overlay unit & recording function enabled in all modes.
- Display: Tiltable & Anti-Glare Interactive soft touch clear LCD Display (19" or above) for Graphic User Interface - GUI

## Electrical Specifications:

- Mains power: 110-230VAC, Frequency 50-60Hz, Power Rating 250VA (MAX)

## Certification:

The equipment must be ISO 13485 and ICMED 13485 certified./ EUROPEAN CE

*Dr. Shikha Agarwal*  
MS, (Ophthalmology)  
Asso. Professor  
Dr. P.M.I.M.S., Lucknow

*Dr. Preema Thacker*  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.M.S., Lucknow

*Dr. S.P. Singh*  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*Prof. P.K. Das*  
Professor & Head  
Dept. of Anaesthesiology & C.  
Dr. RMLIMS, Lucknow

## HIGH END PHACO MACHINE

### I) Phaco Emulsification System:

- 1) Peristaltic dual segment pump with 7 roller Pump with Auto Venting.
- 2) Vent valve should be rotary for quick response
- 3) Rotary irrigation valve eliminates valve surge.
- 4) Optical irrigation sensor should be present for quick control.
- 5) Optical aspiration sensor should present for faster response.
- 6) Hand piece should be made of Titanium Material with 4 crystal with Hand piece Frequency of 32Khz and should be light weight.
- 7) System should have Advance Phaco Technology like Torsional Phaco technology.
- 8) Step by step tuning capability FMS and Handpiece.
- 9) All Modes like Linear, Panel, Pulse, Burst, and Continuous torsional Mode should be available.
- 10) Should work on Manual I/V Pole.
- 11) Disposable cassettes system to ensure sterility in each procedure.
- 12) Vacuum 650 mmHg.
- 13) Flow rate should be 60 cc/min
- 14) Pulse mode with variable frequency or time.
- 15) Tips 2.8mm, 2.2mm should be compatible and available.
- 16) Surgeon Memory should be 15-20.
- 17) All Accessories supplied should be from the same company.

### II) Anterior Vitrectomy:

- 1) Anterior Vitrectomy should be electric with Cut Rate 30 to 2000 Cuts/Min
- 3) Vitrectomy with cutters 20G, 23G cutters should be available.
- 4) Single cut should be possible.

### III) Other Requirements:

- 1) Foot Pedal should be wired and programmable as per surgeon need.
- 2) Should be compatible with Autosert hand piece.
- 3) Safety: advanced chamber stability with excellent surge control
- 4) Display Should be touch screen with voice confirmation for mode changing.
- 5) Machine should be Light Weight & portable
- 6) System must have 5 Year of Warranty Period.
- 7) DISPOSABLE items should be provided as per general term and condition
- 8) US FDA approved.

### Scope of supply:

- 1) Console - 1 Unit
- 2) Foot Pedal - 1 Unit
- 3) Phaco Handpiece - 1 Unit
- 4) Phaco Tips - 45D Kelman - 2 Units
- 5) Phaco Sleeve - 6 Units
- 6) Wrench - 1 Unit
- 7) Vitrectomy cutter 23G - 10 Unit
- 8) Diathermy Cable with pencil I Unit
- 9) Bimanual and co-axial irrigation cannula 1 pair each
- 10) FMS -20
- 11) CASSETE SET- 50

*Dr. Shikha Agarwal*  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Dr. Prolima Thacker*  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*Dr. S.P. Singh*  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*Dr. S.P. Singh*  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Frayagraj

*Dr. R.K. Das*  
Professor & Head  
Dept. of Anaesthesiology & CC  
Dr. RMLIMS, Lucknow

100

## ADVANCED PHACO MACHINE

General features	
Display	24 to 26 inches, touchscreen
Shelf life	Minimum 7 years
Cataract analysis and setting application Provided	yes
Item description	Advanced phaco emulsification machine
Cataract grade	Able to cut through grade 5 nucleus (cataract)
Vacuum level	Up to 650 plus mm Hg
Aspiration Flow Rates	Up to of 60 CC/Min.
Pump type	peristaltic
Reflux	Gravity fed
Venting	Fluid
Vacuum and aspiration flow rate control	Programmable linear control
Ultrasound	
Phaco Hand piece type	Torsional Hand piece and facility with high efficiency "Balanced Tip" which accounts for the Least heat generation at the wound site
Irrigation hand piece	Coaxial Irrigation hand piece
Size of incision	Cap ability to perform MICS with sub 2.2 mm sizes as well with the sue of Balance Tip And appropriated is posables.
Warning for the Irrigation Empty Bag	Yes
Ability to drive Torsional Hand piece with an oscillating frequency of minimum 32 Khz)	Yes
Able to phaco drive latest generation tip slike Kelman, Flared, min flared and aspiration bypass (ABS) tips in both 1.1 MM AND 0.9 MM configurations.	Yes
Phaco mode	Continuous
Pulse type	Short
Pulse rate	Upto 250/seconds
Duty cycles	adjustable
Hand piece compatibility with tips	30 degrees, 45 degrees, angled
Tips sleeves	Silicon sleeves
Infusion pole	Motorized and Mounted on trolley
Advance features	
Auto Sort—Motorized/Automated IOL Injection	Yes
Ergonomic Wireless Foot switch	Yes
Foot switch	With reflux function

*Dr. Shikha Agarwal*  
 MS. (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Dr. Prolima Thacker*  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

Department of Ophthalmology  
 K.G. Medical College  
 Lucknow

*Dr. S.P. Singh*  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*Prof. P.K. Das*  
 Professor & Head  
 Dept. of Anaesthesiology & CC  
 Dr. RMLIMS, Lucknow

Integration with Surgical Guidance System	Yes
Seamless integration of guidance steps into the procedural sequence	Yes
Phaco parameters over lay in surgeon's ocular	Yes
Patient/Eye confirmation in the OR: registration of eye with respect to pre-operative reference image	Yes
Eye tracking and guidance over lay for - Incision - Capsularhexis - IOL centration and/or orientation	Yes
fully fledged Graphic User Interface ( GUI ) with voice feedback when parameters are changed	Yes
<b>Media/video/recording</b>	
Facility to integrate "High-Definition Media Center" archiving system when connected to the system.	Yes
HD Recording on built-in hard drive or USB	Yes
Data embedded in each video frame	Yes
Wireless connection	Yes
Basic editing capabilities	Yes
Remote control	Yes for easy changing of function set during Surgery
<b>Vitrectomy</b>	
Cutter	23 gauge
Cut rate	Minimum 4000 CPM
Operation	pneumatic
<b>Maintenance</b>	
Maximum down time for break down calls	Within 36 hours
Spares and consumables	Suppliers will ensure delivery as per requirement
Accessories	Trolley with tray and stable castors
	UPS, minimum 2 kilo volt
	Disposable Phaco cassettes minimum 100 and/or Tubing set 2
	Test chambers minimum 2 and sleeves minimum 5
	Sterilization tray
	All standard accessories
Diathermy Handpiece	present
Certification	US-FDA

*Shikha*  
**Dr. Shikha Agarwal**  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Prof. Anoma Thacker*  
**Dr. Anoma Thacker**  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

Professor  
Department of Ophthalmology  
K.C. Medical University  
Lucknow

*S.P. Singh*  
**Dr. S.P. Singh**  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*Prof. R.K. Das*  
**Prof. R.K. Das**  
Professor & Head  
Dept. of Anaesthesiology & CCU  
Dr. RMLIMS, Lucknow

## BASIC PRISM BAR (PRISM SET)

Clinical Purpose	To measure the deviation in strabismus and to conduct polarized testing through prisms that are known to cause the least interference with polarization
Name of Tool	Prism BAR
The prisms should be of high quality	Yes
Prism box should include	Box comprising a Horizontal and a vertical prism bar Vertical prism bar, with 1/2/3/4/5/6/8/10/12/14/16/18/20/25D Horizontal prism bar with 1/2/4/6/8/10/12/14/16/18/20/25/30/35/40D/45D
Packaging	Packed in a formalin hard plastic as for added protection

*Shuchi*

*Dr. P. K. Sacker*  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*Dr. Shikha Agarwal*  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*(S)*  
Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*Dr. S.P. Singh*  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*Prof. R.K. Das*  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**ADVANCED PRISM BAR (PRISM SET)**

Clinical Purpose	To measure the deviation in strabismus and to conduct polarized testing through prisms that are known to cause the least interference with polarization
Name of Tool	Loose Prism Set
The prisms should be of high quality	Yes
Number of prisms in the set	22
Prism set should include(diopter)	½,1,2,3,4,5,6,7,8,9,10,12,14,16,18, 20,25,30,35,40,45, and 50
Set should have plus Red Lens	Yes
Measure of Each Piece	37 mm square
<b>PACKAGING</b>	
Packaging	Packed in a formalin hard plastic as for added protection
Certifications- USFDA/EUROPEAN CE	

*Shikha*  
**Dr. Shikha Agarwal**  
 MS. (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Dr. Prolima*  
**Dr. Prolima Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*Professor*  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

*S.P. Singh*  
**Dr. S.P. Singh**  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*P.K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CC.  
 Dr. RMLIMS, Lucknow

## BASIC RETINOSCOPE

GENERAL FEATURES	
Product	Streak Retinoscope
Type	Streak Retinoscope, handheld and portable
Purpose	To measure the refractive errors of the eye through the projection of a beam of light into the eye and the observation of the movement of the illuminated area on the retinal surface and of the refraction of the emergent rays
Utility	Newborns, Infants, Pediatrics up to 6 years, Adults

## PRODUCT TECHNICAL FEATURES

Compact design, light weight, easy to carry and use	Yes
Principle operating system of streak retinoscope	Projecting System and Observation system
One hand operation for streak focus and 360 degrees streak rotation for beam adjustment	Yes
Beam adjustments to Divergent, Parallel and Convergent	Yes
Large Semi-Reflector interference Mirror	Yes
Facility for interchanging plane mirror or concave mirror by sleeve movement	Yes
Filter type	Crossed linear polarizing filter
Working distance	50Cm+2.0D
External focusing sleeve for easy grip and to manipulate	Yes
100% dust proof sealed housing and multi-coated optics	Yes
Detachable brow rest for spectacle wearer	Yes
Handle	Battery handle
Fixation Card Magnet	Yes
Size (LxWxD) (cmxcmxcm)	23x2x2
Weight(gm)	150to175
ELECTRICAL FEATURES	
Power supply	Battery operated
Rechargeable battery	No
Battery type	Suitable any dry battery
Minimum battery back-up time(hrs.)	4
Light source	Halogen streak lamp
Capacity of streak lamp	2.5V,0.9AHalogen
PACKING MODE	
Packing kit contains Product manual, warranty card, Retinoscope, Accessories (Bulbs 5Nos, Bulb holder, Bulb cover), Dehumidifier, Cleaning brush, cleaning cloth, Battery and carrying box/hard case	Yes
Packing	Individually packed
ENVIRONMENTAL CONSIDERATIONS	
Capable of stored continuously in ambient storage conditions in ideal circumstances	0degCto50degC,15to90%RH
Capable of operating continuously in ambient conditions in ideal circumstances	10degCto40degC,15to90%RH

Dr. Shikha Agarwal  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

Dr. Prolima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S. Lucknow

Dr. S.P. Singh  
Professor  
Dept. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

Dr. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology &  
Dr. RMLIMS, Lucknow

CERTIFICATIONS & REPORTS	
Product certification	EU-CE
Submission of all the certifications and test reports to the buyer along with supplies on demand	Yes
<b>INSTALLATION &amp; TRAINING</b>	
Supplier to perform installation, safety and operation checks before handover	Yes
Training of users in operation and basic maintenance shall be provided	Yes

Set 3

*Shukla* *Sharma*  
 Dr. Prolima Thacker  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*Dr. Shikha Agarwal*  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*(Signature)*  
 Professor  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

*(Signature)*  
 Dr. S.P. Singh  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*(Signature)*  
 Dr. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## ADVANCED RETINOSCOPE

### Specifications:-

Working Distance	50 ± 20 cm
Handle	Battery Handle
Size ( L x W x D) cm Weight (g)	(18 - 20) x (1.5 - 2.5) x (1.5 - 2.5) cm 125 - 175 g
Rechargeable Battery	3.5 V USB rechargeable battery handle in retinoscope ALONG WITH USB CORD/ charging cable
Battery Type	Li - ion
Battery Backup	4 Hrs (Min.)
Operating System	Projecting and Observation System
360° Streak Rotation	Yes
Beam adjustment for Divergent, Convergent, Parallel	Yes
Semi Reflection Interference Mirror	Yes
External Focusing Sleeve	Yes
Dust Proof Sealed Optics	Yes
Capacity of Streak Lamp	2.5 V , 0.9A LED
Certification	US FDA / EUROPEAN CE

*Shikha*  
**Dr. Shikha Agarwal**  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Prolima*  
**Dr. Prolima Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*S*  
**Professor**  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

*S.P. Singh*  
**Dr. S.P. Singh**  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*R.K. Das*  
**Dr. R.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCU  
 Dr. RMLIMS, Lucknow

## SCHIOTZ TONOMETER

- High-quality agate bearing for long service life
  - Precision measurement on a scale of 0 to 20 sub-divisions
  - Perfect reading of the scale with red pointer
  - All vital parts are made of stainless steel
  - Including three weights (5.5 g, 7.5 g, 10 g) and a conversion table
  - Impact-resistant case
- 
- Dimensions Height: 130 mm, Width: 45 mm,
  - Weight: 24.4 g
  - Scale 0 to 20 graduation marks  
0 to -1 graduation mark  
One graduation mark corresponds to a stroke of 0.05 mm
  - Operating temperature 10 °C to 40 °C
  - Relative humidity 30% up to 70 % relative humidity, non-condensing
  - Storage temperature -20 °C to 70 °C
  - Storage relative humidity up to 85 % relative humidity, non-condensing Air pressure 700 hPa - 1060 hPa
  - Certification- EUROPEAN CE/ USFDA

*Shikha*  
**Dr. Shikha Agarwal**  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*P. Thacker*  
**Dr. Profima Thacker**  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*Q*  
Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*S.P. Singh*  
**Dr. S.P. Singh**  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*P.R. Das*  
**Prof. P.R. Das**  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**BASIC SLIT LAMP (WITH APPLANATION TONOMETER)**

Magnifications	3step(10x,16x,25x)
Field of view	26.5mm-8.7mm
Eye piece magnification	12.5xhigh-eye point eye pieces, +5D compensation of ametropia
IPD range of binocular tube	55-78mm
Width of slit image	0-12mm, continuously adjustable
Length of slit image	insteps:0.2/1/3/5/9/12
Angle of slit image	1-12mm, continuously adjustable
Decentration of slit image	+90°, continuous
Swivel range of slit projector	+/-4DegHorizontally, Fixatedat0° 180°, scale for angular difference, Clickstopat-10°-0°-+10°
Angle of incidence	Variableinsteps0°/5°/10°/15°/20°.
Filters	blue, green(red-free), and diffusing screen, Swing-in-type.
Free working distance, Exit prism/patient's eye Travel of instrument base	86-90mm
Vertical travel of chinrest	vertical:30mm, X-axis:100-110mm, Y-axis:90-100mm
Light Source	30-60mm 3 Amp, 10W, LED, continuously adjustable brightness, with tower top illumination.
Fixation lamp	Luminous fixation target (LED light)
Digital Camera	OPTIONAL
Facility to upgrade into digital slit lamp - yes	
Background illumination	Required
Table	Motorized table sufficient to Accommodate Slit lamp and imaging device
Accessories	Compatible with slit lamp,2
1. Applanation Tonometer biprisms	Required
2. UPS	Compatible(2KW), online backup time30 min

Certification- European CE

*Dr. Shikha Agarwal*  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Dr. Prolima Thacker*  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*(Signature)*  
Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*Dr. S.P. Singh*  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*Prof. P.K. Das*  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**TECHNICAL SPECIFICATION FOR SLIT LAMP (WITH APPLANATION TONOMETER)**

Magnifications	6X, 10x, 16x, 25x, 40X
Field of view	26.5mm-8.7mm
Eye piece magnification	12.5x high-eyepoint eyepieces, ±8D compensation of ametropia
Width of slit image	0-12mm, continuously adjustable
Length of slit image	insteps: 0.2/1/3/5/9/12
Angle of slit image	1-12mm, continuously adjustable
Decentration of slit image	±90°, continuous
Swivel range of slit projector	+/- 4Deg Horizontally, Fixated at 0°
Angle of incidence	180°, scale for angular difference, Clickstop at -10°-0°-+10°
Filters	Variable insteps 0°/5°/10°/15°/20°.
screen,	blue, green (red-free), and diffusing
Swing-in-type.	
Free working distance,	88 mm
Exit prism/patient's eye	
Travel of instrument base	vertical: 30mm, X-axis: 110mm, Y-axis: 90mm
Vertical travel of chinrest	59mm, 2.3in.
Light Source	15V, LED, continuously adjustable brightness, with two webtop illumination.
Digital Camera	OPTIONAL
Facility to upgrade into digital slit lamp - yes	
Table	Motorized table sufficient to Accommodate Slit lamp and imaging device

**USFDA CERTIFICATION**

**Accessories**

1. Applanation Tonometer (Zeiss Type) With 2 biprism
2. Motorized Table

*Dr. Shikha Agarwal*  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Dr. Prolinda Thacker*  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*Dr. S.P. Singh*  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*Prof. P.K. Das*  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

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**BASIC SNELLEN CHART (SNELLEN DRUM WITH OR WITHOUT REMOTE CONTROL)**

**PRODUCT TECHNICAL FEATURES**

Reverse test type, vision test drum with all tests	YES
Design suits all refraction rooms and easily mountable on refraction unit and wall	Yes
Compact and light weight	Yes
Chart functions operation type	Manually operated
Suitable mounting arrangements for wall mounting	Yes
Test chart type	Manually operated
Test functions of chart and their sequence	Six language test chart contains dots, English, any regional language, numbers or pictures, Hindi, 'c' or 'e' chart
Operation of E or C chart up or down movement	Manually operated/ remote operated
Operation of Vision test light for on and off	Manually operated by switch/ remote operated
Operation of Spot light on and off for retinoscopy	Manually operated by switch/ remote operated
Operation of Colour test light on and off	Manually operated by switch/ remote operated
Operation of Duo chrome test light on and off	Manually operated by switch/ remote operated
Include colour deficiency test	DESIRABLE
Chart available up to 6/4 vision (over correction)	DESIRABLE
<b>DIMENSIONS &amp; WEIGHT</b>	
Size of unit (HxWxL) (mmxmmxmm)	130x420x255
Weight of unit(Kg)	4
<b>ELECTRICAL REQUIREMENTS</b>	
Power Supply (Main)	230-/+10%, SinglePhaseAC,50Hz
Battery-cell for cordless remote control	9Vbattery
Unit should be supplied with high grade thermocol packing in cardboard box to avoid possible transit damage	Yes
Packing	Individually packed
<b>CERTIFICATIONS &amp; REPORTS</b>	
	ISO/EUROPEAN CE/BIS

*Shilpa Agarwal*  
 MS, (Ophthalmology)  
 Asso. Professor  
 r. R.M.L.I.M.S., Lucknow

*Dr. Prolima Thacker*  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*Professor*  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

*Dr. S.P. Singh*  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*Prof. P.K. Das*  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

# ADVANCED SNELLEN CHART (SNELLEN DRUM WITH REMOTE CONTROL)

Digital vision chart with remote	
Amsler Grid	Possible
Stereo Acuity Testing	Possible
Mask Type	Single
Power	20Watt
Test Type	Opto types Tests, Mirrored Opto types, Dot Pattern (Test), Color Pattern (Test), Duo-Chrome (Test), Snellen's Chart Pattern (Test) with all Indian & Foreign Languages
Visual Unit	20ft(500)-(10)
Binocular Vision Test	Maddox, Schober, Binocular Balance and Worth 4 Dot
Remote Control	RC5 Infrared Protocol
Isolation of letters	Possible for above 8 language
SMPSO/P(DC)	12Volt
Stepper Motor (DC)	12Volt
Remote Distance	Upto 6-8-meter working
Education Videos	Cataract & IOLS, Lasik, Anatomy of eye, Optometry, Contact Lenses, Child Fixation, Animation Slides
Duochrome Test	Suparmi position Possible on all charts
Frequency	50 Hertz
Low Vision Testing	Reverse Presentation
Random Chart Presentation	Possible
Projection	Direct
Background Illumination (cd/m <sup>2</sup> )	250
Display Type	LED
Display Voltage (DC)	12Volt
Astigmatic Fan	10-degree testing of axis possible
Grading	6.25 percent
Language Presentation	8 (Snellen, Landolt C, E, Number, Log Mar, Allen Pre-school, Regional Hindi, HOTV)
Working Distance	6ft-24f
Fixation Disparity Test	Possible
Contrast Sensitivity	6/24-6/6
Color Vision	24 plate Ishihara Type charts
Resolution	upto 1920*1080 pixels
Main Voltage	220Volt
CERTIFICATION	EUROPEAN CE/ISO

*Shikha Agarwal*  
**Dr. Shikha Agarwal**  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Prolima Thacker*  
**Dr. Prolima Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*S.P. Singh*  
**Professor**  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

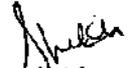
*S.P. Singh*  
**Dr. S.P. Singh**  
 Professor  
 Dept. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*P.K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**SPECIFICATIONS OF SPECULAR MICROSCOPE**

Endothelial image capture	Capture field	0.25 (W) x 0.55 (H) mm
Capture position	Central	1 point
	Paracentral	8 points (5° visual angle, 45° spacing)
	Peripheral	6 points (27° visual angle, 60° spacing)
Pachymetry Measurement range		300 to 1,000µm
Accuracy		± 10µm
Auto tracking / Auto Shot	X - Y - Z directions Auto shot	
Display		Tiltable 8.4-inch color LCD touch screen
Printer		Built-in thermal line printer External video printer (optional)
Interface		LAN, USB, Video output (BNC connector for video printer)
Power supply		AC 100 to 240 V 50 / 60 Hz
Power consumption		100 VA
Dimensions / Mass		291 (W) x 495 (D) x 457 (H)mm / 20 kg. 11.5(W) x 19.5(D) x 18.0 (H) " / 44 lbs.

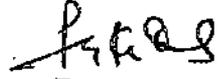
**CERTIFICATION EUROPEAN CE/ USFDA**

  
**Dr. Shikha Agarwal**  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

  
**Dr. Profima Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

  
 Professor  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

  
**Dr. S.P. Singh**  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## SYNAPTOPHORE

Optional Tubes Movement	Horizontal - Adduction +50°, -40° Vertical - Hyperphoria 30°, Hyperphoria 30° Torsional - Incyclophoria 20°, Exyclophoria 20°
Auto flashing	Auto flashing of slide illumination either simultaneously, or alternatively in rapid and variable modes.
Haidinger Brush	12V illumination lamp and easy motor speed control in Both directions.
Slide Illumination	Rheostat controlled 6V halogen lamp for each side. High intensity 12V for after image illumination.
Chinrest Height	85 to 105mm (From Eye Piece tube)
Pupil Adjusting Distance	45 to 75mm
Lamp Voltage	Target Illumination : 6.2V, 0.3A Bulbs After Image : 12V, 2A Bulbs
Transformer	Pri- 0-230V, Sec-0-12V, 14V; 3A
Electrical Characteristics	Main Voltage : 230V AC Supply Power : 25W Frequency : 50Hz
Physical characteristics	430mm (H) X 550mm (W) X 265 mm (B) Net Weight: 10.5Kgs. Gross Weight: 17.5Kgs
Standard Accessories	Slide Box, Dust Cover, Blue Filter, 6V Bulb, 12V Bulb, 2A Fuse
Optional Accessories	Motorized Stand

SLIDE BOX	1 No
DUST COVER	1 No
BLUE FILTER SMALL	2 No
6 VOLT BULB	2 No
12 VOLT BULB	2 No
2Amps FUSE	2 No

*Shilpa Agarwal*  
**Dr. Shilpa Agarwal**  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Prolima Thacker*  
**Dr. Prolima Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

  
 Department of Ophthalmology  
 K.C. Medical University  
 Lucknow

*S.R. Singh*  
**Dr. S.R. Singh**  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*P.K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

# DIGITAL TONOMETER (TONOPEN)

## PHYSICAL DIMENSIONS

Size: 16 cm x 2 cm x 4.4 cm (6 1/4" x 3/4" x 1 3/4")

Weight: 71 g (2.4 oz)

## ENVIRONMENTAL REQUIREMENTS

### Operational Environment

Ambient Temperature range: 15° to 35°C (59° to 95°F)

Relative Humidity range: 30 to 75%

Atmospheric Pressure range: 80 kPa to 106 kPa (23.6 to 31.3 in.Hg)

### Transport and Storage Environment

Ambient Temperature range: -10° to 60°C (14° to 140°F)

Relative Humidity range: 50 to 95% (non-condensing)

Atmospheric Pressure range: 50 kPa to 106 kPa (14.8 to 31.3 in.Hg)

## ELECTRICAL

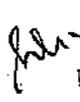
- Input Voltage: 2 x 3 V Lithium Manganese Dioxide batteries (TONO-PEN AVIA POWERCEL battery pack)

## RANGE OF IOP MEASUREMENTS - 5 to 55 mmHg

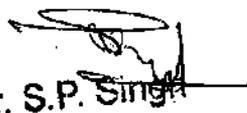
OCU-FILM + TIP COVER Contains natural rubber latex

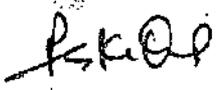
SOFTWARE REVISION The software revision can be obtained by contacting Reichert Technologies. The serial number identifies the manufacture date and will provide access to the software version

  
Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

  
Dr. Profima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

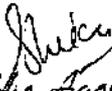
  
Dr. Shikha Agarwal  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

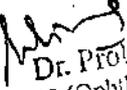
  
Dr. S.P. Singh  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Trial frame

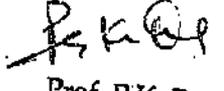
1. Should be of high-quality metal
2. Marking should be clear
3. SCREW –to adjust IPD- yes
4. One adult and one pediatric required
5. WEIGHT: 77g (2.7 Ounces)
6. PUPIL DISTANCE (PD) ADJUSTMENT RANGE: 48 – 80 mm (24 – 40mm Per Side)
7. HOLDS UP TO 8-10 TRIAL LENSES
8. PER SIDE: Four (4) lens slots – Fits 3 in Front & 1 in Back
9. •AXIS MARKERS: Displayed in (+/-) 5° increments
10. ◦ LEFT AXIS: 120, 0, and 135°
11. RIGHT AXIS: 45, 180, and 60°
12. NOSE PAD ADJUSTMENT: Range 0 – 14mm
13. TEMPLE EXTENSION: 110 – 135 mm
14. LENS ROTATION: 360°

  
Dr. Shikha Agarwal  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Prolima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

  
Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

  
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Dept. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Product	Trial lens set for adult and pediatric use
Type	Portable
Purpose	For testing vision
Sphere lens in pairs	+/-160count
Sphere lens diopters configuration	0.2D to 20.00D
Cylinder lens in pairs	+/-80count
Cylinder lens diopters configuration	0.25 to 6.00D
Prism lenses in pairs (12Count)	0.5
Prism lenses in singles(12Count)	1.00, to 10.00
Auxiliary Lenses (16 count) (+/- Jackson cross Cylinder)	0.25, 0.5
Auxiliary Lenses single	Red Lens, Green Lens, Occluder, 1.00mm Slit, Polariscopes, Frosted
Auxiliary Lenses pairs	Maddox, Plano, Cross, Pinhole
Diameter of Lenses to fit into the trial frame (mm)	38
Trial frame	One adult and 1 pediatric, each
Near vision drum	yes
Packing kit contains Product user manual, Lenses, Dehumidifier, Cleaning brush, cleaning cloth in a strong carry suit case or hard box	Yes
Certification	USFDA/EUROPEANCE/ISO/BIS

*Shikha*  
**Dr. Shikha Agarwal**  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Prilima*  
**Dr. Prilima Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*(S)*  
**Professor**  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

*S.P. Singh*  
**Dr. S.P. Singh**  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*P.K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**BASIC SLIT LAMP (PHOTO- WITH APPLANATION TONOMETER)**

Magnifications	3step(10x,16x,25x)
Field of view	26.5mm-8.7mm
Eye piece magnification	12.5xhigh-eye point eye pieces, +5D compensation of ametropia
IPD range of binocular tube	55-78mm
Width of slit image	0-12mm, continuously adjustable
Length of slit image	insteps:0.2/1/3/5/9/12
Angle of slit image	1-12mm, continuously adjustable
Decentration of slit image	+90°, continuous
Swivel range of slit projector	+/-4DegHorizontally, Fixatedat0° 180°, scale for angular difference, Clickstopat-10°-0°-+10°
Angle of incidence	Variableinsteps0°/5°/10°/15°/20°.
Filters	blue, green(red-free), and diffusing screen, Swing-in-type.
Free working distance,	86-90mm
Exit prism/patient's eye	
Travel of instrument base	vertical:30mm, X-axis:100-110mm, Y-axis:90-100mm
Vertical travel of chinrest	30-60mm
Light Source	3 Amp, 10W, LED, continuously adjustable brightness, with tower top illumination.
Fixation lamp	Luminous fixation target (LED light)
Digital Camera	Integrated18MPHD camera attachment, OEM. Image processing software should be from same manufacturer Image management software with storage facility of still images & movie recordings.
Background illumination	Suitable High-End PC to be provided to install the software. Required
Table	Motorized table sufficient to Accomodate Slit lamp and imaging device
Accessories	Compatible with slit lamp,2
3. Applanation Tonometer biprisms	Required
4. UPS	Compatible(2KW), online backup time30 min

Certification- European CE

Dr. *Shikha Agarwal*  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

Dr. Prolima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

Dr. S.P. Singh  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

DESCRIPTION FOR SLIT LAMP(photo- WITH  
APPLANATION TONOMETER)

Magnifications	6X,10x,16x,25x40X
Field of view	26.5mm-8.7mm
Eye piece magnification	12.5xhigh-eyepointeyepieces, ±8D compensation of ametropia
Width of slit image	0-12mm, continuously adjustable
Length of slit image	insteps:0.2/1/3/5/9/12
Angle of slit image	1-12mm, continuously adjustable
Decentration of slit image	±90°, continuous
Swivel range of slit projector	+/- 4Deg Horizontally, Fixated at 0° 180°, scale for angular difference, Clickstopat-10°-0°-+10°
Angle of incidence	Variableinsteps0°/5°/10°/15°/20°.
Filters	blue, green(red-free), and diffusing
screen,	
Swing-in-type.	
Free working distance,	88 mm
Exit prism/patient's eye	
Travel of instrument base	vertical:30mm, X-axis:110mm, Y-axis: 90mm
Vertical travel of chinrest	59mm,2.3in.
Light Source	15V, LED, continuously adjustable brightness, with two webtop illumination.
Digital Camera	Integrated 18MPHDcameraattachment with USB foot control & workstation.
Image processing software should be from same manufacturer.	

USFDA CERTIFICATION

Accessories

3. Applanation Tonometer (Zeiss Type) With 2 biprism
4. Motorized Table

*Dr. Shikha Agarwal*  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Dr. Prolima Thacker*  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*Professor*  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*Dr. S.P. Singh*  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*Prof. P.K. Das*  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

# BASIC YAG LASER

## PERFORMANCE PARAMETER

Purpose	It is used to treat posterior capsular opacification (PCO) after cataract surgery and to create a peripheral iridotomy in patients with narrow angles or angle-closure glaucoma
Laser beam profile should be highly precise	Yes
Type of structure mode	Super Gaussian
Type of pulse	Triple Pulse
Number of Step of energy level	22
Type of aiming/focusing beam laser	Laser diode
Availability of four point aiming beam	Yes
Source of power supply	Single Phase(230V,50Hz)
Availability of slit lamp with 5-step magnification	Yes, from same manufacturer
External Control Panel	Yes
Source of Illumination	Halogen lamp
Power of lamp in watt	30
Source of Illumination should be adjustable	Yes
Type of tube used	Convergent tube
Machine should have Isolation transformer for safe handling	Yes
Motorized table provided	Yes, sourced from any manufacturer
Warranty in years	5
Comprehensive Maintenance Contract (CMC) which includes preventive maintenance including testing & calibration as per technical/ service /operational manual, about and spares, after satisfactory completion of Warranty period	5
Certificate to be available from OEM/principal regarding approved centers for servicing	Yes
Operating temperature range and humidity	0 to 50 degree centigrade and humidity 15-90%
Product should be made up of high-quality material, pretreated with materials providing good finish, scratch resistant, bacteriostatic coating	Yes
2 sets of Product in striction manual, Service manual and troubleshooting guide shall be supplied in original	Yes
Demonstration of equipment and training to be provided after completing supplies before Acceptance	Yes
<b>Dimensional Parameter</b>	
Laser wave length in nm	1064
Optical breakdown in air in Mj	2.5
Pulse duration time in ns	3
Maximum laser energy in mJ	37
Minimum energy level range in mJ	0.3-10
Maximum pulse repetition frequency in Hz	2/3
Focus diameter in air in	10
Cone angle or Angle of exit aperture in degree	16

**Shikha Agarwal**  
 MS, (Ophthalmology)  
 Asso. Professor  
 M.L.I.M.S., Lucknow

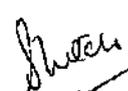
**Dr. Prolima Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

**Professor**  
 Department of Ophthalmology  
 K.G. Medical College  
 Lucknow

**Dr. S.P. Singh**  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

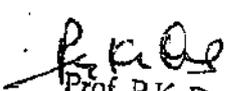
Power of aiming beam in Mw	625 to 685
Range of aiming beam focus off set for posterior & anterior focus shift in $\mu\text{m}$	5 to 150 $\pm 150$
Range of continuous slit width adjustment in mm	1 to 14
Slit length in mm	1, 3, 5, 9, 14
Maximum magnification for slit lamp	32x
Eye pieces magnification	12.5x
Focus length of tube of in mm	140
Range of Adjustable IPD in mm	55 to 75
Reports & Certifications	European CE/ISO

  
**Dr. Shikha Agarwal**  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

  
**Dr. Pratik Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

  
**Professor**  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

  
**Dr. S.P. Singh**  
 Professor  
 Dept. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**ADVANCED YAG LASER**

Sl No	Specification
1	Laser wavelength 1064nm.
2	Laser source: Nd: YAG laser: flash lamp-pumped, Q-switched
3	Beam profile: super-Gaussian for highly precise beam profile.
4	Optical breakdown 2- 2.7 mj or less in air.
5	Pulse duration < 4ns
6	Pulse mode: Single Pulse - 9mJ to 13 mJ ; Double pulse -18mJ to 28 mJ; Triple pulse- 29mJ to 45mJ.
8	Energy attenuation levels:20- 25 steps
9	Pulse repetition frequency Max.2 Hz.
10	Focus diameter 8- 10 micron in air.
11	Cone angle/Angle of exit aperture 16 Deg.
12	Switchable aiming beam: 4 point and 2 point Aiming beam, with 620 - 670nm wavelength. With option to change the brightness.
13	Focus offset between aiming beam and therapy beam should be upto +/- 300 um posterior & anterior focus shift in a step of 75um from 150um to 300um with fixed optics for highest precision.
14	Laser system should have option to change parameters from slitlamp, and also the option to display the pameters in eye piece.
15	Slit Lamp with 3 set magnification changer with 10x eyepieces and straight tube f=140mm with PD adjustable 50-78mm.
16	Illumination: LED with halogen effect. 5.6V,2W with continuously adjustable brightness
17	Slit width 0-14mm continuous, Length 1/3/5/9/14mm
18	Laser system should have the option of floater treatment.
19	System should be capable of generating treatment report with or without additional software form the manufacturer.
20	Laser slit lamp should have a option for integrated camera for imaging the procedure.
21	Cooling system should be Thermoelectric
22	US FDA APPROVED

*Dr. Shikha Agarwal*  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Dr. Prolima Thacker*  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

Professor  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

*Dr. S.P. Singh*  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*Prof. P.K. Das*  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## OPTICAL BIOMETER

1. SWEPT Source Biometry (Non-contact) showing full length OCT image showing anatomical details of the Eye on a longitudinal cut through the entire eye.		
2. Should be able to detect usual eye geometries, such as a tilt or decentration of crystalline lens.		
3. Facility of fixation check. All measurements calipers are shown on the full-length OCT image to verify the structure of the eye has been measured. Thus, potential source of errors are eliminated		
4. Should have telecentric keratometry for distance independent keratometry		
5. Posterior keratometry measurements, TotalK		
Measurement range	Axial length	14-36mm
	Corneal radii	5-10mm
	Anterior chamber depth	0.7-8mm
	Lens thickness	1-10mm (phakic eye) 0.13-2.5mm (pseudophakic eye)
	Central corneal thickness	0.2-1.2mm
	White-to-white	8-16mm
SD of repeatability	Axial length	5 $\mu$ m
	Corneal radii	0.09D
	Cylinder	>0.75D, axis 3.8°
	Anterior chamber depth	7 $\mu$ m
	Lens thickness	6 $\mu$ m
	Central corneal thickness	2.5 $\mu$ m
	White-to-white	111 $\mu$ m
IOL calculation formulas	Barrett Suite: Barrett Universal II & Barrett TK Universal II*, Barrett toric & Barrett TK toric*, Barrett True K & Barrett True K with TK.	
	Haigis Suite: Haigis, Haigis-L, Haigis-T	
	Hoffer®Q	
	Holladay 1 and 2	
	SRK®/T	
New Haigis T formula on board for Toric IOL power calculation		
Interfaces	Data interface for electronic medical record (EMR) / patient management systems (PMS), Holladay IOL The equipment should have integrated hardware & software (CPU) within the single unit. Consultant software and Phaco Optics® Data export to USB storage media Ethernet port for network connection and network printer	
Line voltage	100-240V $\pm$ 10%(self-sensing)	
Line frequency	50-60Hz	
Power consumption	max. 150VA	
Laser class	I	
autotracking	Yes, present	
CERTIFICATION	USFDA	

Dr. Shikha Agarwal  
MS (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

Dr. Prolima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAI Department of Ophthalmology  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

Professor  
Department of Ophthalmology  
R.G. Medical University  
Lucknow

Dr. S.P. Singh  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

Prof. R.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## BASIC A-B scan (with UBM Probe)

Advanced Combined System B-scan with UBM having the following technical specification and configuration.

### B-scan Functions:

- Gain: gain Range -128dB to +128dB. TGC Near, Mid, Far (user adjustable slider).
- B-scan probe : 10-100 MHZ (optional:10MHZ,20MHZ)
- Scan angle : Angle Range 20 to 60 degree
- Axial resolutions: range from 0.01 to 0.03mm
- Lateral resolution: Range from 0.1mm to 0.3mm
- Vector density and sampling: 256vectors×2048points
- 256 Gray scale
- Scan Depth : Scan modes to optimize image quality in area of interest including Retina, Vitreous, Orbit
- View zone : view zone range 30 to 60mm
- A/B scans capability : A-scan vector available as over lay on B-mode images.

### UBM Functions:

- Gain: gain Range -128dB to +128dB. TGC Near, Mid, Far (user adjustable slider).
- UBM probe : 35 MHZ OR 50 MHZ
- Scan angle : Angle Range 20 to 35 degree
- Axial resolutions: 40 Microns(0.04mm)
- Lateral resolution: 50 microns(0.05mm)
- View zone : view zone range 14 to 18 mm

### Measurements tools:

- Caliper tool: Measure any distance like Axial Lenth, Sulcus to sulcus, iris thickness, ACD, etc..
- Angle: To measure the Glaucoma Angle
- Area : measure any foreign body or cyst
- Text : To create text on the Image.
- Probe orientation: Mention the orientation on each image for easy diagnosis for glaucoma patient.
- Flood fill color: To differentiate the particular segment.

### User Interface & Programmability:

- 24" HD Display
- Real time video capture 600 frames per cine up to 10 videos per eye
- Compatible with any EMR software
- Report export format: JPEG, PDF, HTML, MHT, RTF, XLS, XLSX, CSV,
- Image export format: PNG, IPEG, BMP, GIF, TIFF.

### Electrical Specifications:

- Mains power: 110-230V AC, Frequency 50-60Hz, Power Rating 350 VA (MAX)

### Certification:

The equipment must be ISO 13485, ICMED 13485 certified & CE certified.

  
Dr. Shikha Agarwal  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Prolima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

  
Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

  
Dr. S.P. Singh  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

  
Prof. P.R. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

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**ADVANCED A-B scan (with UBM Probe)**

Advanced Combined System B-scan with UBM having the following technical specification and configuration.

**B-scan Functions:**

- Gain: gain Range -128dB to +128dB. TGC Near, Mid, Far (user adjustable slider).
- B-scan probe : 12 MHZ (optional:10MHZ,20MHZ)
- Scan angle : Angle Range 20 to 60 degree
- Axial resolutions: range from 0.1 to 0.3mm
- Lateral resolution: Range from 0.2mm to 0.5mm
- Vector density and sampling: 256vectors×2048points
- 256 Gray scale
- Scan Depth : Scan modes to optimize image quality in area of interest including Retina, Vitreous, Orbit
- View zone : view zone range 30 to 60mm
- A/B scans capability : A-scan vector available as over lay on B-mode images.

**UBM Functions:**

- Gain: gain Range -128dB to +128dB. TGC Near, Mid, Far (user adjustable slider).
- UBM probe : 35 MHZ (Optional : 50 MHZ)
- Scan angle : Angle Range 20 to 35 degree
- Axial resolutions: 40 Microns(0.04mm)
- Lateral resolution: 50 microns(0.05mm)
- View zone : view zone range 14 to 18 mm

**Measurements tools:**

- Caliper tool: Measure any distance like Axial Lenth, Sulcus to sulcus, iris thickness.
- ACD, etc..
- Angle: To measure the Glaucoma Angle
- Area : measure any foreign body or cyst
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- Flood fill color: To differentiate the particular segment.

**User Interface & Programmability:**

- 24" HD Display
- Real time video capture 600 frames per cine up to 10 videos per eye
- Compatible with any EMR software
- Report export format: JPEG, PDF, HTML, MHT, RTF, XLS, XLSX, CSV,
- Image export format: PNG, IPEG, BMP, GIF, TIFF.

The equipment must be US FDA/ EUROPEAN CE CERTIFIED

*Dr. Shikha Agarwal*  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Dr. Prolima Thacker*  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*Professor*  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*Dr. S.P. Singh*  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*Prof. P.K. Das*  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**Laser Console/Laser Photocoagulator**

Treatment Laser Beam: Diode pumped frequency doubled, true CW & solid state. 3 Watts  
Capacity laser diode with 10,000 working hours lifetime. Power variable from 10 to 1500 mW.

Pulse duration/pulse interval from 10 ms to 10000 ms. Class IV type laser

Aiming Laser Beam: 635 nm, Semiconductor diode laser, 0 to 1 mW (variable)

Cooling Facility: Thermo electric cooling (peltier) and air cooled

Operation Mode: Repeat pulse, single pulse & continuous mode (Amogh Smart)

User Interface: LCD touch screen (8 inches Screen)

Electrical Requirements: 100/240 VAC, 50/60 Hz, 2A, 100 Watts power consumption  
Dimensions & Weight: 290mm(H) x 180mm(W) x 365mm(D) & 8 Kgs

**Integrated Laser Slit Lamp (ILS) – Standard Delivery System**

Laser Spot Size: 50 to 1000 microns in 7 Segment LED display. Laser Beam Delivery Coaxial delivery with slit illumination

Laser Slit Lamp Head Assembly: Convergent binocular assembly. 12.5 x Wider eye piece magnifications. 5 Step magnifications (6x, 10x, 16x, 25x, 40x). Standard slits of 0°, 45° & 135°. IN BUILT true color protection filter

Laser Slit Lamp Illumination: 12V, 30W Halogen lamp with brightness variable illumination.

Slit Length Adjustment in step of 1, 3, 5, 8, 10, 14 mm. Slit Width Adjustment continuously from 0-14 mm. Yellow, green (red free) & cobalt blue filters

Micro Manipulator: Electronic micro manipulator in the joystick with 360 degree movement

Electrical Requirements: 100/240 VAC, 50/60 Hz, 2.5A, 65 Watts Power consumption

Dimensions & Weight: 530(L) x 380(W) x 600(H) mm & 10 Kgs

Movement Ranges: Longitudinal (In/Out) - 99 mm. Lateral (Left/Right) - 118 mm.  
Vertical (Up/Down) - 30 mm. Chin rest range - 90 mm

**Laser Indirect Ophthalmoscope (LIO) – Optional Delivery System**

LIO Illumination: LED 1 Watt, 3.3 VDC, 700 mAh. Illumination Field Clear circular. Intensity

Control Continuously variable. Yellow, white & cobalt blue filters

Laser Spot Size: Standard spot size of 200  $\mu$  on the retina in 350 mm standard working distance.

Variable spot size between 181  $\mu$  (300 mm working distance) to 550  $\mu$  (700 mm working distance)

*Shikha Agarwal*  
MS, (Ophthalmology)  
Asso. Professor  
R.M.L.I.M.S., Lucknow

*Dr. Profima Thacker*  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*Dr. S.P. Singh*  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*Pankaj Das*  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

distance) on the retina

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LIO Binocular: Stereoscopic optical system. Pupillary Distance between 52 to 74 mm. Aperture

Size 4.0 mm, 3.0 mm & 1.2 mm. Image Size 80.0 mm, 60.0 mm & 25.0 mm. Inbuilt true colour protection filter

Electrical Requirements: 100/240 VAC, 50/60 Hz, 2A, 2 Watts power consumption

Dimensions & Weight: Standard packing case of 230 x 520 x 450 mm & 700 grams (approx.)

Endo Probes - Optional Delivery System

Ergonomic design with straight & curved/angled probes available in 20G, 23G, 25G, 27G series.

Pre-sterilized & disposable probes and also compatible for other selected laser photocoagulators.

Easy entry through small gauge cannulas and reliable spot placement even at far periphery

Standard Accessories

Foot Switch, Safety Goggle, Dedicated Motorised Table, Fiber Optic Cable (ILS & LIO), Laser

Treatment Lens - 2 No.'s, Elbow Rest (1 Set), Dust Covers, LCD Arm, Console Mount, Eye piece Lens & Carry Case

#### Accessories

20 D Lens (USFDA APPROVED), Extended Length Fiber Optic Cable (LIO) & Microscope Protection Filter

#### Features

- Light weight and portable.
- Metal shielded laser delivery fiber optic cable
- Integrated Voice confirmation technology
- Parameter presets for different treatment procedures
- LED illuminated foot switch, ON/OFF switch & fiber connecting port
- Instant and easy access of the entire system
- Advanced optics in integrated laser slit lamp and the electronic micromanipulator in it allows user to move the illumination altogether with coaxial aiming beam ensures the ultimate in controlled safety
- Dedicated wheel chair accessible motorised table
- Ergonomic design provides comfort to user
- Compact and convenient foot switch
- The precise guidance of the aiming beam and the therapy beam guarantees optimum illumination on the site of treatment at all times whether it is in the far periphery or in the vicinity of the macula
- Electronic micro manipulator ON/OFF switch
- Ideal for patients who are best examined and can be treated in supine position, including neonates, small children and disabled patients
- Variable focus option is an added advantage
- Vertical movement adjustment for illumination beam
- Coaxial system of laser aiming beam along with white light illumination gives comfortable treatment
- LIO can be made compatible for other selected lasers
- True focus optical system with small pupil adjustment
- LCD touch screen with mounting option on table and also on the console

*Dr. Shikha Agarwal*  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Dr. Prolima Thacker*  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*Dr. S.P. Singh*  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*Dr. P.K. Das*  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

- Add on specifications available for amogh smart: (at an additional cost)
- Insight view display with on/off option
- 3D mouse joystick
- Green laser beam power output higher or lower than existing range

- Green laser spot size higher or lower than existing range
- Green laser duration higher or lower than existing range
- Dual port photocoagulator
- Power control in the footswitch & Ready-standby control in the footswitch (wireless foot pedal)
- Wireless LIO
- Dynamic integrated laser slit lamp (which includes entire pc, beam splitter, c mount & ccd camera and imaging software)
- Beam splitter, c mount, ccd camera for video viewing
- Assistant scope/co-observation tube for assistant view
- Painting mode
- Micropulse option
- Tonometer AT 030
- Breadth shield

**CERTIFICATION: EU CE**

*Shikha*  
**Dr. Shikha Agarwal**  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Prolima*  
**Dr. Prolima Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*B*  
**Professor**  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow  
*S.P. Singh*  
**Dr. S.P. Singh**  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*P.K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

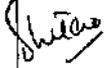
## ADVANCED GREEN LASER

- Frequency Doubled Solid State, diode-pumped with diode on demand Technology, Continuous Wave
- Wavelength 532nm, Max. Power 1.5W at cornea or more
- Laser Console with Single or Dual Fiber port.
- Aiming beam 620-650 nm laser diode, Adjustable Brightness, Max. power 1mW
- Auto pulse adjustable from 10-6000 ms pulse interval
- Pulse duration 10-2,500ms, CW (Max 180s).
- Electrical connection: 100-240V, 50/60Hz
- All laser parameters like power, pulse duration, pulse interval etc. should be displayed in eyepieces. If required can be switched off also.
- Should have Touch Control Centre Switch to change and adjust parameter while viewing through eyepieces during laser delivery through: This will save chair time of patient.
- Should have compact display with Easy GUI to plan treatment protocols efficiently and effectively.
- Thermoelectric cooling (Must)
- To avoid overlapping of laser spot should have unique Square Aiming beam & Laser Energy also delivered in square spot.
- Laser should be with integrated with Original Zeiss/Haag-street Slit Lamp for Laser delivery, Laser delivery should be through Slit lamp prism.
- Laser spot diameter 50-1,000um (Without Contact Lens Used), Parfocal, continuously adjustable, larger spot sizes depending on contact lens used.
- Slit Lamp should have 5-Step Magnification Changer and should give 5/8/12/20/32X magnification
- Must have Physician safety filter in Slit Lamp.
- Slit Height 1/3/5/9/14mm, slit Width 0-14mm continuous.
- Slit Image Rotation 0 degree / +45 degree / 90 degree.
- Must have Servo electric micro manipulator for precise shift of laser beam along with Aiming, beam & Slit beam without moving slit Lam
- Suitable laser contact lenses (i.e. Goldman 3 mirrors, Minster PRP 125 deg.)

### Accessories:

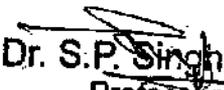
- LIO with LED illumination System with chargeable battery, 20D Laser Lens.
- Physician Safety filter.
- Endo Probes 25G.

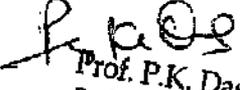
### CERTIFICATION: US FDA

  
**Dr. Shikha Agarwal**  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

  
**Dr. Prolima Thacker**  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

  
Professor  
Department of Ophthalmology  
K.C. Medical University  
Lucknow

  
**Dr. S.P. Singh**  
Professor  
Dept. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

  
**Prof. P.K. Das**  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

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# BASIC OCT MACHINE (WITH ANGIOGRAPHY)

Scanning and fundus imaging method : Spectral domain OCT with Fundus Camera & Fundus Auto Fluorescence (optional)

OCT Scanning Technology

Spectral domain OCT

OCT resolution

Digital Z: 4 mm, XY: 3 micrometer

Scanning range

Z: 2.1 mm

OCT Angiography

XY: 3 to 9 mm

Available (Optional)

OCT light source

SLD 880 nm

Scanning speed

70,000 A-scans/sec.

Acquisition time of 3D image

1.6 s

Internal fixation lamp/Wavelength

Cross shape (normal or large) / 635 nm

External fixation lamp

Red / Green

Auto alignment

Z direction

Auto Tracking

+/- 16mm up & down

Minimum pupil diameter

+/- 5mm right & left

Focus adjustment range

+/- 5 back & forth

Working distance

2.5mm

Scanning pattern

-15 to +10 D (VD=12mm)

45.7 mm

Macula line,

Macula across

Macula map

Macula multi

Macula Radial

Disc circle

Disc map

Disc Radial

Retina Map

Segmentation of 6 retinal layers

Macular thickness map

RNFL thickness map

Optic nerve analysis

Follow-up examination of pathological progress

Software analysis

OCT phase fundus

40 x 30 Degree

Fundus Surface Imaging

Principle

Angle of view

Fundus Camera

Type

Angle of view

Minimum pupil diameter

Light source

Flash intensity

Non-mydiratic fundus camera, color, FAF

45 Degree

Dia 4mm (3.3mm for small pupil capture)

Xenon flash lamp 300.Ws

17 leves from F1(F4.0 + 0.8 EV) to F17 (F16+0.8 EV)

0.25 EV increments.

Built-in 12-megapixel CCD camera

Camera

Anterior segment adapter

Scan patterns

Cornea Cross, Cornea Radial, Cornea Raster, ACA line

*Shilpa Agarwal*  
MS, (Ophthalmology)  
Asso. Professor  
M.L.I.M.S., Lucknow

Dr. Prolima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.I.M.S., Lucknow

Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow  
*Dr. S.P. Singh*  
Professor  
Dept. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*P.K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCU  
Dr. RMLIMS, Lucknow

Software analysis

PC Networking

CERTIFICATION- USFDA/EUROPEAN CE

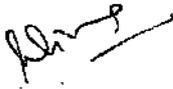
Corneal thickness measurement

Corneal thickness map, angle measurement  
Available

438



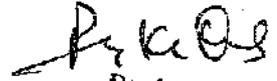
**Dr. Shikha Agarwal**  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow



**Dr. Prolima Thacker**  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow



**Dr. S.P. Singh**  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj



**Prof. P.K. Das**  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow



**Professor**  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

**ADVANCED OCT MACHINE (WITH ANGIOGRAPHY)**

Methodology	Spectral Domain OCT
OCT Scanning	Axial resolution: 5um (in tissue), 1.95um (digital) Transverse resolution: 15 um (in tissue)  Scan speed: 100,000A-Scansper second A-scan depth: 2.0mm-2.9mm(in tissue)  Optical Source: luminescent diode (SLD), 840 nm
Fundus Imaging	Line Scanning Laser Ophthalmoscope (LSO) Transverse Resolution: 15 um (in tissue) Optical source: 750 super luminescent diode (SLD). Field of view: 36 degree x 30 degree
Posterior Segment Scans	OCT :Cube scan (Macula and Optic Disc) HD Raster (1,5,21- line, cross and radial); Raster scan length 3-12 mm; Image averaging upto 100x OCTA: High definition Angio scans (8x8 and 6x6) for greater micro vascular detail without limiting the field of view. 3x3, 6x6, 8x8, 12x12 mm(Macula); 4.5x4.5mm (Optic Nerve Head); 14x10mm (Montage), 14x14 mm (Montage)
Anterior Segment Scans	Cube, HD Cornea, Pachymetry, HD Angle, Wide Angle-to-Angle, Anterior Chamber, 5-Line Raster
Applications	<b>GLAUCOMA:</b> Ganglion Cell/IPL Thickness with Reference Database (Diversified and Asian), RNFL Thickness with Reference Database (Diversified and Asian), ONH Parameters with Reference Database (Diversified and Asian), Average cup-to-disc ratio, Average, Superior and Inferior RNFL Thickness Should provide both trend and event based analysis to detect statistically significant change and should be able to quantify the rate of change for RNFL, ONH and GCL Parameters
Advanced Tracking	Present
Refractory Error Adjustment	-20 Diopter To +20 Diopter

*Shikha*  
**Dr. Shikha Agarwal**  
 MS. (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Prolima*  
**Dr. Prolima Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*P*  
**Professor**  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

*S.P.*  
**Dr. S.P. Singh**  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*P.K.D*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

	<p><b>RETINA:</b> Thickness Analysis with Reference Database (Diversified and Asian),          Macular Change Analysis, Advanced RPE Analysis, 3D Visualization, En Face Analysis</p> <p><b>ANTERIOR SEGMENT</b>          9 mm Epithelial Thickness and Pachymetry Mapping, HD Cornea with Cornea Caliper Tool, Full Anterior Chamber Imaging for phakic IOL sizing and safety distance measurements, Angle imaging and measurement tools for Glaucoma (AOD, TISA, SSA)</p> <p><b>Angio OCTANALYSIS</b></p> <ul style="list-style-type: none"> <li>- Macular: Fovea Vascular Zone, Perfusion Density (ETDRS grid), Vessel Density (ETDRS grid)</li> <li>- Optic Nerve Head: Capillary Perfusion Density, Capillary Flux Index</li> <li>- 2-visit comparison</li> </ul>
<p>Software/normative data</p>	<p>USFDA approved normative data base for RNFL, ONH &amp; MACULA.          Macula thickness analysis and Macula change analysis. RNFL Thickness analysis and Progression analysis for RNFL, ONH and GCL/IPL parameters.          C- Scan visualization, Minimum Intensity Projection in En Face Analysis and 3D display.          Enhance depth imaging (EDI).          Auto fovea finder, auto Disc center for Glaucoma.          Single eye combined report of Macular thickness and RNFL thickness. Combination report of RNFL and Ganglion cell deviation maps.</p>
<p>Software- additional requirement</p>	<p>Percentile value for each sector thickness analysis. High-speed Eye tracking system          Focus Adjustment Range-20D to +20D (diapers) Fixation Internal and External          BOTH Computer with i7 or higher processor should be integrated in the system with at least 22" High Definition Widescreen          Operating System should be latest Windows 10 Enterprise. High-performance multi-core processor          Internal storage: 2TB with 128GB SSD          External computer &amp; LCD display not acceptable. Pupil Size Requirements <math>\leq 2.0</math>mm          DICOM Compliance/compatible.</p>
<p>Certification</p>	<p>USFDA</p>

*Dr. Shikha Agarwal*  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Dr. Prolima Thacker*  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*Professor*  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

*Dr. S.P. Singh*  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*Prof. P.K. Das*  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

### VISUAL FIELD ANALYZER

1. High-quality Goldman standard automated full field Perimetry of International Standard with bowl size radius=30 cm/.
2. Computer & Monitor should be integrated into the perimeter (No external computer).
3. Stimulus size I, II, III, IV&V.
4. Halogen lamp projection system.
5. Background illumination 31.5Asb.- 31:4 Asb
6. Maximum temporal range 90Deg. Suitable for central 30, neurological tests as well as full field testing.
7. Central field test patterns 30-2,24-2,10-2, Macula.
8. Peripheral field test pattern 60-4, Nasal Step, custom test.
9. Threshold test strategies full threshold, SITA Standard, SITA Fast, Full Threshold, Fast Pack, SITA-SWAP.
10. Screening field test P-60, FF-80, FF-120, FF-240, Nasal Step for the periphery.
11. Screening test strategies Two-zone, Three Zone and Quantify Defects.
12. Glaucoma hemi field test, Heijl-Krakau blind spot monitor.
13. Video eye monitoring, Gaze Tracking monitoring system.
14. Vertex Monitoring and Head Tracking.
15. Touch screen on CRT Monitor, Keyboard & provision of external monitor & Keyboard.
16. Internal hard disk drive.
17. Stimulation duration 200ms, wave length Broad band visible light.
18. Stimulus/Background Colour White on White. And Blue-on-Yellow Perimetry
19. SWAP (Blue on Yellow) perimeter.
20. Auto Pupil Measurement.
21. Kinetic testing & Custom Kinetic testing.
22. Motorized chinrest, Motorized table, Laser Jet Printer.
23. Glaucoma Progression Analysis (GPA) Software for Monitoring disease progression. With visit wise graph & Visual Field Index (VFI).
24. Rel Eye monitor.
25. Automated liquid Trial Lens (Auto TLC).
26. HFA DICOM Gateway.  
Optional:
  1. Forum Software for Archiving & Offline analysis of patient data & GPA analysis, Combine report for structural & Functional analysis, Viewer licenses- 3 nos
27. interface: USB
28. Test Storage: user-defined programs , Speciality test library- Esterman .Test.
29. Dimensions: Width: 510mm-790mm Depth: 460mm-723mm Height: 580-850mm Weight:-24-40 kg
30. 10.Electrical Requirements Voltage: 100-230 V , Frequency: 50-60 Hz

CERTIFICATION- USFDA/EUROPEAN CE

*Dr. Shikha Agarwal*  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Dr. Prolima Thacker* Department of Ophthalmology  
 MS (Ophthalmology) DNB K.G. Medical University  
 FRCS (Glasgow) FAICO Lucknow  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*Dr. S.P. Singh*  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*Prof. P.K. Das*  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**CORNEAL TOPGRAPHY**

<b>Features</b>	
Scheimpflug Image	
Scheimpflug imaging for both anterior and posterior curvature of cornea.	
Topography maps of the anterior and posterior corneal surface	
Pachymetry maps	
Elevation maps of the anterior and posterior corneal surface	
3D Anterior chamber analysis	
Anterior segment tomography	
Keratoconus detection and classification, topometrically	
Corneal thickness progression analysis for early keratoconus detection	
Side-by-side comparison of two examinations	
Belin ABCD progression display	
Belin / Ambrosio Enhanced Ectasia Display	
<b>OPTIONAL EXAMINATION FUNCTIONS</b>	
Refractive Software Package	
Camera	Digital CCD Camera
Light source	Blue LEDs (475nm UV-free)
Processor	DSP with 400 mil. Operations per sec.
Speed	50 images in 2 seconds
True Elevation Points	25,000
Weight	Not more than 9 kg.
PC minimum requirements	CPU Intel Core i5, 1 TB SSD, 8 GB RAM, MS Windows 10Pro, VESA, USB Interface.
<b>Measurement Range</b>	
Curvature	3 - 38 mm
	9 - 99 D
Precision	+0.2D
Reproducibility	+0.2D
Operating distance	80mm
<b>CERTIFICATION</b>	USFDA

*Shikha*  
**Dr. Shikha Agarwal**  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Prof. Thacker*  
**Dr. Prolima Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*S*  
**Professor**  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

*S.P. Singh*  
**Dr. S.P. Singh**  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*P.K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCU  
 Dr. RMLIMS, Lucknow

## OPHTHALMOSCOPE (DIRECT)

Specifications: -

Light Source	Halogen Bulb
Spare Bulb Number	1
Filters	1. Cobalt Blue 2. Polarizing Filter 3. Red Free Filter
Power Range of Lens (D)	-25to+25D
Number of Apertures	7
Battery	Rechargeable
Battery Type	Li-ion
Battery Capacity (Mah)	1400mAh
Battery Backup (hrs)	2hrs
Battery Voltage	3.5V
Portable Case	Yes
Coaxial Optics	Yes
Weight	400±50 g
Certification	USFDA/European CE

*Shikha*  
**Dr. Shikha Agarwal**  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Prolima*  
**Dr. Prolima Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*S*  
**Professor**  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

*S.P. Singh*  
**Dr. S.P. Singh**  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*P.K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

### AUTO REFRACTOMETER (HAND HELD)

The device should have the following features:	
The measurement range	sphere-30.00Degto +25.00 Deg (UD=12mm) in 0.01/0.12/0.25 Deg increments.
Cylinder	-10Degto+10deg+/-5 (0.01/0.12/0.25 Deg Increments)
Axis	0 Deg to 180 Deg (1Deg/5 Deg Increments)
Refractive Power	25.96to67.50Deg, n=1.3375(0.01/0.12/0.25DegIncre ment).
Minimum measurable pupil diameter	Should be 2mm
Pupil Distance (PD) measurable range should be	10-85mm (1mm increment)
Central Diameter	Should be 2.0-12.0mm.
Pupilsizerange	should be 1 to 10mm(0.1mmincrement)
Weight	It should be lightweight and has excellent weight distribution.
Design	It should have compact design, easy to hold, balance, and use
Screen	Full graphic LCD with color screen
Automatic Supine position mode	Yes
Melody function-	Yes, for inexperienced patients like children, newly added melody function can be of help. It can ease patient's anxiety and draw attention.
IT analyzes a wide area	(Max.4mm diameter area) pupil zone.
The feature of Auto tracking and auto shooting should be available.	
Power specifications:	Battery Pack-Lithium-ion battery (7.2V 1800 Mah); Station feed: DC 9V, 2 A (maximum)
Standard Accessories:	Occlude (2 units), Neck strap, printer paper (3 rolls), power cord, connection cable, battery pack, dust cover, spherical model eye, carrying case and battery pack
Upgradable with latest and newer facilities preferable	yes
All the accessories and attachments should be original configuration and not compatible assembly.	yes
Certification	USFDA/EuropeanCE
Input voltage	AC (110V-240V input) +/-10%, 60-50Hz and also Battery

Dr. *S. S. Agarwal*  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

Dr. Prolima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

Professor  
Department of Ophthalmology  
K.G. Medical U.  
Lucknow

Dr. S.P. Singh  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

Dr. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Input power	operated
Hand held unit in corporates rechargeable	30VA
Battery powering the system	Yes
Battery backup(hrs.)	6

*Shikha*  
**Dr. Shikha Agarwal**  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Pratima*  
**Dr. Pratima Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*P.K. Das*  
**Professor**  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

*S.P. Singh*  
**Dr. S.P. Singh**  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*P.K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

# HAND HELD AUTOREFRACTOKERATOMETER

The device should have the following features:	
The measurement range	sphere-30.00Deg to +25.00Deg (UD=12mm) in 0.01/0.12/0.25 Deg increments.
Cylinder	-10Deg to +10deg +/-5 (0.01/0.12/0.25 Deg Increments)
Axis	0 Deg to 180 Deg (1Deg/5 Deg Increments)
Radius of curvature	5:00to13:00mm (0.01mm increment)
Refractive Power	25.96 to 67.50 Deg, n=1.3375(0.01/0.12/0.25Deg Increment).
Minimum measurable pupil diameter	Should be 2mm
Pupil Distance (PD) measurable range should be	10-85mm(1mm increment)
Central Diameter	Should be 2.0-12.0mm,
Pupil size Range	Should be 1 to 10 mm(0.1mm increment)
weight	It should be lightweight and has excellent weight distribution.
design	It should have compact design, easy to hold, balance, and use
screen	Full graphic LCD with color screen
Automatic Supine position mode	Yes
Melody function-	Yes, for inexperienced patients like children, newly added melody function can be of help. It can ease patient's anxiety and draw attention.
IT analyzes a wide area	(Max. 4mm diameter area) pupil zone.
The feature of Auto tracking and auto shooting should be available.	yes
Power specifications:	Battery Pack-Lithium-ion battery (7.2V1800 mA); Station feed: DC 9V, 2 A (maximum)
Standard Accessories:	Occluder (2 units), Neck strap, printer paper (3 rolls), power cord, connection cable, battery pack, dust cover, spherical model eye, carrying case and battery pack
Upgradable with latest and newer facilities preferable	yes
All the accessories and attachments should be Original configuration and not compatible assembly.	yes
certification	USFDA/European CE
Input voltage	AC (110V - 240V input) +/- 10%, 60-50Hz and also Battery operated
Input power	30VA
Hand held unit incorporates rechargeable battery powering the system	Yes
Battery backup(hrs)	6
	US FDA CERTIFIED

Dr. Shikha Srivastava  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

Dr. Profima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

Professor  
Department of Ophthalmology  
Lucknow  
K.G. Medical University

Dr. S.P. Singh  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**PERKINS TONOMETER (HANDHELD)**

Type	Should be Applanation contact type (PERKIN'S).
principle	Should be based on Goldmann Tonometry principle
Measuring range	Should have a measuring range from 0 to 78 mm Hg in steps of 2 mmHg.
accuracy	Should have an accuracy of $\pm 0.5$ mmHg
holder	Should have to no grip prism holder.
battery	Should have built in rechargeable battery
controls	Controls should be visible and clearly defined
Labels and markings	Labels and markings should be clear and visible.
holding	Should be comfortable to hold
Option for disposable prism	Yes, should be supplied with at least 20 disposable applanation prisms to minimize the risk of patient cross-contamination
Weight and design	Easy-to-hold, light weight and portable design
Prisms	Compatible with reusable Goldmann tonometer prisms
User friendly	Easy to use and calibrate
illumination.	Should be with bright LED illumination
packing	Supplied in HARD case
<ul style="list-style-type: none"> <li>o Upgradable with latest and newer facilities preferable</li> <li>o USFDA/CE Europeans certification</li> </ul>	Yes, to all
Spare Prism	Should supply 2 no. spare prism.

*Shikha*  
**Dr. Shikha Agarwal**  
 MS, (Ophthalmology)  
 Asso. Professor  
 R.M.L.I.M.S., Lucknow

*Pratima*  
**Dr. Pratima Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*Q*  
**Professor**  
 Department of Ophthalmology  
 K.G. Medical  
 Lucknow

*S.P. Singh*  
**Dr. S.P. Singh**  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*P.K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CC  
 Dr. RMLIMS, Lucknow

## Low vision devices (Low Vision Testing Aids Full Set)

Must include:

1. Sloan Letter Near Vision Card
2. Combination Tumbling E and Landolt C Near Card
3. LOW VISION READING CARD
4. LEA SYMBOLS Single Symbol Book
5. Lea Symbols and Lea Numbers Near Vision Card
6. LEA SYMBOLS Near Vision Card
7. LEA NUMBERS Low Vision Book Left Side Binding Set
8. BRVT The Berkeley Rudimentary Vision Test
9. MNRead Chart In English
10. Prismatic Spectacle Magnifier +6D
11. Prismatic Spectacle Magnifier +12D
12. Prismatic Spectacle Magnifier +16D
13. Illuminated Hand Magnifier 14X30 mm
14. Illuminated Hand Magnifier 10X35 mm
15. Mini folding magnifier 40X30
16. Hobbyhorse magnifier 74X23
17. Chest-support magnifier 2X110
18. Handheld Rectangular magnifier 2X50mmX100mm
19. Bifocal folding mag 105X50
20. Illuminated Stand Magnifier 7x50mm
21. Dome Magnifier 4X80mm, 12D
22. Trestle Stand Magnifier 2X.142\*110mm, 4D
23. Adj. Magnifier 10X35mm, 36D
24. Adj. Magnifier 14X30mm, 52D
25. Adj. Magnifier 12X30mm, 44D
26. illuminated Transparent Magnifier 5X30mm, 16D
27. illuminated Stand Magnifier 8X35mm, 28D
28. Prismatic Spectacle +5D standard
29. Prismatic Spectacle +8D standard
30. Prismatic Spectacle +10D standard
31. Aspheric Spectacle +16D
32. Aspheric Spectacle +20D
33. Aspheric Spectacle +24D
34. 3.25x Spectacle Mounted Monocular Telescope 3.25x
35. Telescope Monocular Hand Held 4x
36. Telescope Monocular Hand Held 6x
37. Binocular SEE TV 2.1x for distance
38. Binocular Spectacle Telescope 3x24mm
39. 2.5X Stand Magnifier 2.5x50mm, 10D
40. Stand Magnifier 4x50mm Double Lens, 16D
41. Stand Magnifier Cutaway 6x, 24D
42. Adj. Stand Magnifier. 8x35mm
43. Adj. Stand Magnifier. 10x35mm,
44. Adj. Stand Magnifier. 12x35mm
45. Adj. Stand Magnifier. 14x30mm
46. Trestle Stand Magnifier 2x. 142x110mm, 4D
47. illuminated Transparent Stand Magnifier 5x30mm, 16D
48. illuminated Stand Magnifier 7x50mm, 24D
49. illuminated Stand Magnifier 8X35mm, 28D
50. LED Stand Magnifier 5x50mm, 20D
51. LED Stand Magnifier 7X32mm, 28D
52. Pocket Magnifier Sliding Waltex 2x, 8D
53. Pocket Magnifier 3x32mm, Square, 12D
54. Pocket Magnifier 6x Deluex, 24D
55. Pocket Magnifier LED 4x, 12D
56. Hand Magnifier 2.5x50mm, 10D
57. Hand Magnifier 2x, 100mm, 4D
58. Hand Magnifier 2.5x80mm, 6D
59. Hand Magnifier 3x60mm, 8D
60. Hand Magnifier 4x50mm, 12D

*Dr. Shikha Jaiswal*  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Dr. Profima Thacker*  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*Professor*  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*Dr. S.P. Singh*  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*Prof. P.K. Das*  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

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61. LED Hand Magnifier 4x50, 12D
  62. LED Hand Magnifier 7x50, 24D
  63. Dome Magnifier 4x50mm, 12D
  64. Dome Magnifier 4x65mm, 12D
  65. LED Dome Magnifier 5x70mm
  66. 2x Bar Magnifier 2x120mm, 8D
  67. Bar Magnifier 5x152mm, 16D
  68. Eye Loupe on Spectacle 16D
  69. Portable Digital Video Magnifier 3.5"
  70. CCTV Mouse Camera For TV & USB
  71. Reading stand 21", Wooden adjustable
  72. Writing Guide A4 size
  73. Reading Guide
  74. Signature Guide
  75. Notex, Note Checker

*Shikha*

*Dr. Shikha Agarwal*  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Pratima*

Dr. Pratima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

Department of Ophthalmology  
K.G. Medical University  
Lucknow

*Dr. S.P. Singh*  
Professor

Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*P.K. Das*

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## BASIC PORTABLE FUNDUS CAMERA

1. Imaging Modalities: Mydriatic and Non Mydriatic
2. Observation Modality: Can be used as direct ophthalmoscope with at least 35 deg field in single view, without camera in mydriatic mode.
3. Photography modes: Color, Red free and Infrared Imaging.
4. Focusing mechanism: Manual and tap to focus.
5. Field of view: At least 40 degrees.
6. Optical Magnification: 10X
7. Diaptor magnification range: -30D to +30D.
8. Working distance: 33mm.
9. Light Source:
  - a. Mydriatic Mode: Cool white LED.
  - b. Non-Mydriatic Mode: Infra-Red and Cool white LED
10. Levels of Illumination: ISO15004 safety assured illumination and levels controllable through software.
11. Regulatory certifications: CE, IEC6060-1 & 2, IEC 62304 (compliant), IEC 62133, ISO15004-1-2 ISO10940, USFDA510k exempt.
12. AC Power adaptor: 9V, 2A external CE marked medical grade adaptor.
13. Camera & Display interface: Apple I phone based camera with integrated Apple I phone based touch display.
14. Camera resolution: 12-megapixel resolution.
15. Form and Construction: Fixed smartphone holder fixed to optical interface.
16. Weight & Dimension (W x D x H): (1.1Kg x 284 x 226mm)
17. Battery & Backup: 7.4V, at least 1500mAH Li-ion rechargeable battery.
18. Environmental:
  - a. Operating temperature 0 degree Celsius to 40 degrees Celsius.
  - b. Relative Humidity 10% to 95%.
19. Acquisition Software: iOS operating System based, with built in Patient Management Software covering Patient Name, ID, Age, DOB, Hospital Name, Doctor name, Address.
20. Offline Artificial Intelligence based software must be provided for detecting referable Diabetic retinopathy and Glaucoma.
21. Artificial Intelligences based software must have approval either from US FDA or Indian regulatory authorities for detecting referable Diabetic Retinopathy and Glaucoma.
22. Indication of Region of Interests:
  - a. For Referrable Diabetic retinopathy: Lesions
  - b. For Referrable Glaucoma: RNFL thinning, Glaucomatous disc, vCDR values)
23. Sensitivity of AI software
  - a. For Referrable Diabetic retinopathy: Minimum 93%.
  - b. For Referrable Glaucoma: Minimum 93.4%.
24. Specificity of AI software
  - a. For Referrable Diabetic retinopathy: Minimum 92.5%
  - b. For Referrable Glaucoma: Minimum 85.4%

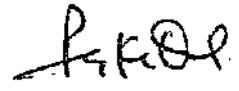
### CERTIFICATION- EUROPEAN CE

  
Dr. Shikha Agarwal  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Prolima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

  
Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

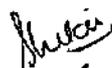
  
Dr. S.P. Singh  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

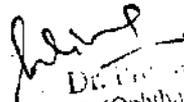
  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## ADVANCED FUNDUS CAMERA (PORTABLE)

1. It should be Handheld Light weight portable modular retinal camera for diagnosis of retinal diseases of the premature babies.
2. Probe weight should be less than 350 gms.
3. Field of view of 100, 130 & 150 degree from the center of the eye using a single lens.
4. Should be able to capture images of the entire eye in a video-mode and should be convertible to an image mode for email.
5. Should have montage image facility.
6. Should have controlled aperture for Universal Screening.
7. Retinal camera should be tele medicine compatible so that the high quality and high resolution images of the infant eye could be shared with anyone anywhere for views.
8. Software should support sending images and receiving diagnosis.
9. Should have high quality image editing tool to convert the film clip of the screening to frames and freedom of selecting frames.
10. Should also assist in image enhancement and compression for faster and efficient transmission.
11. Should have Mydriatic color, Fundus Fluorescein angiography (FFA), Corneal Imaging modes.
12. Automatic FFA filter switch.
13. Should have adjustable intensity, gain, balance, brightness, contrast, and gamma.
14. Still images and burst mode images.
15. Should be compatible for report generation, DICOM export and PACS support and Telemedicine.
16. Camera resolution should be at least 20 MP.
17. Image resolution 2040x2040-24-bit colors.
18. Minimum Pupil diameter 4mm
19. Should supplied with branded laptop/ desktop with following specification: High Speed i5 Processor or more, RAM 16 GB or more, Hard Disk 500 GB or more, Window 10 Display at least 15 inch or more.
20. Scope of supply:  
Handheld Retinal camera, Laptop/ Desktop, Power Console, Foot Control for focusing and intensity control

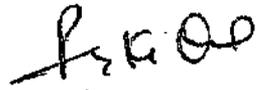
Certifications: USFDA

  
Dr. Shikha Agarwal  
MS, (Ophthalmology)  
Asso. Professor  
R.M.L.I.M.S., Lucknow

  
Dr. P.K. Das  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

  
Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

  
Dr. S.P. Singh  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCU  
Dr. RMLIMS, Lucknow

2.2 D LENS

- 56°/73° field of view
- 2.68x image magnification
- 0.37x laser spot magnification
- 40 mm working distance
- Perfect balance of magnification and field of view for general diagnosis
- Enables examination through small pupils
- FDA APPROVED

*Shikha*  
**Dr. Shikha Agarwal**  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Prolima*  
**Dr. Prolima Thacker**  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*S.P. Singh*  
**PROFESSOR**  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*S.P. Singh*  
**Dr. S.P. Singh**  
Professor  
Dept. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*R.K. Das*  
**PROFESSOR**  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

453  
20 D LENS

- ❖ Known for its balanced performance.
- ❖ The 20D lens provides approximately 3x magnification with a 46° field of view.
- ❖ Its design allows for a comprehensive view of both the central and peripheral retina, making it ideal for general retinal examinations.
- ❖ With a working distance of about 50 mm,
- ❖ This lens offers detailed visualization while maintaining a comfortable distance from the patient's eye.
- ❖ FDA APPROVED

*Shikha*  
*Shikha*  
Dr. Shikha Agarwal  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Prolima*  
Dr. Prolima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*(S)*  
Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*S.P. Singh*  
Dr. S.P. Singh  
Professor  
Dept. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*P.K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

LENS (90-D)

90D Lens:

- ❖ With a lower magnification (0.76x) and a broader field of view (74°).
- ❖ The 90D lens is designed for a comprehensive wide-angle view, ideal for rapid retinal assessments.
- ❖ It is especially helpful for examining the optic nerve head posterior pole and is frequently used in slit lamp Examinations due to its shorter working distance and high-quality imaging
- ❖ FDA APPROVED

*Dr. Shikha Agarwal*  
MS. (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*[Signature]*

Dr. Prebina Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*[Signature]*  
Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*[Signature]*  
Dr. S.P. Singh  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*[Signature]*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## DIAMOND KNIFE (CLEAR CORNEA)

- Phaco Diamond Knife,
- Trapezoid Self-Diving Blade,
- 2.30/2.80 mm,
- Length 117 mm,
- Angled Titanium Handle
- Used to perform the main incision/tunnel (for the introduction of a phaco needle).
- Symmetric sharp edges of the blade ensure even diving inside the tissue with less corneal distortion.
- Profile of the incision is directed to the anterior chamber.
- Titanium handle with locking mechanism.
- Extreme sharpness of the blades.
- Minimal pressure.
- Up to 3000 incisions.
- Natural diamond.
- Predictable cuts and architecture of the wound for more consistent healing.
- Potentially reduced risk of wound leak.
- The cutting edge of 4-10 nm pushes the molecules apart without damaging them and allows the penetration with minimal pressure.

*Shikha*  
**Dr. Shikha Agarwal**  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Prolima*  
**Dr. Prolima Thacker**  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*Professor*  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*S.P. Singh*  
**Dr. S.P. Singh**  
Professor  
Dept. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*P.K. Das*  
**Dr. P.K. Das**  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Digital wide field imaging system with FFA

1. Ultra-Wide field fundus camera with True color with Red, Green & Blue channel split.
2. Colour imaging, Auto fluorescence green, Auto Fluorescence-Blue, infrared reflectance, ICG, FFA.
3. True Color imaging from broad spectrum LED scans
4. Field of view: 125- 133 Deg Wide field one image, 200- 220 Deg Ultra-wide field (Two images), up to 267 Deg with Six image auto montage.
5. Resolution: 7.3micron Optical & 12megapixel sensor.
6. Precision Focus technology
7. Pupil diameter: 2.5mm
8. Working distance: 25mm front Lens to Patient eye.
9. Should have ergonomic chin rest and should have swivel motion and live IR preview.
10. Compensation for Ametropia -24 D to + 20D continuous.
11. Light Source: Res LED 585-640nm, Green LED 500- 585nm, Blue LED 435-500nm & Infrared laser Diode 785nm.
12. Automatic operation: Auto focus, Auto montage, Auto gain & Auto laterality.
13. Acquisition speed: Live IR Preview 10 frames/second & Image capture 0.2 sec.
14. Touch Screen monitor 21-22" Full HD resolution 1920 x 1080 , Multi touch LCD monitor with backlight. Operating System Windows 10 & 8GB internal RAM, 2 TB HDD.
15. DICOM ready System.
16. USFDA approved

*Shikha*  
**Dr. Shikha Agarwal**  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Prolima*  
**Dr. Prolima Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*P*  
**Professor**  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

*S.P. Singh*  
**Dr. S.P. Singh**  
 Professor  
 Dept. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

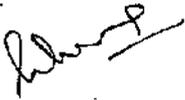
*P.K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

137  
**GRID LENS**

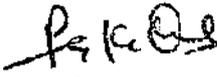
Image Mag: .96x  
Laser Spot Mag: 1.05x  
Contact Diameter: 15.5mm  
Lens Height: 32.5mm  
Static FOV: 90°  
Dynamic FOV: 121°  
USFDA CERTIFIED

  
Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

  
Dr. Shikha Agarwal  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Prolima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. S.P. Singh  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

750  
**IRIDOTOMY LENS**

- 1.70x image magnification
- 0.59x laser spot magnification
- Button design ensures precise placement of the laser beam
- Laser beam should be aimed at the center of the circular button for effective laser transmission
- USFDA CERTIFIED

*Shikha*

**Dr. Shikha Agarwal**  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*S.P. Singh*

**Professor**  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*S.P. Singh*

**Dr. S.P. Singh**  
Professor  
Dept. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*P.K. Das*

**Prof. P.K. Das**  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

# HAND HELD TONOMETER (KEELER)

Brand	Keeler
Measurement Range	5-60mmHg
Type of Instrument	Tonometer
Item Weight	80gm
Usage	Hospital
Model Number/Name	ACCUPEN
Input Voltage Range	3.6 Volt
ACCURACY	+/-2mmHg (compared to goldmann Tonometer)
MEMORY	stores upto 9 measurements & gives the average.
IOP CORRECTION	Auto IOP correction based on pachymeter reading input.
CALIBRATION	No need of calibration on each use.
US FDA CERTIFIED	

*Shukla*  
**Dr. Shikha Agrawal**  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Profima Thacker*  
**Dr. Profima Thacker**  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*Q*  
Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*S.P. Singh*  
**Dr. S.P. Singh**  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*P.K. Das*  
**Prof. P.K. Das**  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

# VISUAL ACUTY CARDS (PAEDIATRIC)

## The Cardiff Pediatric Acuity Test

- designed specifically for acuity measurement in children ages 6 months to 3 years.
- The test may also be helpful in other age groups for people with intellectual impairment, dementia, head injury, or stroke.
- The Cardiff card set - composed of 36 cards providing 24 acuity levels that can be used at either 1 meter or 1/2 meter testing distance with acuity ranging from 20/160 to 20/12.5 equivalent (6/48 to 6/3.75);
- Butterfly Occlude Glasses are also included.
- The test is prepared for preferential looking and presented in vanishing optotype format.
- The target cards are approximately 10.5 x 8 inches (265mm x 203mm) in size, are litho printed on paper and mounted on a plastic substrate.
- The set includes dividers (vinyl), instructional video and other information (on product care etc.).
- The test is boxed in board strengthened polypropylene (red) and dated at time of manufacture.

Certification: US FDA/ EU CE

*Shree*  
Dr. Shikha Agarwal  
MS. (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

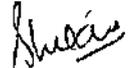
*hlm*  
Dr. Prolima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

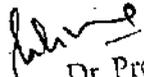
*Q*  
Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*S.P. Singh*  
Dr. S.P. Singh  
Professor  
Dept. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*P.K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

- 160°/165° field of view
- 0.50x image magnification
- 2.0x laser spot magnification
- Available in Flange and no Flange contact options
- Ideal for detecting and treating mid to far-peripheral retinal abnormalities
- 30mm PRP laser lens surface
- USFDA APPROVED

  
Dr. Shikha Agarwal  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Prolima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

  
Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

  
Dr. S.P. Singh  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

70d  
RF CAUTERY

Technical Specifications of CAUTERY MACHINE SPECIFICATIONS (SURGICAL DIATHERMY)		
1	Electro surgical unit	Microprocessor controlled
2	Type of display	LED
3	Footswitch	
4	Mono polar:	Mono polar and bipolar (1 each)
5	Bipolar:	100% washable, two pedal 100% washable, one pedal
6	Reusable patient plates	Yes, 1, both adult and pediatric if disposable: 50-
7	Cautery pencil/forceps with cor:	100 pc for adult and pediatric
8	Mono polar pencil:	Yes
9	Bipolar forceps:	Reusable-1; disposable-50-100pc
10	Universal adaptor	Reusable-1; disposable-50pc
11	Electro surgical pencil tip cleaner	Yes, 1
12	Type of display	Yes
13	Availability of trolley with lockable wheel	LED
14	Availability of advanced cutting modes	+/-
CERTIFICATION		Yes
		ISO/USFDA/ EUROPEAN CE/BIS

*Shukla*  
Dr. Shikha Agarwal  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Prilima*  
Dr. Prilima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*Professor*  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*S.P. Singh*  
Dr. S.P. Singh  
Professor  
Dept. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*Prof. P. Das*  
Prof. P. Das  
Professor & Head  
Dept. of Anaesthesiology & CC  
Dr. RMLIMS, Lucknow

## REDUCTION LENS (BINOCULAR VISUAL SYSTEM FOR VITREO-RETINAL SURGERY)

- BIOM (Binocular Indirect Ophthalmomicroscope) system is specifically designed for vitreo retinal surgery, providing unparalleled precision and clarity.
- Compatible with a range of surgical microscopes
  - Inverts the image to 180 degrees for non-contact wide-angle observation
  - Ideal for vitreous retinal surgery
  - Compatible with various surgical microscope models, including ZEISS Lumera, LEICA M500, TAKAGI OM-18, and more
  - Lightweight design, weighing only 0.8KG
- 1. Inverts the image to 180 degrees for perfect view observation.
- 2. Specifically designed for vitreous retinal surgery.
- 3. Can introduce an image inverter between the objective lens and the eyepiece lens of an operating microscope to produce an upright image for the observer during vitreous surgery.
- 4. Compatible with all kinds of surgical microscopes equipped with an imaging inverter.
- Name: Surgical Image Inverter BIOM System Stereo Indirect Ophthalmoscope
- Weight: 0.8KG
- Usage: Vitreoretinal Surgery
- **Certifications:** US FDA/ EU CE

*Professor*  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*Shikha Agarwal*  
Dr. Shikha Agarwal  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Prolina Thacker*  
Dr. Prolina Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*Dr. S.P. Singh*  
Dr. S.P. Singh  
Professor  
Dept. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*Prof. P.K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

464  
UNIT CHAIR (OPHTHALMOLOGY)

s.no.	Specification parameter	requirement
1.	Patient chair	Cushioned, with back rest, arm rest, footrest
2.	Chair control	Automatic motorized, hydraulic
3.	Chair movement	Up, down, recline upto 180 degree
4.	Chair Seat height	Min 500mm-mmmax1000mm
5.	Chair Up down stroke	160-200mm
6.	Seat rotation	0-180degree
7.	Chair Load lifting	Upto 150-200kg
8.	Stabilizer	required
9.	Width/weight capacity of table	For 2 instruments
10.	Equipped with	Snellen's chart with remote
11.	Space/hanging facility for	Indirect/ direct ophthalmoscope/ retinoscope/trial lens set/ near vision drum/ Snellen's chart projector
12.	Doctors stool/chair	Included
	Certifications	ISO/ EU CE / BIS

*Shikha*  
Dr. Shikha Agarwal  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Prof. Thacker*  
Dr. Profima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*Prof. S.P. Singh*  
Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*S.P. Singh*  
Dr. S.P. Singh  
Professor  
Dept. of Ophthalmology,  
M.L.N. Medical College  
Prayagraj

*Prof. P.K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CC.  
Dr. RMLIMS, Lucknow

# YAG-CAPSULOTOMY LENS

- 1.57x image magnification
- 0.64x laser spot magnification
- Superior optical design provides tight focus to minimize pitting and damaging the IOL
- Laser Window creates a protective barrier to keep internal imaging components safe
- US FDA CERTIFIED

*[Signature]*  
Dr. S. K. ...  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*[Signature]*  
Dr. Prolima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*[Signature]*  
Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*[Signature]*  
Dr. S.P. Singh  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*[Signature]*  
Professor & Head  
Dept. of Anaesthesiology & CCA  
Dr. RMLIMS, Lucknow

**HANDHELD SLIT LAMP**

Product	Binocular Hand held, slit lamp bio microscope, portable
Type	Hand held slit lamp, manual
Purpose	To examine the anterior eye segment, from the cornea epithelium to the Posterior capsule and diagnoses or trauma which affects the structural properties of the anterior eye segment
Utility	New borns, Infants, Pediatrics, Adults, wheelchair-bound, or bed-ridden patients
Compact design, light weight, easy to carry and use	Yes
Optics	Converging binoculars at 13"
Magnification	10x and 16x, lever change
Objective lens working distance @ 10x	100mm-110mm
Objective lens working distance @ 16x	80mm-85mm
Field of view @ 10x	16mm-18mm
Field of view @ 16x	10.5mm
PD Range (mm)	50 to 75
Eye piece dioptric adjustment range	+/-7D
Interpupillary distance (IPD)	49.0mm to 77.0mm (converging), or 38.0mm to 85mm (parallel)
Objective lens focal distance	105-110mm
Objective lens convergence angle	12-14
Slit lamp type	Rotating slit wheel selection slit lamp
Slit length (mm)	10- 12mm (1.0mm - 12mm continuously variable)
Slit width (mm)	Continuously variable from 0 to 12
Slit angle	+/-60 degree
Aperture diameters (mm)	11-12
Filters	Red free
IR protection	In-built IR cut filter
Blue interference filter (FITC) for Corneal examination	Yes

Dr. Shikha Agarwal  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

Dr. Prolima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

Dr. S.P. Singh  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCU  
Dr. RMLIMS, Lucknow

Illumination control	Continuously variable from low to full brightness
Light source	White LED
Slit lamp	LED bulb
Maximum illuminance	$\geq 30000$ Lux
Focus mode	Manual, automatic both
Multi-coated optics for maximum light transmission	Yes
Increase or reduce light intensity by means of rheostat located below the eyepieces on the rear of the grip/handle	Yes
Hand held unit incorporates rechargeable battery powering the illumination system	Yes
Additional detachable Eyepiece	yes
Light weight and Compact	Yes
Rechargeable handle and transformer with plug-in transformer	Yes
Double click trigger located on the front of the grip/handle	Yes
Hand Held device size (LxWxD) (mmxmmxmm)	238x116x210 $\pm$ 5%
Docking station size (LxWxD) (mmxmmxmm)	205x138x40 $\pm$ 5%
Hand held device weight(gm)	900 $\pm$ 5%
Docking station weight(gm)	300 $\pm$ 5%
Net Weight(gm)	700to1500
Input voltage	AC (110V-240Vinput) $\pm$ 10%, 60-50Hz and also Battery operated
Input power	30VA
Battery backup(hrs)	6
Packing kit contains Product operating manual, warranty card, Main and auxiliary spares viz Re-chargeable handle, Test Bar, Power cord, 2x Rubber eye caps, spare bulb etc, Dehumidifier, Cleaning brush, cleaning cloth, Battery in a Aluminum carry case or hard case	Yes
Packing	Individually packed
Capable of stored continuously in ambient storage conditions in ideal circumstances	0degC to 50degC, 15to90%RH
Capable of operating continuously in ambient conditions in ideal circumstances	10degC to 40degC, 15to90%RH
Submission of Test Report from	YES Professor Department of Ophthalmology K.G. Medical University Lucknow

Dr. *Siddha Agarwal*  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

Dr. Prolima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

Dr. S.P. Singh  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*P.K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCU  
Dr. RMLIMS, Lucknow

Central Government/NABL/ILAC accredited Lab to prove the conformity to declared specification at the time of supply	
Product certification	US-FDA/European CE
Submission of all the certifications and test reports to the buyer along with supplies on demand	Yes
Supplier to perform installation, safety and operation checks before handover	Yes
Training of users in operation and basic maintenance shall be provided	Yes
User technical and maintenance manual detailing complete maintaining schedule with routine maintenance should be provided	Yes
Contact details of manufacturer, supplier and local service agent to be provided	Yes

*Dr. Shikha Agarwal*  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Dr. Pooja Thacker*  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*Professor*  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

*Dr. S.P. Singh*  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*Prof. P. Das*  
 Professor & Head  
 Dept. of Anaesthesiology & CC  
 Dr. RMLIMS, Lucknow

## VITREORETINAL SURGERY VITRECTOMY MACHINE

Sr. No	Description / Specifications
01	<p><b>Specifications :</b></p> <p><b>VACCUM :</b></p> <ul style="list-style-type: none"> <li>Should have the facility to generate direct venturi vacuum of up to 650 mmHg through cassette system having 2 independent aspiration ports.</li> </ul> <p><b>CUTTER:</b></p> <ul style="list-style-type: none"> <li>Should have the ability to drive vertical guillotine vitrectomy cutter to go up to 10000 Cuts Per Minute</li> <li>Machine should be on a upgradeable platform with the capability to drive up to 20000 Cuts Per Minute and more in future</li> <li>Should have the facility to allow surgeon to select from 3 different duty cycle options at any given cut rate</li> <li>Should have the 3-D technology to linearly control vacuum and cut-rate simultaneously in vitrectomy mode</li> </ul> <p><b>IOP Control:</b></p> <ul style="list-style-type: none"> <li>Should have the capacity to monitor infusion pressure constantly.</li> <li>Should have the capacity to compensate the infusion pressure constantly with results in a more stable IOP.</li> </ul> <p><b>Illumination:</b></p> <ul style="list-style-type: none"> <li>The system should have dual port Xenon/SOLID STATE/LED Illumination</li> <li>The System should recognize the gauge of illuminator connected and adjust the illumination accordingly</li> <li>The system should have the facility to monitor the bulb life, to avoid surprises.</li> <li>The system should have ancillary dual port Xenon/SOLID STATE/LED Illumination available.</li> </ul> <p><b>Laser:</b></p> <ul style="list-style-type: none"> <li>The System should have inbuilt green laser capability .</li> <li>The Green Laser should have dual port option.</li> <li>Should have a Multifunction Foot pedal</li> <li>The System should have Voice Confirmation</li> <li>The System should have RFID capacity, which recognizes the probe connected, and automatically loads the settings.</li> </ul> <p><b>Phaco Mode</b></p> <ul style="list-style-type: none"> <li>Should have the facility to drive Torsional Phaco, with 4 crystal Hand piece</li> <li>Should have the facility to use variety of Phaco tips like, Kelman, ABS and micro tips</li> <li>Should have the availability of Linear, Pulse, Burst and 3D in Phaco mode</li> <li>Should have the facility to use High Infusion Sleeve.</li> </ul> <p><b>MIVS</b></p> <ul style="list-style-type: none"> <li>Should have the capacity to support MIVS options like 23G, 25G and 27G</li> <li>Should have a single-entry system</li> </ul> <p><b>Other Features:</b></p> <ul style="list-style-type: none"> <li>The System should have the Vented Gas Forced Infusion Capability</li> <li>The System should have the Automated Silicon Oil Injection Capability</li> <li>The System should have Auto Fluid / Air Exchange.</li> <li>The System should have Auto Gas Fill (C3F8 and SF6) option.</li> <li>Should have the fully programmable footswitch with the facility to change</li> </ul>

Dr. Shikha Agarwal  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

Dr. Prolima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

Dr. S.P. Singh  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CC  
Dr. RMLIMS, Lucknow

- procedural modes through footswitch.
- Should have the facility of proportional diathermy.
- Should have the facility to digitally control the infusion pressure and the facility to toggle between a regular infusion pressure and an higher alternate pressure (to achieve tamponade effect) with the help of footswitch.
- Should have the facility for the extrusion of sub-retinal fluid.
- Should have the facility of voice re-confirmation.
- Should have programmability to store various parameters.
- Should have the facility for Anterior Vented Gas forced infusion.
- Should have the facility to use High Infusion Sleeve
- Should have the availability of Linear, Pulse, Burst and 3D in Phaco mode
- Should have the facility of fragmentation with the help of 4 crystal Ultrasound hand piece.
- Should have a mobile tray and tray arm
- MP3 Audio output Jack.

Certification: USFDA

*Shikha*  
**Dr. Shikha Agarwal**  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Pratima Thacker*  
**Dr. Pratima Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*Professor*  
**Professor**  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow.

*S.P. Singh*  
**Dr. S.P. Singh**  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

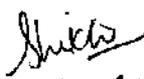
*P.K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

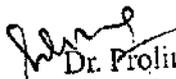
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**TTT ( TRANSTHERMAL THERMOTHERAPY) Laser**

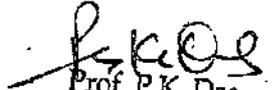
S N	Technical Specification
1	810 nm infrared solid-state laser
2	<b>Treatment Modes</b>
3	CW-Pulse, MicroPulse, LongPulse
4	<b>Pulse Durations</b>
5	CW-Pulse: 10 ms - 9000ms
6	LongPulse: 10 sec. - 30 min
7	MicroPulse : 0.1ms - 1.0ms
8	<b>Exposure Interval</b>
9	50-1000 ms for CW-Pulse and Long Pulse
10	1.0 - 10.0 ms for Micro Pulse
11	<b>Delivery Mode</b>
12	Large Spot Laser Indirect Ophthalmoscope TRANS SCLERAL CYCLOPHOTOCOAGULATION PROBE
13	<b>Treatment Laser Power</b>
14	Infrared Diode Laser (810nm) 0-2000 Mw
15	Certification European CE /USFDA

  
 Professor  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

  
**Dr. Shikha Agarwal**  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

  
**Dr. Prolima Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

  
**Dr. S.P. Singh**  
 Professor  
 Deptt. of Ophthalmology  
 L.N. Medical College  
 Prayagraj

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

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**Non contact tonometer**

**Technical Specification Non- Contact Tonometer**

1. Measurement of IOP without actual eye contact- yes
2. Automatic puff control -yes
3. APC range setting- 40/60
4. Type of display- LCD /LED
5. Facility of touch display screen- Yes
6. Type of measurement mode- singlebutton measurement, touch triple measurement or both
7. Obvious fixation cues- yes
8. IOP measurement range- 1 to 60mmHg
9. Working distance-10-20mm
10. Size of display- minimum 5 inch
11. Machine weight- 15-20 kgs
12. Mode of connectivity- USB
13. Printer connecting facility- yes
14. Auto shutoff power saving facility- yes
15. Chinrest-automated - yes
- joystick- both manual and automated
17. Motorized table- yes
18. voltage - 100/240VAC
19. frequency-50/60Hz
20. UPS- preferred
21. Certification-USFDA/European CE/ISO

*Shucw*  
**Dr. Shikha Agarwal**  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Shucw*  
**Dr. Prabha Thacker**  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*Shucw*  
**Professor**  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*Shucw*  
**Dr. S.P. Singh**  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*Shucw*  
**Prof. P.K. Das**  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow.

## 78D Lens

- ❖ The 78D lens offers around 0.93x magnification with an 81° field of view, allowing for enhanced imaging of the retina with a moderate level of magnification.
- ❖ This lens is particularly effective for detailed views of the optic nerve and posterior pole.
- ❖ It is a popular choice in clinical practice, balancing detailed retinal imaging with a wide viewing area
- ❖ USFDA CERTIFIED

*Shikha*  
**Dr. Shikha Agarwal**  
 MS, (Ophthalmology)  
 Asso. Professor  
 R.M.L.I.M.S., Lucknow

*Prolima*  
**Dr. Prolima Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*8*  
 Professor  
 Department of Ophthalmology  
 K.O. Medical University  
 Lucknow

*S.P. Singh*  
 Professor  
 Dept. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*P.K. Das*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

# 3D DIGITAL SURGICAL OPERATING ZOOM MICROSCOPE with IMAGE GUIDED SURGICAL SYSTEM.

## Main Microscope:

- Magnification/zoom: 1:6 motorized continuous zoom
- Apochromatic optics with anti-reflex multi coating.
- SCI (Stereo coaxial illumination) for constant brilliance and brightness, red reflex illumination and surrounding field illumination both are adjustable.
- There should be motorized retinal protection device activated via foot control or handgrips
- Focusing range 70 mm
- Progressive speed control for zoom and focus
- Apochromatic objective  $f = 200$  mm.
- Motorized Tilt mechanism for main microscope body.
- Tube for main surgeon: Inclined  $0^\circ - 110$  Deg. with electrical image inverter facility for VR surgery with automatic change over for VR & Cataract mode.
- Eyepieces: 10x or 12.5x with diopter setting from  $-8D$  to  $+5D$ .
- Automatic optimization of the microscope image for depth of field or light transmission- controlled by the surgeon.
- Integrated switchable beam splitter, for switching between digital and hybrid visualization during surgery without any loss of brightness - enables the surgeon to operate in hybrid mode with switchable beam splitter.
- Latency: Below 60ms.
- There should be Heads-up modality to operate in more physiological position and reduce fatigue during surgeries.

## Digital Visualization:

- Digital microscope with 2X, 3-chip, full 4K video camera system for higher resolution, magnification, depth perception and a natural color impression.
- Recording: External 4K 3D (2 x 1920 x 1080p) recording with overlays
- Recording: External 4K 2D (3840 x 2160p) recording or streaming without overlays
- Monitor: 55" video 4K 3D medical grade monitor.

## XY Coupling

- Range of adjustment 61 mm x 61 mm. Control of automatic reset of XY movements.
- Provision of inversion of XY direction of travel via foot control, Speed control for XY.

## Floor Stand

- Electromagnetic brakes for effortless movement and positioning, Built in maneuvering handles.
- Dual Illumination system: Main illumination LED with light guide, with backup illumination Xenon 180 W.
- Wireless programmable 14 function foot control panel.
- Storage facility of magnification, motor speed, configuration of foot control panel, lamp brightness and focal plane for at least 9 different users
- Facility for non-sterile release of suspension arm.

*Dr. Shikha Agarwal*  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Dr. Prolima Thacker*  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*Dr. S. R. Das*  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*Prof. R. K. Das*  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

- Light Source: Dual light source, Main illumination LED & alternative Xenon illumination / Backup illumination Xenon.
- Filter: **HaMode filter** for Xenon or LED light source.
- There should be manual mode in the system to continue the surgery in the event of failure of motorized functions.

**Wide Angle Fundus viewing system:**

- Non-contact, Autoclavable wide angle viewing system.
- Non contact lenses 60D & 128D – 2 sets.
- Variable Focus facility via main microscope Foot control. In VR mode Microscope Focus should locked & Focus control of foot control should control Resight Focus for better focus of Retinal image.

**OPTIONAL ITEMS :**

**1. Markerless Toric IOL alignment (Optional)**

- Marker less Toric IOL alignment, Assistance Marker less License\*
- Reference Axis, Capsulorhexis, Main Incision & Paracentesis, LRI, Z ALIGN®, Marker based & Marker less
- Z ALIGN
- Target axis for toric IOL alignment
- Keratoscope function for intraoperative assessment of the corneal curvature
- Can be set directly or imported via usb from IOL Master 700\*
- One or three lines, Position relative to yellow reference axis

**2. Built-in assistant's Microscope ( Optional)**

- Integrated Assistant microscope with continuous motorized magnification/ Zoom system, stereopsis corresponding to that of main surgeon's microscope to get same depth perception of main surgeon and assistant.
- Independent focusing mechanism.
- Independent motorized zoom with freely configurable link/unlink to main observer.
- Inclinable Binocular tube with Integrated image inverter.

**3. Integrated Slit illumination; Slit width 0.2, 2.0, 3.0, 4.0mm**

**4. Integrated keratoscope ring activated via foot control panel or handgrips.**

**Certifications: US FDA**

*Dr. Shikha Agarwal*  
**Dr. Shikha Agarwal**  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Dr. Profina Thacker*  
**Dr. Profina Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

Professor  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

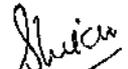
*Dr. S.P. Singh*  
**Dr. S.P. Singh**  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

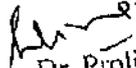
*Prof. P.K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCU  
 Dr. RMLIMS, Lucknow

## Laser Cataract Surgery System (FEMTO CATARACT)

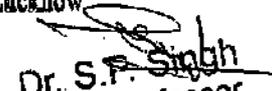
1. The system should be designed for Laser Cataract Surgery and FDA approved for doing Capsulotomies, Lens Fragmentation, Arcuate incisions, Cataract incisions
2. The system should do complete capsulotomies with precision within 50µm. System should be able to centre the capsulotomies automatically based on pupil, limbus or scanned capsular bag.
3. Should do Lens fragmentation that simultaneously segments and softens the cataract enabling near elimination of ultrasound energy in majority of cases.
4. Should be capable of Anterior penetrating as well as intrastromal arcuate incisions for Astigmatism correction. Capability to do multi planer cataract incisions.
5. Laser should be solid state near infrared femtosecond laser preferably <600fs with a repetition rate of more than 100khz
6. OCT should capture the full volume data of the anterior segment. There should be algorithms for automated surface mapping of the anatomy of the anterior segment and the laser should be guided by these algorithms.
7. The patient interface should be liquid filled non applanating. Docking should be gentle with minimal intraocular pressure rise. On an average OP should not rise by more than 12mm HG.
8. Should have option of small size interface for small eye aperture patients.
9. Should have port for streaming video and taking patient reports in PDF format
10. Should have integrated patient bed, to be supplied along with the machine.
11. Should work in Indian conditions of temp and humidity. At least should work in the following range:
  - Temperature: 15°C to 30°C Temperature-controlled environment
  - Relative humidity: 0 to 80%
  - Electrical: 200-240 V AC, Single Phase, 15 A

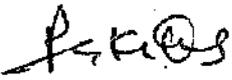
Certifications: US FDA

  
**Dr. Shikha Agarwal**  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

  
**Dr. Prolima Thacker**  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

  
Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

  
**Dr. S.P. Singh**  
Professor  
Dept. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

  
**Prof. P.K. Das**  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

# FEMTOSECOND LASER FOR LENTICULE EXTRACTION

- 1. TREATMENT OPTIONS :** FLAP creation module for femto-lasik, for Myopia, HYPEROPIA module using lenticular extraction procedure, Astigmatism, Retreatment/enhancement module, Future upgradable module for ICR, & Keratoplasty.
2. Centration aid using computer-controlled function for easy centration by using pupil center and vertex position. Fully Automatic Cyclotorsion adjustment through our existing optical biometry. Reliable software module to create users nomograms
3. **Treatment laser repetition frequency :** Minimum 1.8 MHz or more
4. **Should be capable to** Create the lenticule in less than 10 seconds and complete a flap cut in approximately 5 seconds
5. *Narrow spot and track spacing. myopia with optical zone 6.5 mm. flap diameter  $\leq$  8.0 mm, spot distance 4.5  $\mu$ m, track distance 2.0  $\mu$ m.*
6. Ultrasound sensors assist in actuating the robotic arms. Integrated top-view, side-view and therapy cameras
7. For retreatment option there should be an additional inbuilt software module to convert the initial cap created with Lenticule extraction into a flap. The actual retreatment is then performed as LASIK procedure
- 8 smart & Intelligent robotic features to monitor continuously the patient's position and make automatic adjustments, (Right on the target) the interactive touchscreen and intuitive software assist the surgeon and the assistant at every step throughout the procedure.
9. The complete integrated high-quality surgical microscope ensures precise and complete visual control during every manual surgical manipulation. With 5 magnification steps and it additionally includes an integrated digital video camera for recording surgical procedures.
10. Integrated Slit projector & integrated (Inbuilt) UPS with the machine.
11. There must be provision for refractive workplace for digitally connected, easy to manage, evaluate, store & transfer data (Patient data management) with remote data transfer facility wirelessly with the machine.

## EXCIMER LASER :

- Integrated Argon fluoride (ArF) premix gas Excimer LASER with replaceable gas cylinders. The Excimer Laser should be of International repute with European CE/ FDA approval. Laser should be of Small spot size & Gaussian beam profile to produce high quality corneal ablation, aspheric beam profile.
- Multiple Treatment Algorithms :** The LASER should have the capability of carrying out Aspheric ablation profiles without any license fee as standard treatment, should also have Tissue saving mode, PRK, PTK and Customized treatments.
- Future upgradability to Topography-guided treatment procedure
- Pulse Duration = 5-20ns
- Pulse should be precise and accurately controls every single laser pulse.
- Optical path: machine should have closed optical path with vacuum.
- Treatment range: the system should be able to correct a minimum range up to - 12 D (Myopia) to + 3 D (Hyperopia), >5D (astigmatism) with reliable results. The system should have an International LASIK approval range with proven track records.

Dr. *Shikha Agarwal*  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

Dr. *Polima Thacker*  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

Dr. *S.P. Singh*  
Professor  
Dept. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

Prof. *P.K. Das*  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

... delivery system to have Flying spot for high repetition speed frequency 250Hz or higher.

System should be able to handle a maximum ablation size of 7 mm (Optical zone up to a maximum of 7mm).

Eye Tracker : Multiple tracking system with Active eye tracking, IR1000 HZ & above, Limbus tracker, Pupil tracking

Simple LASER calibration: provision with Test Foil/PMMA plate

Imported High Quality Surgeon chair: portable with height adjustment & back support.

Motorized OT table bed with the combined use of the pivoting patient supporting system between the femtosecond system and the excimer laser

Operating microscope with integrated HD video camera (without external attachment) & inclinable binocular tube, should be inclinable up to 0 -180 Degree.

Plume evacuator should be integrated with facilities for flushing as well as suction.

It should have capability of Presbyopia correction Algorithm using mikro monovision technique freedom to select Preoperative spherical aberration and Functional age with Treatment range: -8.0 D to +2.0 D, including emmetropic and astigmatism up to 2.0 cyl.

Excimer laser machine should be able to communicate with Femto Second Laser including patient data transfer. Same patient bed should be used for Excimer Laser & Femto Second Laser

The Machine should not require N2 flushing gas systems.

The system should have integrated Assistant Work station to facilitate high output of patient flow.

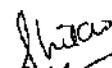
The system should have Touch screen based Patient Data Management for optimum adaptation to clinic-specific workflow.

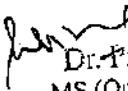
The system should have DUAL FREQUENCY capability for Surface & Intra stromal ablations. HDMI output possible.

Wavelength 193 nm or more

Certification: US FDA

  
Professor  
Department of Ophthalmology  
K.O. Medical University  
Lucknow

  
Dr. Shikha Agarwal  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Prolima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. S.P. Singh  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. R.M.L.I.M.S., Lucknow

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# Ultra wide field fundus camera with FFA with inbuilt OCT

- Imaging device with optomap-guided OCT,
- produces a 200° single-capture retinal image of unrivalled clarity in less than ½ second and, with just a touch,
- should capture swept source OCT scans anywhere on the optomap®

- Automatic rescan function offers precise follow-up scanning
- Non-mydriatic cSLO images effectively through most cataracts

and small pupils

- 1050 nm OCT light source provides deeper tissue penetration

for clear, detailed choroidal imaging

- 3-in-1 Color Depth Imaging highlights structural data from retinal surface through choroid

- OptosAdvance Image Management software streamlines image review and consultations

- Explorer view shows retinal surface and OCT scans in a single view

- DICOM compatible software supports compliance with the Code of Federal Regulations

optomap Ultra wide field Imaging

## IMAGING MODALITIES

- Color
- Sensory (red-free)
- Choroidal
- Autofluorescence (AF)
- Fluorescein (FA)
- Indocyanine Green (ICG)

RESOLUTION optomap: 20 µm, optomap plus : 14 µm

## LASER WAVELENGTHS

- Blue Laser: 488 nm (for FA)
- Red laser: 635 nm
- Green laser: 532 nm (for AF)

*Dr. Shalini Arora*  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Dr. Prolima Thacker*  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*Professor*  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*Dr. S.P. Singh*  
Professor  
Dept. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*Prof. P.K. Das*  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Wavelength: 1050 nm (for ICG)

EXPOSURE TIME OCT Imaging

SIGNAL TYPE Less than 0.4 seconds

Optical scattering from tissue

SIGNAL SOURCE Swept Source OCT, Wavelength 1050 nm

OPTICAL POWER Laser safety Class-1 following IEC/EN60825-1:2014

AXIAL RESOLUTION\*

< 7 micron

TRANSVERSE RESOLUTION\*

< 20 micron

SCANNERS Galvanometric X, Y pair

SCAN DEPTH Up to 2.5 mm

A-SCAN RATE Up to 100k cycles/sec

SCAN TYPES System

FOOT PRINT Line Scans Width: 6, 14, 23 mm

Volume Scan Height: Min 3.5 mm; Max 9 mm

Volume Scan Width: Min 6.0 mm; Max 14 mm

Width: 540 mm / 22 in

Depth: 570 mm / 23 in including chin rest

Height: 683 - 707 mm / 27 - 28 in

WEIGHT Max 45 kg

TABLE SPACE REQUIREMENTS Width: 887 mm / 35 in

Depth: 600 mm / 24 in

Height: 725 to 1205 mm / 29 - 48 in

COLORS White with aqua trim

SYSTEM VOLTAGE 100-240V, 50/

Certification: US FDA

Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

*Shikha Agarwal*  
Dr. Shikha Agarwal  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

*Frolima Thacker*  
Dr. Frolima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

*S.P. Singh*  
Dr. S.P. Singh  
Professor  
Dept. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*P.K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

# Guarded Calibrated Diamond Knife (For LRI)

Blade Style	3 to 5 different blade configurations
Handle	Overall length 105 to 107mm Consists of two scales (Main and Secondary)
Main Scale	1 Division= 0.3 to 0.5mm (300 to 500 microns)
Secondary Scale	1 Division=0.01mm (10 microns) 1 Revolution= 0.5mm (500 microns)
Blade Depth	Can be set from 0 to 1mm with a scale measuring 0.01 (10microns) increment
Guard and Calibration	Present
Certification:	US FDA

*Shikha*  
**Dr. Shikha Agarwal**  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Pratima*  
**Dr. Pratima Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*Q*  
**Professor**  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

*S.P. Singh*  
**Dr. S.P. Singh**  
 Professor  
 Dept. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*P.K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

# SPECIFICATION OF SPECULAR MICROSCOPE (Eye Bank for Donor Cornea)

Field of view	1000x750 micrometre
Maximum Analysis area	400x300 micron each (up to 4 areas)
Camera	CMOS
Illumination	Halogen Lamp
Moving range of Stage	X:16mm, Y:16mm, Z:16mm
Input Voltage	AC100-240V, 50/60Hz
Power consumption	80VA
Dimensions	Approximately 300 (H)x 225 (W)x 275 (D) mm
Weight	8kg
Accessories	Chamber Holder, Chamber cap, Chamber Adaptors, Vial Adaptor Set (Vial Lid, Vial Adaptor, Spacer, Holder)
Enhance illumination	optionally available
Specular image	Present
2x Zoom imaging	Present
Analysis (centre method, flex centre method)	Present
Built in pachymeter	Present
Real time media temperature sensor	Present
Donor enhance image	optionally available
Full graft image	Recordable
Measurement Tools on full graft image	Diameter, length, area
OS	Windows"7Pro 32-bit SP1
Disk Device	CD-ROM Drive
RAM	4GB or higher
Display Resolution	1920 x 1080 or higher

**Certification: US FDA**

*Shikha*  
**Dr. Shikha Agarwal**  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Prolima*  
**Dr. Prolima Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*KS*  
**Professor**  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

*S.P. Singh*  
**Dr. S.P. Singh**  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*P.K. Das*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

# Specifications of Automated Lamellar Dissector for DSAEK

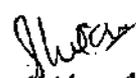
## A. Control Unit

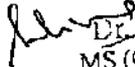
Dimensions	500×250×200mm
Weight	15kg
Ambiant temperature	20-36°C
Non-condensing humidity	45% to 75%
Voltage/cycles	100V/50-60Hz 240V/50-60Hz
External fuse	500mA high switching power
Battery capacity and Type (Inside the control unit)	12V-7Ah (PB)
Fuse (inside the control unit)	3.15 AT and 500mA
Inlet console supply	4-6 bars
Outlet: turbine supply	2.5 to 3.5 bars
Protection against electric shock	Safety class BF (according to IEC 60601-1)
Compliance	IEC 60601-1 CE 01 20 ISO 9001-2008 version FDA registered

- B. Handpiece (DSAEK Set-Liner)
- C. Consumables for 50 Patients
- D. Stabllfser for the machine.

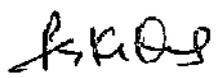
**Certification: US FDA**

  
 Professor  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

  
**Dr. Shikha Agarwal**  
 MS, (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

  
**Dr. Protima Thacker**  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

  
**Dr. S.P. Singh**  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

# TECHNICAL SPECIFICATIONS FOR VISUAL ELECTROPHYSIOLOGY SYSTEM

Console	<ol style="list-style-type: none"> <li>1. Advanced real-time acquisition system with integrated power Isolation</li> <li>2. Direct pattern generator</li> <li>3. Isolated auxiliary line outlets to meet medical leakage current standards</li> <li>4. All-digital filtering</li> </ol>
Amplifier	<ol style="list-style-type: none"> <li>1. Which provide the high resolution &amp; ultra-low noise</li> <li>2. Should not over-range</li> <li>3. Common mode rejection &gt;100 dB</li> </ol>
Stimulations available	<ol style="list-style-type: none"> <li>1. Ganzfeld full-field ERG</li> <li>2. Multi-focal ERG</li> <li>3. Pattern ERG</li> <li>4. EOG</li> <li>5. VEP</li> </ol>
Computer	Desktop fully supporting the test software with large storage facility
Software	<ol style="list-style-type: none"> <li>1. Multiple operator modes</li> <li>2. Automatic blink rejection &amp; Filtering of Data</li> <li>3. Peak/trough detect &amp; measure</li> <li>4. Real-time access to all parameters of the protocol during testing</li> <li>5. User Friendly Database System</li> </ol>
Console Dimensions (WxDxH)	15 x 12 x 3 inches-20 x 15x 5 inches
Weight	10-25 KG
Certification	US FDA

*D. Shikha Prasad*  
 MS, (Ophthalmology)  
 Asso. Professor.  
 Dr. R.M.L.I.M.S., Lucknow

*Dr. Profima Thacker*  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*Professor*  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

*Dr. S.P. Singh*  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*Prof. P.K. Das*  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

Teflon block

Specification:

- Aspheric curvature to match corneal curvature
- Central hole to help in accurate positioning
- Can be used with or without an endothelial punch
- EO Sterile
- CE Certification

*Dr. Shikha Agrawal*  
 MS. (Ophthalmology)  
 Asso. Professor  
 Dr. R.M.L.I.M.S., Lucknow

*Dr. Prolima Thacker*  
 MS (Ophthalmology) DNB  
 FRCS (Glasgow) FAICO  
 Assistant Professor, Ophthalmology  
 Dr. R.M.L.I.M.S., Lucknow

*Professor*  
 Department of Ophthalmology  
 K.G. Medical University  
 Lucknow

*Dr. S.P. Singh*  
 Professor  
 Deptt. of Ophthalmology  
 M.L.N. Medical College  
 Prayagraj

*Prof. P.K. Das*  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**Cryosurgical Units, Ophthalmic (Co2 And N2o)**

**1. USE**

1.1

Clinical purpose

Cryosurgical units designed for applying extreme cold to eye tissues to destroy abnormal cells. These units usually consist of a hollow probe (cryo probe) that circulates a cryogenic substance (e.g. liquid nitrogen) to form an ice crystal ball around the cells, which freezes the cells of the tissues with which it comes into contact. Ophthalmic cryosurgical units are used mainly to treat eye tumors (e.g., retinoblastoma), to relieve ingrown eyelashes (trichiasis), for cryo extraction of intra capsular cataracts, and/or to repair retinal detachment.

1.2

Used by clinical department/ward

Ophthalmology - Operating theater, Operating room.

**TECHNICAL**

**2. TECHNICAL CHARACTERISTICS**

2.1

Technical characteristics (specific to this type of device)

1. Cryogen shall be CO2 and N2O.
2. Cryosurgical unit capable of achieving temperatures at the cryo tip below -79°C (-110.2°F) for CO2, -89°C (-128.2°F) for N2O.
3. Should have Active and Passive defrosting system.
4. Cryosurgical procedures require several different probe designs. Special probes are used based on the surgical procedures. Cryosurgical units with multiple probe tips can enable physicians to perform a number of specialized procedures. Should be supplied with all kinds of probes required for ophthalmology and all cryo probes must be autoclavable.
5. Operating pressure 400 to 850 psi.
6. The unit shall have a trigger mechanism to control the freeze/thaw cycle (active defrost preferred but not essential), removable circular, closed design cryo tips with flat surfaces or with a cone extrusion not

Dr. Shikha Chaturvedi  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

Dr. Prolima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow

Prof. P.K. Das  
Dept. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

Prof. P.K. Das  
Professor & Head  
Dept. of Anesthesiology & CCM  
Dr. RMLIMS, Lucknow

		exceeding 5 mm, insulated cryo shaft of length 170 mm to 200 mm, hose assembly (high pressure) with cylinder connector, pressure gauge and relief valve, and exhaust port to which a hose can be connected to safely vent the exhaust gas. 7. Due to the adverse effects of chronic exposure to waste anesthetic gases, nitrous oxide units should have scavenging ability.
2.2	User's interface	Manual
2.3	Software and/ or standard of communication (where ever required)	NA
<b>3. PHYSICAL CHARACTERISTICS</b>		
3.1	Dimensions (metric)	NA
3.2	Weight (lbs, kg)	NA
3.3	Noise (in dBA)	NA
3.4	Heat dissipation	NA
3.5	Mobility, portability	Portable
<b>4. ENERGY SOURCE (electricity, UPS, solar, gas, water, CO2 ....)</b>		
4.1	Power requirements	NA
4.2	Battery operated	NA
4.3	Protection	NA
4.4	Power consumption	NA
<b>5. ACCESSORIES, SPARE PARTS, CONSUMABLES</b>		
5.1	Accessories, (mandatory, standard, optional); Spare parts (main ones); Consumables/reagents (open, closed system)	1. Cryo probes to according the specific use (Preferably 3 sizes (1.5 mm, 2 mm, 3 mm)). 2. Integral timer and temperature indicator. 3. Should be supplied with rolling cart. 4. Should be supplied with unfilled cylinder for N2O or CO2.
<b>BIDDING/PROCUREMENT TERMS/DONATION REQUIREMENTS</b>		
<b>6. ENVIRONMENTAL AND DEPARTMENTAL CONSIDERATIONS</b>		
6.1	Atmosphere/Ambience (air conditioning, humidity, dust ...)	1. Operating Condition: Capable of operating continuously in ambient temperature of 5 to 40 deg C and relative humidity of 15 to 90% in ideal circumstances.
6.2	User's care, Cleaning, Disinfection & Sterility Issues	1. Disinfection: Parts of the Device that are designed to come into contact with the patient or the operator should either be capable of easy disinfection or be protected by a single use/ sterile disposable

Dr. Shikha Agarwal  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

Dr. Pratik Chatterjee  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

Department of Ophthalmology  
K.O. Medical University  
Lucknow  
Dr. S.P. Singh  
Professor  
Dept. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

		2. Sterilization required.
<b>7. STANDARDS AND SAFETY</b>		
7.1	Certificates (pre-market, sanitary,...); Performance and safety standards (specific to the device type); Local and/or international	Should be US FDA/CE/BIS/CDSCO/ approved (USFDA/CE requirements will be applicable only when the Indian standards like BIS/CDSCO are not available.) 1. Manufacturer should have ISO 13485 certification for quality standards.
<b>8. TRAINING AND INSTALLATION</b>		
8.1	Pre- installation requirements: nature, values, quality, tolerance	Availability of 5 Amp/15 Amp. Electrical Socket.
8.2	Requirements for sign-off	Manufacturer and authorized supplier to perform installation, safety and operation checks before handover. Local clinical staff to affirm completion of installation.
8.3	Training of staff (medical, paramedical, technicians)	Training of users in operation and basic maintenance shall be provided. Advanced maintenance tasks required shall be documented.
<b>9. DOCUMENTATION</b>		
9.1	Operating manuals, set manuals, other manuals	Should provide 2 sets(hard copy and soft copy) of: 1. User, technical and maintenance manuals should be supplied in English/Hindi/Regional language along with machine diagrams; 2. List of equipment and procedures required for local calibration and routine maintenance; 3. Service and operation manuals(original and Copy) to be provided; 4. Advanced maintenance tasks documentation; 5. Certificate of calibration and inspection, 6. Satisfactory certificate for any existing installation from government hospital.
9.2	Other accompanying documents	List of essential spares and accessories, with their part number and cost;

Dr. *S. Singh*  
MS, (Ophthalmology)  
Asso. Professor  
Dr. R.M.L.I.M.S., Lucknow

Dr. Profima Thacker  
MS (Ophthalmology) DNB  
FRCS (Glasgow) FAICO  
Assistant Professor, Ophthalmology  
Dr. R.M.L.I.M.S., Lucknow

Professor  
Department of Ophthalmology  
K.G. Medical University  
Lucknow  
*S.P. Singh*  
Professor  
Deptt. of Ophthalmology  
M.L.N. Medical College  
Prayagraj

*P.K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCU  
Dr. RMLIMS, Lucknow

# Orthopaedis



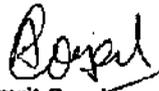
## Declaration Certificate about Technical Specifications related to Department of Orthopaedic by committee members

SR.NO.	NAME OF EQUIPMENT	GO NUMBER	APPROX. COST
1.	ADVANCED ARTHROSCOPIC SYSTEM	GO-23-AUG-18 SUCHI - 4	1-1.2 CRORE
	BASIC ARTHROSCOPIC SYSTEM	GO-06-MAR-18 SUCHI - 3	50-60 LACS
2.	ADVANCED HAND SURGERY INSTRUMENT SET	GO-06-MAR-18 SUCHI - 3	8-10 LACS
3.	ASSORTED INSTRUMENT ORTHOPAEDICS	GO-23-AUG-18 SUCHI - 4	2-3 LACS
4.	BASIC BATTERY OPERATED DRILL SYSTEM	GO-23-AUG-18 SUCHI - 4	2-4 LACS
	BATTERY DRILL MACHINE IMPORTED	GO-23-AUG-18 SUCHI - 4	20-25 LACS
	(LARGE & SMALL BONE CUTTING)	GO-23-AUG-18 SUCHI - 4 GO-7-DEC-2022	
5.	HIP PRESERVATION SET	GO-7-DEC-2022	4-6 LACS
6.	MENISCUS REPAIR SET	GO-06-MAR-18 SUCHI - 3	4-5 LACS
7.	RADIOLOUCENT ORTHOPAEDIC OT TABLE	GO-06-MAR-18 SUCHI - 3	20-25 LACS
8.	PELVIC INSTRUMENT SET	GO-23-AUG-18 SUCHI - 4	5-6 LACS
9.	PLASTER CUTTING EQUIPMENTS	GO-23-AUG-18 SUCHI - 4	0.5-1 LACS
10.	BASIC INSTRUMENT SET (FOR FRACTURE)	GO-23-AUG-18 SUCHI - 4	2 - 4 LACS
11.	MICRO SPINE GENERAL INSTRUMENTS FOR SPINE SURGERIES WITH VERTEBRAL BODY DISTRACTOR	GO-06-MAR-18 SUCHI - 3	40-45 LACS

This is to certify that technical specification of all the above-mentioned machine/instruments, approved by the technical committee is not of any specific company. The technical features of the equipment/instruments from all reputed firms in the current market have been included in this specification to the best of my knowledge and belief & in the opinion of the technical committee.

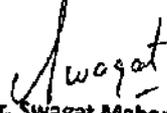
The technical specification duly signed by the technical committee members is attached herewith.

Dr. Narendra Singh Kushwaha  
Professor  
Department of Orthopaedic  
KGMU, Lucknow

  
Dr. Amrit Goyal  
Professor  
Department of Orthopaedic  
Medical College, Agra

  
Dr. Vineet Kumar  
Professor (JG)  
Department of Orthopaedic  
DR. RMLIMS, Lucknow

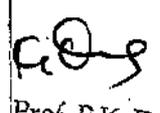
  
Prof. P.K. Das  
Chairman  
Technical Specifications committee  
Clinical Subjects & others  
Head, Department of Anesthesiology & CCM  
DR RMLIMS, Lucknow

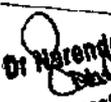
  
Dr. Swagat Mahapatra  
Professor (JG)  
Department of Orthopaedic  
DR. RMLIMS, Lucknow

### Technical Specification for Advanced Arthroscopic System

S.No.	Product Description
<b>A</b>	<b>Camera System Specification</b>
1	Should be an integrated system housing the camera controller and power source for a traditional fiber optic cable.
2	Should come with a connector interface that enables the camera and traditional fiber optic light guide to be connected to the system without having to connect at the monitor.
3	The connector interface should have a USB port which can be connected to the recording system for memory transfers.
4	Should have 3 CMOS image sensors.
5	Should have a display image resolution of 4096 X 2160.
6	Should have an aspect ratio of 17:9.
7	Should have video outputs of display port, 12G-SDI, HDMI, and 3G-SDI.
8	Should have a sensitivity of F8 at 2000lx or 3200K.
9	Should have an electronic zoom up to 2:1, controlled by the camera head button.
<b>B</b>	<b>4K Camera Head</b>
1	Camera head should come with 5 button interface for controlling all functions of the system.
2	Should have technology to protect against drops.
3	Camera head should be lightweight 1.34 lbs.
4	Should have a cable length of 12 ft.
5	Should be compatible with all standard eye cup scopes.
<b>C</b>	<b>Electronic Light Guide</b>
1	Should come with new technology rather than traditional light source.
1	Should come with self-illumination medical-grade high-efficiency device.
<b>D</b>	<b>Touch Recording System</b>
1	Should be touch sensitive.
2	Should be able to capture images up to 1920 X 1080.
3	Should be able to capture video up to 720p, 1080i, 1080p, 50/60HZ.
4	Should have a hard drive capacity of 1 TB.
5	Should have 2 HDMI video inputs.
6	Should have an HDMI video output.
7	Should be able to accept USB drives for memory transfer.
8	Should be able to review images and recordings.
9	Should have PACS, DICOM, and enhanced EMR facility
10	Should have HL7 Compliance & must be cybersecured.

  
**Dr. Vineet Kumar**  
 Professor (Junior Grade)  
 Dept. of Orthopaedics  
 RMLIMS, Lucknow

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
**Dr. Narendra Singh Kushwaha**  
 Senior Professor  
 Department of Orthopaedic Surgery  
 King George's Medical University U.P.  
 Lucknow

  
**Dr. Swagat Mahapatra**  
 Professor (Jr. Gr.)  
 Dept. of Orthopaedics  
 RMLIMS, Lucknow

Shaver System Complete	
<b>E</b>	<b>Shaver Console</b>
	Should have innovative touch screen graphic user interface. Touch screen should allow for easy access to the menu settings instead of relying on dip switches in the back of the console. Some common settings include window indexing, day-to-day settings, variable footswitch, speed (forward/reverse and oscillate) and voice/tone setting.
1	Should have voice control
2	Should have voice control
3	Console should offer irrigation pump facility.
4	Should have the facility to attach two handpieces and one footswitch.
5	Should have input voltage of 100-240 VAC
6	Should have total port output 325 VA
7	Should have pump flow rate 0 -150 ml/minute
8	Should have dimensions of 35.6 cm W X 14.2 cm H X 41.9cm D
9	Should weigh 14 lbs or less
<b>F</b>	<b>Shaver Handpiece</b>
1	Should be made of Anodized aluminium and Stainless steel
2	Shaver Hand Piece should have 2 button
3	Should have operating speed of 500- 12,000rpm, forward/reverse
4	Should have operating speed of 500 - 4000 cpm, Single and muti run oscillate
5	Should be adaptable to thorne/drill Chuck for small drilling
6	Should have nominal torque of 24.7 NCm
7	Should have length of 15.5cm
8	Should weigh less than 600g
9	Should have Non detachable cord length of 3.6 meters
<b>G</b>	<b>Shaver Footswitch</b>
1	Should have dimension of 25.4 cm W X 4.75 cm H X 12.0 cm D
2	Should have approximate cord length 3 meters
3	Should have weight of 1.58kg
<b>H</b>	<b>RF System and Probes</b>
	The system should have applied rating of type BF applied part with defibrillation proof
1	The system should have applied rating of type BF applied part with defibrillation proof
2	It should have continuous mode of operation with intermittent loading
3	Should have touch screen interface to control ablation and coagulation
4	Input Voltage should be 240 VAC and frequency of 50/60HZ
5	Overall dimensions should be 31.7cm W X 22.8cm H X 35.6cm D
6	Should have weight of 11.43kg
7	Should have power output of 400Watts

Dr. Swagat Mahapatra  
Professor (Jr. Gr.)  
Deptt. of Orthopaedics  
Dr. RMLIMS, Lucknow

Dr. Vineet Kumar  
Professor (Junior Grade)  
Dept. of Orthopaedics  
Dr. RMLIMS, Lucknow

Prof. P.K. Das  
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Dept. of Anaesthesiology &  
Dr. RMLIMS, Lucknow

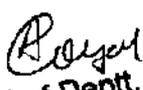
Head of Deptt. Ortho.  
S.N Medical College, Agra

Dr. Narendra Singh Kushwaha  
Professor  
Department of Orthopaedic Surgery  
King George's Medical University U.P.  
Lucknow

8	Should have temperature measurement range of 20 to 60 degree celcius
9	Should accept both <b>Monopolar &amp; Bipolar probes</b>
10	Should have Real time intrarticular temperature monitoring & control feature
11	Should have be activated by a wired footswitch along with hand control probes also.
12	System should come with <b>probes without any timer.</b>
13	Probes should be available in 30 deg, 50 deg and 90 deg sizes
14	Probes should have hand controlled buttons too
15	Mode switch should be possible through console, footswitch and probe
1	<b>Limb Positioning System for Future Upgradation from same OEM-</b>
1	The system should be made up of carbon fiber material for light weight and easy manoeuvrability.
2	The system should be used for shoulder, knee and ankle procedures for less clutter at the medical facility.
3	The system should be able to unlock and position with a simple push of a pedal.
4	The system should run on hydraulic fluid and not on electric, batteries or pressurized air, which is necessary for fail safe mechanism, low maintenance cost and minimal downtime.
5	The system should have one fixed arm, one telescopic arm, one hydraulic hose and one foot pedal with release and locking lever.
6	The system should also have 2 clamping handles, one bed rail clamp, one coupling stem and ball joint, one ball housing joint and one lower ball joint.
7	The system should offer different attachments for different shoulder, knee and ankle procedures such as Shoulder beach chair, Shoulder lateral decubitus, Knee attachment and ankle attachment.
8	The system should have all traction unit and connector for various attachments.
9	The system should not require additional weights for traction, no additional pulleys and no use of Velcro straps.
10	The system should come with disposable kits for shoulder, knee and ankle attachments.
1	<b>Fluid Pump specification</b>
1	Should have continuous mode of operation with intermittent loading
2	Should have input voltage of 100 - 240 VAC
3	Should have maximum set pressure at 150mmHg and minimum set pressure at 30mmHg
4	Should have irrigation flow rating in the range of 0 - 2500ml/min
5	Should have weight of approximate 3.2 kg
6	Should have dimensions: 6.5" (16.5 cm) tall, 8" (20.3 cm) deep and 7.75" (19.7 cm) wide
7	Should come with a remote feature to control pressure
8	Remote should come with a tamponade assist mode which allows surgeon to increase set pressure by 20mmHg.

  
Dr. Swagat Mahapatra  
Professor (Jr. Gr.)  
Deptt. of Orthopaedics  
Dr. RMLIMS, Lucknow

  
Dr. Vineet Kumar  
Professor (Junior Grade)  
Deptt. of Orthopaedics  
Dr. RMLIMS, Lucknow

  
Dr. Rajesh  
Head of Deptt. Ortho.  
S.N Medical College, Agra

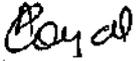
  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

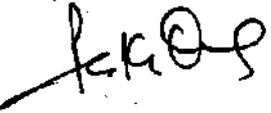
  
Dr. Narendra Singh Kushwaha  
Professor  
Department of Orthopaedic Surgery  
King George's Medical University U.P.  
Lucknow

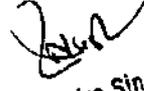
K	<b>Certification</b>
1	It should have IEC 60601 & IEC 62304.
2	It should be USFDA & EU CE approved from a 4-digit notified body.
L	<b>Scope of Supply</b>
1	All the above mentioned items are included in the supply scope with a quantity of 01 Nos.

  
 Dr. Swagat Mahapatra  
 Professor (Jr. Gr.)  
 Deptt. of Orthopaedics  
 Dr. RMLIMS, Lucknow

  
 Dr. Vinod Kumar  
 Professor (Junior Grade)  
 Deptt. of Orthopaedics  
 Dr. RMLIMS, Lucknow

  
 Head of Deptt. Ortho.  
 S.N Medical College, Agra

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

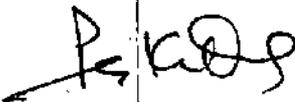
  
 Dr Narendra Singh Kushwaha  
 Professor  
 Department of Orthopaedic Surgery  
 King George's Medical University U.P.  
 Lucknow

## Basic Arthroscopic System

S.No	Product Description
A	<b>Camera Controller &amp; head</b>
1	Image sensor should be FULL HD 3 CMOS
2	Should have minimum resolution of 1920 x 1080 Pixel, in DVI /HD-SDI format
3	Progressive Scan should be 3-Chip CMOS
4	Aspect Ratio should be 16:9 or better
5	Preferred Sensitivity should be maximum 16 Lux at F2.8 to get optimum color resolution at 3200K color temperature.
6	Camera should have Multi-specialty system setting.
7	Should have fully autoclavable camera head feature.
8	Signal to noise ratio should be less than 55dB
9	Video Outputs should be - HD-SDI -2, S-video-1, DVI-D- 2, composite-1
10	Should have Electronic Zoom upto 2:1 controllable by camera head button
11	Camera cable length should be at -least 12ft.
12	Camera head weight should not exceed 205g without cable
13	white balance should be automatic triggered by controller front or camera head
14	Camera Head should be ShockFlex for durability
15	Facility to operate LED or Xenon Light Source from Camera
16	It should have Programmable buttons & menu keys on head. Atleast four Programme could be set .
17	It should have functions like scope size, gain, brightness, zoom
18	Should have built-in communication from camera head to the light source for ease-in-control of light output with standby option To avoids excessive heat at the scope"
19	Camera Controller unit should be used remotely to activate a digital recording system for capture and record still image via camera head
B	<b>Direct LED Light source</b>
1	Lamp life should be minimum 20,000 hours or more
2	It must be mercury free
3	It should have at least 90W lamp
4	lamp color temperature must be greater than 6000Kdeg
5	Brightness should have a range from 0-100%
C	<b>FIBRE OPTIC LIGHT GUIDE CABLE</b>
1	Must be completely autoclavable
2	Should be metal braided and heat resistance
3	Must be transparent to Visualize bundled light fibers for an easier way to determine wear and required replacement.
4	Should have dimension range 4.8mm to 5mm

  
Dr. Swagat Mahapatra  
Professor (Jr. Gr.)  
Deptt. of Orthopaedics  
Dr. RMLIMS, Lucknow

  
Dr. Vineet Kumar  
Professor (Junior Grade)  
Deptt. of Orthopaedics  
Dr. RMLIMS, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

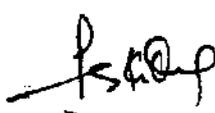
  
Dr. Narendra Singh Kushwaha  
Professor  
Department of Orthopaedic Surgery  
King George's Medical University U.P.  
Lucknow

  
Dr. Rupal  
Head of Deptt. Ortho  
S.N Medical College, Agra

<b>D</b>	<b>HD LED MEDICAL GRADE MONITOR</b>
1	Should have Rapid signal detection, robust mode tables
2	Supports wider range of digital and analog inputs/outputs including dual DVI, dual 3G SDI and SOG
3	Must be calibrated to clinical color spectrum (BT709 Industry Standard).
4	Must have Image pan, zoom, freeze, picture-in-picture and picture-by-picture
5	Should have In plane switching display panel
6	Screen size should be 26" or more with resolution 1920x1080 with a refresh rate of 60HZ
7	Pixel pitch should be 0.3 (H)mm X 03 (V)mm
8	should have display colors of 1.07 billion colors or more
9	Should have Contrast ratio of 1400:1
10	Should weigh less than 9Kg without stand
11	Should have wireless option
<b>E</b>	<b>Shaver Handpiece</b>
1	Should be made of Anodized aluminium and Stainless steel
2	Shaver Hand Piece should have 2 button
3	Should have operating speed of 500- 12,000rpm, forward/reverse oscillate
4	Should have operating speed of 500 – 4000 cpm, Single and muti run
5	Should be adaptable to thorne/drill Chuck for small drilling
6	Should have nominal torque of 24.7 NCm
7	Should have length of 15.5cm
8	Should weigh less than 600g
9	Should have Non detachable cord length of 3.6 meters
<b>F</b>	<b>Shaver Footswitch</b>
1	Should have dimension of 25.4 cm W X 4.75 cm H X 12.0 cm D
2	Should have approximate cord length 3 meters
3	Should have weight of 1.58kg
<b>G</b>	<b>RF System and Probes</b>
1	The system should have applied rating of type BF applied part with defibrillation proof
2	It should have continuous mode of operation with intermittent loading
3	Should have touch screen interface to control ablation and coagulation
4	Input Voltage should be 240 VAC and frequency of 50/60HZ
5	Overall dimensions should be 31.7cm W X 22.8cm H X 35.6cm D
6	Should have weight of 11.43kg

Swagat Mahapatr:  
Professor (Jr. Gr.)  
Dept. of Orthopaedics  
RMLIMS, Lucknow

  
Vinet Kumar  
Professor (Junior Grade)  
Dept. of Orthopaedics  
Dr. RMLIMS, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Narendra Singh Kushwaha  
Professor  
Department of Orthopaedic Surgery  
King George's Medical University U.P.  
Lucknow

7	Should have power output of 400Watts
8	Should have temperature measurement range of 20 to 60 degree celcius
9	Should accept both <b>Monopolar &amp; Bipolar probes</b>
10	Should have Real time intrarticular temperature monitoring & control feature
11	Should have be activated by a wired footswitch along with hand control probes also.
12	System should come with <b>probes without any timer.</b>
13	Probes should be available in 30 deg, 50 deg and 90 deg sizes
14	Probes should have hand controlled buttons too
15	Mode switch should be possible through console, footswitch and probe
<b>H</b>	<b>Limb Positioning System for Future Upgradation from same OEM -</b>
1	The system should be made up of carbon fiber material for light weight and easy manoeuvrability.
2	The system should be used for shoulder, knee and ankle procedures for less clutter at the medical facility.
3	The system should be able to unlock and position with a simple push of a pedal.
4	The system should run on hydraulic fluid and not on electric, batteries or pressurized air, which is necessary for fail safe mechanism, low maintenance cost and minimal downtime.
5	The system should have one fixed arm, one telescopic arm, one hydraulic hose and one foot pedal with release and locking lever.
6	The system should also have 2 clamping handles, one bed rail clamp, one coupling stem and ball joint, one ball housing joint and one lower ball
7	The system should offer different attachments for different shoulder, knee and ankle procedures such as Shoulder beach chair, Shoulder lateral decubitus, Knee attachment and ankle attachment.
8	The system should have all traction unit and connector for various attachments.
9	The system should not require additional weights for traction, no additional pulleys and no use of Velcro straps.
10	The system should come with disposable kits for shoulder, knee and ankle attachments.
<b>I</b>	<b>Fluid Pump specification</b>
1	Should have continuous mode of operation with intermittent loading
2	Should have input voltage of 100 - 240 VAC
3	Should have maximum set pressure at 150mmHg and minimum set pressure at 30mmHg
4	Should have irrigation flow rating in the range of 0 - 2500ml/min
5	Should have weight of approximate 3.2 kg

Swagat Mahapatra  
Professor (Jr. Gr.)  
Dept. of Orthopaedics  
RMLIMS, Lucknow

Dr. Vineet Kumar  
Professor (Junior Grade)  
Deptt. of Orthopaedics  
Dr. RMLIMS, Lucknow

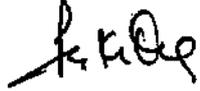
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

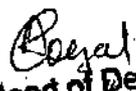
Dr. Narendra Singh Kushwaha  
Professor  
Department of Orthopaedic Surgery  
King George's Medical University U.  
Lucknow

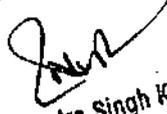
6	Should have dimensions: 6.5" (16.5 cm) tall, 8" (20.3 cm) deep and 7.75" (19.7 cm) wide
7	Should come with a remote feature to control pressure
8	Remote should come with a tamponade assist mode which allows surgeon to increase set pressure by 20mmHg.
<b>J Certification</b>	
1	It should have IEC 60601 & IEC 62304.
2	It should be USFDA & EU CE approved from a 4-digit notified body.
<b>K Scope of Supply</b>	
1	All the above mentioned items are included in the supply scope with a quantity of 01 Nos.

  
 Dr. Swagat Mahapatra  
 Professor (Jr. Gr.)  
 Deptt. of Orthopaedics  
 Dr. RMLIMS, Lucknow

  
 Dr. Vineet Kumar  
 Professor (Junior Grade)  
 Deptt. of Orthopaedics  
 Dr. RMLIMS, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Head of Deptt. Ortho.  
 S.N Medical College, Agra

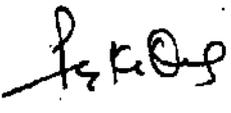
  
 Dr Narendra Singh Kushwaha  
 Professor  
 Department of Orthopaedic Surgery  
 King George's Medical University U.P.  
 Lucknow

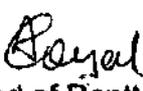
### Advanced Hand Surgery Instrument Set

Rochester-Ochsner Forceps	2
Allis Tenaculum Forceps	2
TC Derf Needle Holder Serr	2
TC Crile-Wood Needle Holder Narrow	2
TC Ryder Micro Needle Holder Serrated	2
Stevens Tenotomy Scissors Delicate	2
TC Metzenbaum Scissors	2
TC Reynolds Scissors	2
Semkin Dressing Forceps Delicate	2
Semkin Tissue Forceps 1 x 2 Teeth Delicate	2
Extra Delicate Iris Scissors	2
Extra Delicate Mayo Scissors	2
Metzenbaum Scissors	2
Hartmann Mosquito Forceps	2
Halsted Mosquito Forceps	2
Adson Dressing Forceps Serrated	2
Adson Tissue Forceps 1 x 2 Teeth	2
Adson Brown Forceps Side Grasping	2
Allis Forceps 4 x 5 Teeth 6"	2
Extra Delicate Allis Forceps 4 x 5 Teeth 5"	2
Freer Dissector Double End S/B 7"	2
Joseph Hook 1 Prong Sharp 6 1/4"	2
Joseph Hook 2 Prong Sharp 2 mm 6 1/4"	2
Frazier Suction Tube 8 French	2
Backhaus Towel Clamp	2
Cushing Nerve and Vein Retractor 9"	2
Crile Retractor D/E 4 1/2"	2
US Army Retractor (Set of 2)	2
Senn Retractor Double End Sharp 6 1/4"	2
Ballenger Sponge Forceps Str Serr 7"	2
Ballenger Sponge Forceps Cvd Serr 7"	2
Foerster Sponge Forceps Str Serr 9 1/2"	2
Stainless Steel Sterilizing Box with Silicone matt	1
<b>Certification:</b>	
USFDA/EUCE	

  
 Dr. Swagat Mahapatra  
 Professor (Jr. Gr.)  
 Deptt. of Orthopaedics  
 Dr. RMLIMS, Lucknow

  
 Dr. Vineet Kumar  
 Professor (Junior Grade)  
 Deptt. of Orthopaedics  
 Dr. RMLIMS, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Head of Deptt. Ortho.  
 S.N Medical College, Agra

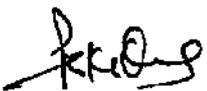
  
 Dr. Narendra Singh Kushwaha  
 Professor  
 Department of Orthopaedic Surgery  
 King George's Medical University U.P.  
 Lucknow

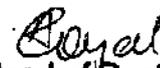
<b>Basic Battery Operated Drill System</b>		Qty.
<b>The Cannulated Battery handpiece</b>		1
The diameter of cannulation 4 mm		
Weight of handpiece <1.5 kg with battery		
Power of the system 170 W		
Speed with attachments upto 1500 rpm		
There separate forward and reverse triggers		
Handpiece compatible with radiolucent drive		
Instant change between clockwise and counterclockwise rotation possible		
The system fully autoclavable		
Reliable protection of soft tissue with integrated oscillation mode		
<b>Battery</b>		2
Has Li-Ion batteries, control unit & motor inside		
Mode Selector Switch to select Drilling/Reaming, Saw, Oscillating Drill mode		
There a display indicating the battery capacity status		
Button to diagnose errors in the system		
Weight of battery <800 GM		
No self discharging of batteries and no memory effect there in the batteries		
The capacity of the Battery 1.2 Ah		
Maximum charging time between < 60min		
Battery voltage 20-30V		
Batteries are Safe and easy to handle in the operation theatre		
<b>Sterile Cover</b>		1
Made of Stainless Steel		
Fully autoclavable		
For sterile transfer of Power Module to Battery Hand piece		
<b>Universal Battery Charger II</b>		1
4 charging bays		
Capable of charging NiCd, NiMh and Lithium Ion batteries		
Display the charging status of the batteries		
Keeps inserted batteries constantly fully loaded		
<b>Drill Chunk attachment</b>		1
Diameter of cannulation 4 mm		
Maximum speed atleast 13000 rpm		
Maximum Torque 3 Nm		
<b>AQ/ASIF Quick Coupling for Medullary Reaming</b>		1
Diameter of cannulation 4 mm		
Maximum Speed 330 rpm		
Maximum Torque atleast 10 Nm		
<b>Quick Coupling for K-wire</b>		1
Continuous adjustment facility for wire diameter from 1 to 4 mm		
Maximum Speed atleast 1300 rpm		

  
**Dr. Narendra Singh Kushwaha**  
 Professor  
 Department of Orthopaedic Surgery  
 King George's Medical University U.P.  
 Lucknow

  
**Dr. Swagat Mahapatr**  
 Professor (Jr. Gr.)  
 Deptt. of Orthopaedics  
 Dr. RMLIMS, Lucknow

  
**Dr. Vineet Kumar**  
 Professor (Junior Grade)  
 Deptt. of Orthopaedics  
 Dr. RMLIMS, Lucknow

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
**Head of Deptt. Ortho.**  
**S.N Medical College, Agra**

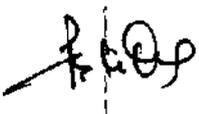
<b>Sagittal Saw attachment</b>	
Maximum oscillating frequency atleast 10,000 osc/min.	1
Saw Blade for General Traumatology	
Certifications: USFDA/EUCE	5



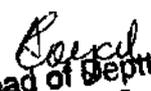
Dr. Swagat Mahapatra  
Professor (Jr. Gr.)  
Deptt. of Orthopaedics  
Dr. RMLIMS, Lucknow



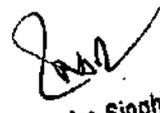
Dr. Vineet Kumar  
Professor (Junior Grade)  
Deptt. of Orthopaedics  
Dr. RMLIMS, Lucknow



Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow



Head of Deptt. Ortho.  
S.N Medical College, Agra



Dr Narendra Singh Kushwaha  
Professor  
Department of Orthopaedic Surgery  
King George's Medical University U.P.  
Lucknow

## Assorted Instruments Orthopaedic

## 1. Orthopaedic Nail Extractor Set

S. No.	Description	Qty
1	EXTRACTOR ROD	1
2	HANDEL FOR EXTRACTOR	1
3	HAMMER FOR EXTRACTION ROD	1
4	T WRENCH 10 MM CANNULATED	1
5	CONICAL BOLT	1
6	20MM TAPRED THREAD TPI	1
7	22MM TAPRED TPI	1
8	24 MM TAPRED TPI	1
9	26 MM TAPRED TPI	1
10	28 MM TAPRED TPI	1
11	16 MM TAPRED TPI	1
12	CONICAL EXTRACTION REAMER (For Removal of I.L. Nails)	1
13	For 9,10,11, mm Nails	1
14	For 12,13,14 mm Nails	1
15	Sterlization Box For Interlocking Nail Removal S.S	1

## 2. Broken Screw Removal Set (Orthopaedic Assorted Instrument)

S.No.	Description	Qty
1	Screw Driver Shaft Q.C End 2.5mm Tip	1
2	Screw Driver Shaft Q.C End 3.5mm Tip	1
3	Sharp Hook	1
4	Hollow Reamer For Removal of Damage Screw 3.5 & 4.0mm	1
5	Hollow Reamer For Removal of Damage Screw 4.5 & 6.5mm	1
6	Extraction Screw Conical for 2.7/3.5/4.0mm Screws	1
7	Extraction Screw Conical for 4.5/6.5mm Screws	1
8	Drill Bitt Plain Shank High Speed 2.5mmx55mm Length	1
9	Drill Bitt Plain Shank High Speed 3.5mmx70mm Length	1
10	Gouge with Fiber Handle Straight 10mm	1
11	Q.C Tap Handle Long	1
12	Screw Removal Forcep	1
13	Sterlization Box with Two Trays	1

## 3. Bipolar Hemi Arthroplasty Set

S. No.	DESCRIPTION	Qty
1	HIP HEMI ARTHROPLASTY SET It should INCLUDES	
1	Moor Hallow Chisel	1
2	Murphy Lane Bone Skid	1
3	Iduet Auger Extractor	1
4	Rasp for Austin Moor with Tomy Bar	1
5	Measuring Gauge (37mm to 55mm)	1
6	Nylon Faced Impactor	1

Dr. Narendra Singh Kushwaha  
Professor  
Department of Orthopaedic Surgery  
King George's Medical University U.P.  
Lucknow

Dr. Swagat Mahapatra  
Professor (Jr. Gr.)  
Deptt. of Orthopaedics  
Dr. RMLIMS, Lucknow

Dr. Vineet Kumar  
Professor (Junior Grade)  
Deptt. of Orthopaedics  
Dr. RMLIMS, Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

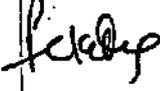
Head of Deptt. Ortho.  
S.N Medical College, Agra

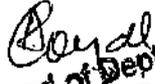
BIPOLAR HEMI ARTHOPLASTY SET (HIP) It Should INCLUDES		
1	REAMERS (Pencil, Tapered, & Slotted) 1 Each	1
2	Rasp for Bipolar with Tomy Bar	1
3	Impactor	1

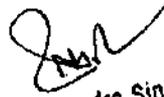
Should be ISO/CE/USFDA Certified.

  
 Dr. Swagat Mahapatra  
 Professor (Jr. Gr.)  
 Deptt. of Orthopaedics  
 Dr. RMLIMS, Lucknow

  
 Dr. Dr. Vineet Kumar  
 Professor (Junior Grade)  
 Deptt. of Orthopaedics  
 Dr. RMLIMS, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Head of Deptt. Ortho.  
 S.N Medical College, Agra

  
 Dr Narendra Singh Kushwaha  
 Professor  
 Department of Orthopaedic Surgery  
 King George's Medical University U.P.  
 Lucknow

302

## Battery Drill Machine Imported ( Large & Small Bone Cutting System)

S. No.	Product Description
<b>A Dual Trigger Drill/Ream battery Handpiece</b>	
1	The system should have Battery Operated Universal Dual Trigger handpiece for drilling and Reaming, along with a dedicated handpiece for small procedures.
2	Handpiece should be fully cannulated with minimum dia of 3.2mm-4.0mm
3	The system should have Forward and Reverse direction control on the handpiece and Oscillation mode for drilling.
4	The system should have Screw insertion /Tap mode, and Safe mode.
5	The system should have fluid ingress protection with ratings of IPX6 and IPX8.
6	The weight of the handpiece should be between 600-900g.
7	The handpiece should not be plastic, it should be a metal body to prevent accidental breakage.
8	The handpiece should be compatible with other variants of company systems of past and future, for the low cost of ownership. Should not force to upgrade attachments.
9	The system should have power output in the range of 230W – 275W
10	The system should have minimum drilling speed range of 0 – 1200 rpm
11	The system should have minimum reaming speed range of 0 – 400 rpm
12	The system should have reaming torque up to 15 Nm
<b>B Oscillating saw battery Handpiece, QTY-1.</b>	
1	Head of the handpiece should be rotatable in multiple positions.
2	The system should have fluid ingress protection tri seal technology with ratings of IPX6 and IPX8
3	The weight of the handpiece should be Less than 1kg.
4	The system should have an minimum oscillating speed range of 0 – 10000 CPM.
5	The system should have an oscillating range of 4.5 deg.
6	The system should have less vibration and less acoustic noise up to 100 DB.
<b>C Reciprocating saw battery handpiece, QTY-1.</b>	
1	The system should have fluid ingress protection tri seal technology with ratings of IPX6 and IPX8
2	The weight of the handpiece should be < 1 Kg
3	The system should have a reciprocating speed range of 0 – 15000 CPM.
4	The system should have less vibration and less acoustic noise up to 100DB.
<b>D Battery Charger-QTY-1.</b>	
1	Should have charging bay for at least 4 batteries.
2	Charging time should be Less than 02 hours.
3	Should have a display of the charging status of batteries.
<b>E Battery Kit-</b>	
1	The system should be compatible with non-autoclavable battery-Ni-Mh with a voltage output of 9.6V – 12V, Qty-4 Or Lithium ion batteries
2	It should come with a sterile battery case for protection qty-3.
3	Sterile battery transfer Shroud, qty-3.

  
**Dr. Narendra Singh Kushwaha**  
 Professor  
 Department of Orthopaedic Surgery  
 King George's Medical University U.P.  
 Lucknow

  
**Dr. Swagat Mahapatra**  
 Professor (Jr. Gr.)  
 Deptt. of Orthopaedics  
 Dr. RMLIMS, Lucknow

  
**Dr. Vivek Kumar**  
 Professor (Junior Grade)  
 Deptt. of Orthopaedics  
 Dr. RMLIMS, Lucknow

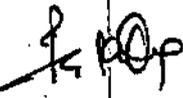
  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

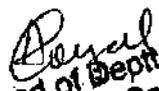
  
**Head of Dept. Ortho.**  
**S.N Medical College, Agra**

F	Attachments: QTY-1 EACH.
1	The system should come with an intramedullary and acetabular reaming attachment with AO quick coupling. Reaming speed of the attachment should be in the range of 200 - 450RPM.
2	The system should come with Jacobs Chuck & key. The opening diameter should be 4 to 6mm.
3	The system should come with a quick coupling K- wire driver with a range of 0.7mm to 1.6mm.
4	The system should have an AO-Quick coupling drilling attachment.
5	Hudson Reamer Attachment
6	The system should have a High-speed drill Attachment for revision joint surgeries for cement removal, metal and bone shaping with 1 burr guard.
7	The system should come with a case for storing and autoclaving the equipment (same manufacturer.) The case along with Tray.
8	All products must be from the same manufacturer only.
9	All products Must be USFDA Approved.
10	Should have all relevant IEC Certifications such as IEC 60601 & IEC 62304

  
 Dr. Swagat Mahapatra  
 Professor (Jr. Gr.)  
 Dept. of Orthopaedics  
 Dr. RMLIMS, Lucknow

  
 Vineet Kumar  
 Professor (Junior Grade)  
 Dept. of Orthopaedics  
 Dr. RMLIMS, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Head of Dept. Ortho.  
 S.N Medical College, Agra

  
 Dr Narendra Singh Kushwaha  
 Professor  
 Department of Orthopaedic Surgery  
 King George's Medical University U.P.  
 Lucknow

## Hip Preservation Set

S.No.	Product Description	Qty
1	Straight Pelvic Osteotome 15 mm	1
2	Straight Pelvic Osteotome 20 mm	1
3	Curved Pelvic Osteotome 15 mm	1
4	Curved Pelvic Osteotome 20 mm	1
5	Double Curved Pelvic Osteotome 15 mm	1
6	Double Curved Pelvic Osteotome 20 mm	1
7	Flag Pelvic Osteotome 15 mm	1
8	Flag Pelvic Osteotome 20 mm	1
9	Pelvic Osteotome 15 mm	1
10	Pelvic Osteotome 20 mm	1
11	Curved Pelvic Osteotome 15 mm	1
12	Curved Pelvic Osteotome 20 mm	1
13	15 mm Straight Pelvic Osteotome	1
14	20 mm Short Curved Pelvic Osteotome	1
15	15 mm Pelvic Osteotome	1
16	20 mm Pelvic Osteotome	1
17	Hammer	1
18	3.5 mm Screw Driver	1
19	Malleable Retractor 300 mm long 25 mm width	1
20	Blunt Pelvic Retractor	2
21	Radiolucent Hohman Retractor 30 mm	2
22	Radiolucent Hohman Retractor 22 mm wide Tip	6
23	Spoon Retractor	6
24	Femoral Head Template 37 mm	1
25	Femoral Head Template 39 mm	1
26	Femoral Head Template 41 mm	1
27	Femoral Head Template 43 mm	1
28	Femoral Head Template 45 mm	1
29	Femoral Head Template 47 mm	1
30	Femoral Head Template 49 mm	1
31	Femoral Head Template 51 mm	1
32	Femoral Head Template 53 mm	1
33	2 mm x 9" guide wire	1
		5

Dr. Swagat Mahapatra  
Professor (Jr. Gr.)  
Deptt. of Orthopaedics  
Dr. RMLIMS, Lucknow

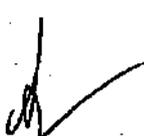
Vineet Kumar  
Professor (Junior Grade)  
Deptt. of Orthopaedics  
Dr. RMLIMS, Lucknow

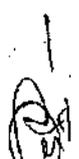
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

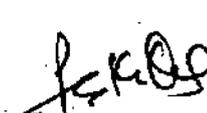
Boyal  
Head of Deptt. Ortho.  
S.N. Medical College, Agra

Dr. Narendra Singh Kushwaha  
Professor  
Department of Orthopaedic Surgery  
King George's Medical University U.P.  
Lucknow

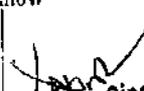
34	Osteotomy Angle Measuring Spreader Guide		2
35	Osteotomy Gap Measuring Guide		2
36	Osteotomy Spreader 220 mm, 10 mm width		2
37	Radio-opaque Triangles for measuring Femoral Osteotomy angles (40°/50°/90°), (30°/60°/90°), (20°/60°/100°), (30°/70°/80°)		1 each different sizes
38	Variable Angle Wire Guide for Femoral Osteotomy		1
39	Bending Iron for Recon Plates		1 pair
40	Bending Pliers for Recon Plates		1
41	In situ Bending Pliers for Recon Plates		1 pair
42	In situ Bending Handle for Recon Plates		2 each
43	Thin Long Osteotomy Chisels (with Gradation markings) - 10, 15, 20, 25 mm		1
44	DHS Guide Wire Indirect Measuring Device		2
45	Large perforated Anodized aluminum / Stainless Steel Autoclaving Box with Modular Tray and silicone padding that can safely accommodate all the above instruments		
46	Up to 2 mm of size difference between the specification of Retractors and Forceps from those being quoted is permissible.		
47	The instruments should be of improved steel (except malleable retractors) with high precision quality.		
	<b>Certification</b>		
48	Should be ISO/CE approved		

  
Dr. Swagat Mahapatra  
Professor (Jr. Gr.)  
Deptt. of Orthopaedics  
Dr. RMLIMS, Lucknow

  
Dr. Vineet Kumar  
Professor (Junior Grade)  
Deptt. of Orthopaedics  
Dr. RMLIMS, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCU  
Dr. RMLIMS, Lucknow

  
Head of Deptt. Ortho.  
S.N. Medical College, Agra

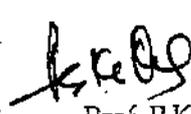
  
Dr. Narendra Singh Kushwaha  
Professor  
Department of Orthopaedic Surgery  
King George's Medical University U.P.  
Lucknow

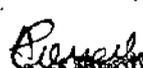
## Meniscus Repair Set

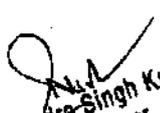
S.NO.	PRODUCT DESCRIPTION	QTY
A	Two Arms meniscus repair needles:	
1	Should consist of two 10" flexible stainless steel needles	2
2	Size of the needles should be 0.6mm and should be connected by a 30" strand of size #2-0 Suture.	
3	Suture should be made of UHMWPE.	
4	The needles should be designed to perform inside out meniscus repair	
5	Should be compatible with meniscus cannulas	
B	Single Meniscus repair needles:	
1	Should have Nitinol needle with eyelet comprises of only needle with a loop at the end.	
2	Needles should be made up of NiTi (Nickel & Titanium)	10
3	Should have a diameter of 0.024 inch or 0.6096mm	
C	Meniscus Cannulas for specific zones in the meniscus-	
1	Should have six pre-bent cannulas to provide optimum access to all zones of meniscus such as anterior, middle, and posterior zones	6
2	Should have Pre-bent structure of cannula which replicate tibia and femoral anatomy for easy insertion	
3	First bent should be superior to inferior to manipulate the femoral curvature while entering the space	
4	Second bent should be in lateral plane to manipulate tibial anatomy which is where meniscus is seated	
5	Six pre-bent cannulas should feature thin barrels, fluid venting, and safe loading	
6	Should come with instrument tray.	
7	Should have necessary certificates such as USFDA & EU CE.	1

  
 Dr. Swagat Mahapatra  
 Professor (Jr. Gr.)  
 Dept. of Orthopaedics  
 Dr. RMLIMS, Lucknow

  
 Dr. Vineet Kumar  
 Professor (Junior Grade)  
 Dept. of Orthopaedics  
 Dr. RMLIMS, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Head of Deptt. Ortho.  
 S.N Medical College, Agre

  
 Dr Narender Singh Kushwaha  
 Professor  
 Department of Orthopaedic Surgery  
 King George's Medical University U.P.  
 Lucknow

## RADIOLUCENT ORTHOPAEDIC OT TABLE

S.No.	Product Description
1	State of Art Operation Table for performing advance surgeries suitable for all major surgeries, General, bariatric surgery. It should be highly technical, sturdy, durable, jerk free, compact and user friendly and corrosion proof. OT Table should be of international standards.
2	It should be C- arm compatible electrically controlled hydraulic drive. All table top movements like elevation, side tilt, Trendelenburg, flex / reflex at various point and their reciprocal movement, should be power actuated and achievable by single press of a button on the remote control.
3	Should be supplied with all standard accessories for performance of major surgeries like head rest, two arm boards, anesthesia screen, restraint straps.
4	Length of table including head rest, should be atleast 2000mm.
5	Width without side rails, minimum 500 mm or more
6	Minimum table height (without mattress) atleast 685 mm or less
7	Maximum table height should be 1000 mm or more
8	Trendelenburg & reverse Trendelenburg range (in degree) 30 or more
9	Lateral tilt, left & right (in degree) 20 or more
10	Maximum patient weight - atleast 450 kg and atleast 300 kg or more for all articulation positions.
11	Should have auto leveling (0° positioning) i.e., bringing back table to normal position from any position by one touch of button on the remote. Also the remote should have the facility for self-compensating floor locking device with four self-adjusting post for uneven floors.
12	Table top sliding both head and leg side, flex & reflex should be achievable by single press of the button on the remote control.
13	Should have mattress made up of special foam to support the patient and prevent pressure sores and should be antistatic.
14	Base cover and cylinder cover should be made of Stainless steel 304 Grade.
15	100% kidney position should be obtained without moving the patient, through remote Control by using extension/ break function.
16	Cranial and Caudal traverse atleast 350 mm or more.
17	Head section adjustment $\pm 60$ degree and should be detachable.
18	Foot section adjustment 90 to 0 degree and should be detachable.
19	Table top should be of water proof and disinfectant proof and highly durable.
20	Battery backup should be of minimum 5 hours or minimum 50 nos. of operations.
21	The table base must be equipped with four castors with 360 deg rotation for easy and smooth maneuvering and mobility in all directions. (Manual movement to move the OT table).

Dr. Swagat Mahapatra  
Professor (Jr. Gr.)  
Dept. of Orthopaedics  
Dr. RMLIMS, Lucknow

Dr. Vinjet Kumar  
Professor (Junior Grade)  
Dept. of Orthopaedics  
Dr. RMLIMS, Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

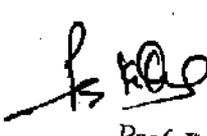
Dr. Narendra Singh Kushwaha  
Professor  
Department of Orthopaedic Surgery  
King George's Medical University  
Lucknow

Head of Deptt. Ortho.  
S.N Medical College, Agra

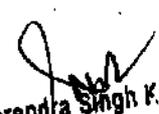
22	<b>Scope of Supply</b>
	<b>Orthopedic extension device should have</b>
a	Carbon fiber Extension Main Frame
b	Lower Leg Support
c	Knee Support
d	Traction Device
e	Accessory Fixture
f	Extension device trolley
g	Pelvis support
h	Traction Boots
i	Extension clamp
j	Fixture rail extension for leg crutch
k	Counter traction post for femur
l	Lateral Support with Lock - 1 Pair
m	Leg Crutches with Clamp - 1 Pair
n	Anesthesia Screen Frame with Clamp - 1 No.
o	Restraint Strap - 1 No
p	Back Buttock Support with Lock - 1 No
q	Pubic Sacrum Support with Lock - 1 No
r	Microscopic Operating Frame - 1 No
s	Raised Arm Rest - 1 No
t	Shoulder Surgery Attachment - 1 No
u	Meniscus Positioning Device - 1 No
v	Condyle Fixation for Tibia and Fibula - 1 No
w	Patient Transfer Device - 1 No
x	Shoulder Support with Lock - 1 Pair
23	<b>Certifications</b>
a	System should be US FDA registered and European CE certified and certificate to be submitted.
b	Shall meet internationally recognised standard for Electro Magnetic Compatibility (EMC) for electromedical equipment: IEC 60601-1-2: latest edition or should comply with 89/366/EEC; EMC-derective as amended. IEC test reports from to be submitted.
c	Certified to be compliant with IEC 60601-2-46; Particular requirements for the safety of operating Tables: latest edition. IEC test reports to be submitted.

  
Dr. Swagat Mahapatra  
Professor (Jr. Gr.)  
Deptt. of Orthopaedics,  
Dr. RMLIMS, Lucknow

  
Dr. Vineet Kumar  
Professor (Junior Grade)  
Deptt. of Orthopaedics  
Dr. RMLIMS, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

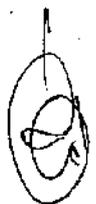
  
Dr. Narender Singh Kushwaha  
Head of Deptt. Ortho.  
S.N Medical College, Agra

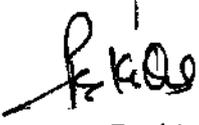
  
Dr. Narender Singh Kushwaha  
Professor  
Department of Orthopaedic Surgery  
King George's Medical University U.P.  
Lucknow

## Pelvic Instruments Set

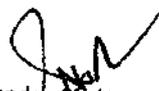
S.No	Description	Qty
1	Pelvic C Clamp	1
2	Nail For Pelvic C Clamp , Cannulated , short L 190mm	1
3	Nail For Pelvic C Clamp , Cannulated , long L 210mm	1
4	Offset Clamp, Tips Offset 4.5mm	1
5	Ratchet Wrench for Nut , hexagonal 11mm	1
6	Socket Wrench 11mm with hammer	1
7	Wire Cutter , Large , with multiplication , L 220mm	1
8	Guide handle for Kirschen Wire 2.5mm	1
9	Inner Rail for Pelvic C Clamp	1
10	Outer Rail for Pelvic C Clamp	1
11	Upper Side Arm for Pelvic C Clamp	1
12	Lower Side Arm for Pelvic C Clamp	1
14	Pelvic Reduction Forceps 280 mm	2
15	Angled Pelvic Reduction Forcep 250mm	2
16	Angled Pelvic Reduction Forcep 280mm	2
17	Pelvic Reduction Forceps Medium 250 mm	2
18	Pelvic Reduction Forceps 200 mm	2
19	Plate Bender	2
20	Drill Guider 2.5mm for Flexible Drill Bit	1
21	Pelvic Reduction Forcep Large 330mm	2
22	Straight Ball Spike 300mm	1
23	Tap Cortex 3.5	1
24	Flexible Drill Bit 2.5	1
25	Universal Screwdriver hexagonal 2.5mm	1
26	Pelvic Asymmetric Reduction Forcep with Spiked disc round curved/flat	2
27	Pelvic Reduction Forceps 400 mm	2
28	Pelvic Reduction Forcep with 3 Ball Spiked	2
29	Aluminium Box	1
	<b>Certifications</b>	
30	Should be USFDA & EU CE Approved	

  
Dr. Swagat Mahapatra  
Professor (Jr. Gr.)  
Deptt. of Orthopaedics  
Dr. RMLIMS, Lucknow

  
Dr. Vineet Kumar  
Professor (Junior Grade)  
Deptt. of Orthopaedics  
Dr. RMLIMS, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Head of Deptt. Ortho.  
S.N Medical College, Agra

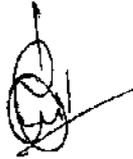
  
Dr. Narendra Singh Kushwaha  
Professor  
Department of Orthopaedic Surgery  
King George's Medical University U.P.  
Lucknow

### Plaster Cutting Equipments

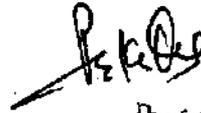
S. No.	Description	Qty
1	Plaster Saw Heavy Handle	1
2	Plaster Spreader	1
3	Bandage Cutting Scissor	1
4	Big Bowl/Bacin S.S. with stand for Plaster	1
5	Electric Plaster Cutting Saw	1



Dr. Swagat Mahapatra  
Professor (Jr. Gr.)  
Deptt. of Orthopaedics  
Dr. RMLIMS, Lucknow

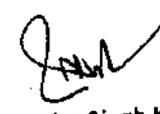


Dr. Vineet Kumar  
Professor (Junior Grade)  
Deptt. of Orthopaedics  
Dr. RMLIMS, Lucknow



Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Head of Deptt. Ortho.  
S.N Medical College, Agra

  
Dr Narender Singh Kushwaha  
Professor  
Department of Orthopaedic Surgery  
King George's Medical University U.P.  
Lucknow

Basic Instrument set for fracture

S. No.	Description	Qty
1	<b>Basic Instrument Set for fracture</b>	
	Diamond pointed Bone Awl	1
	Small Plate bender Pair	1
2	<b>Drill Bits</b>	1
	Drill Bit - S. S. Quick coupling End Dia.2.5mmX115mm Long	1
	Drill Bit - S. S. Quick coupling End Dia.2.5mmX200mm Long	1
	Drill Bit - S. S. Quick coupling End Dia.2.7mmX125mm Long	1
	Drill Bit - S. S. Quick coupling End Dia.2.7mmX200mm Long	1
	Drill Bit - S. S. Quick coupling End Dia.3.2mmX130mm Long	1
	Drill Bit - S. S. Quick coupling End Dia. 3.2 mmX200mm Length	1
	Drill Bit - S. S. Quick coupling End Dia. 4.5mmX130mm Long	1
	Drill Bit - S. S. Quick coupling End Dia. 4.5 mmX200mm Length	1
	Cannulated Drill Bit 2.7mm/1.35mm, Length Q.C. End	1
	Cannulated Drill Bit 4.5mm	1
3	<b>Drill Taps</b>	1
	Bone Tap - Quick coupling End Dia. 3.5 mm, Thread Length 50mm, Total Length	1
	Bone Tap - Quick coupling End Dia. 4 mm, Thread Length 70mm, Total Length	1
4	<b>Periosteal Elevator</b>	1
A	<b>Straight End</b>	
	Periosteal Elevator - Straight 10mm	1
	Periosteal Elevator - Straight 20mm	1
B	<b>Curved End</b>	
	Periosteal Elevator - Curved 10mm	1
	Periosteal Elevator - Curved 20mm	1
C	<b>Chisels with Fiber Handle</b>	
	Chisel with Fibre Handle size - 10mm	1
	Chisel with Fibre Handle Size - 25mm	1
D	<b>Osteotome with fiber handle - Straight</b>	
	Osteotome with fiber handle - Straight Size - 10mm	1
	Osteotome with fiber handle - Straight Size - 20mm	1
	Osteotome with fiber handle - Straight Size - 30mm	1
E	<b>Osteotome with fiber handle - Curved</b>	
	Osteotome with fiber handle - Curved Size - 10mm	1
	Osteotome with fiber handle - Curved Size - 20mm	1
	Osteotome with fiber handle - Curved Size - 30mm	1
F	<b>Gouge with fiber handle - Straight</b>	
	Gouge with fiber handle - Straight Size - 10mm	1
	Gouge with fiber handle - Straight Size - 20mm	1
G	<b>Gouge with fiber handle - Curved</b>	
	Gouge with fiber handle - Curved Size - 10mm	1
	Gouge with fiber handle - Curved Size - 20mm	1
H	<b>Amputation Saw</b>	
	Finger Saw	1
I	<b>Bruns Bone Currette With Fiber Handle</b>	
	Bruns Bone Currette With Fiber Handle Size - 10mm	1
	Bone Currette Double Ended 9mmX12mm	1
J	<b>Forceps</b>	
	Burn Bone Holding Forceps	1
	Bone Holding Forceps Small	1
	Bone Holding Forceps medium	1

Dr. Swagat Mahapatra  
Professor (Jr. Gr.)  
Deptt. of Orthopaedics  
Dr. RMLIMS, Lucknow

Dr. Vinet Kumar  
Professor (Junior Grade)  
Deptt. of Orthopaedics  
Dr. RMLIMS, Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Head of Deptt. Ortho.  
S.N Medical College, Agra

Dr. Narendra Singh Kushwaha  
Professor  
Department of Orthopaedic Surgery  
King George's Medical University U.P.  
Lucknow

	Bone Holding Forceps Large	1
	Pelvic Reduction Forceps, Oblique, Small Length - 190mm with Pointed Ball Tips, Speed Lock	1
	Pelvic Reduction Forceps, Oblique, Small Length - 240mm with Pointed Ball Tips, Speed Lock	1
	Lane's Bone Holding Forcep With Ratchet	1
<b>K</b>	<b>Bone Cutting Forceps</b>	
	Bone Nibbler - Straight (Double Action) 190mm	1
	Bone Nibbler - Curved (Double Action) 190mm	1
	Bone Nibbler - Angular (Double Action) 225mm	1
	Tuder Edward Bone Cutting Forceps	1
<b>L</b>	<b>Hooks</b>	
	Bone Hook - Small	1
	Bone Hook - Large	1
<b>M</b>	<b>Impactors</b>	
	Impactor - Nylon Faced Large	1
	Lane Bone Lever - Plain - Small	1
	Lane Bone Lever - Serrated	1
	Lane Bone Lever - Plain - Large	1
<b>N</b>	<b>Pliers</b>	
	Plier cum Wire bender cum wire cutter - 11"	1
	Flat Nose Plier	1
<b>O</b>	<b>Remers</b>	
	K.Nail Reamer Dia. 6mm	1
	K.Nail Reamer Dia. 7mm	1
	K.Nail Reamer Dia. 8mm	1
	K.Nail Reamer Dia. 9mm	1
	K.Nail Reamer Dia. 10mm	1
	K.Nail Reamer Dia. 11mm	1
	K.Nail Reamer Dia. 12mm	1
<b>P</b>	<b>Remers (Cannulated) Rigid for Nailing</b>	
	Cannulated Rigid Reamers Dia 7.0mm	1
	Cannulated Rigid Reamers Dia 8.0mm	1
	Cannulated Rigid Reamers Dia 9.0mm	1
	Cannulated Rigid Reamers Dia 10.0mm	1
	Cannulated Rigid Reamers Dia 11.0mm	1
	Cannulated Rigid Reamers Dia 12.0mm	1
	Cannulated Rigid Reamers Dia 13.0mm	1
<b>Q</b>	<b>Retractors</b>	
	Lagenback Retractor- Small	1
	Lagenback Retractor- Medium	1
	Lagenback Retractor-Large	1
<b>R</b>	<b>Screw Drivers</b>	
	Small Hexagonal Screw Driver 2.5mm Tip	1
	Large Hexagonal Screw Driver 3.5mm Tip	1
	Cannulated Screw Drivers	1
	Cannulated Hexagonal Screw Driver 2.5mm Tip	1
	Large Cannulated Hexagonal Screw Driver 3.5mm Tip	1
<b>S</b>	<b>Hammer</b>	
	Bone Hammer 350gms	1
	Bone Hammer 200gms	1
<b>T</b>	<b>K. Nail Extractor with Two Hooks</b>	
	Double Hook Retceter (Small)	1
		1

Dr. Swaga Mahapatra  
Professor (Jr. Gr.)  
Dept. of Orthopaedics  
Dr. RMLIMS, Lucknow

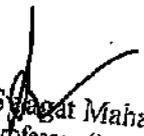
Dr. RMLIMS, Lucknow  
Professor (Junior Grade)  
Dept. of Orthopaedics  
Dr. RMLIMS, Lucknow

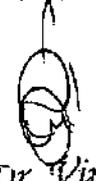
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

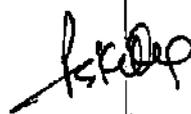
Head of Deptt. Ortho.  
S.N Medical College, Agre  
Dr. Narendra Singh Kushwaha  
Professor  
Department of Orthopaedic Surgery  
King George's Medical University U.P.  
Lucknow

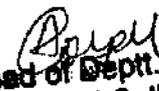
Small Cureter	1
Artery Forceps Small	1
Artery Forceps Medium	1
Artery Forceps Large	1
Dissecting Forceps (Tooth Forceps)	1
Dressing Drum Small	1
Dressing Drum Medium	1
Dressing Drum Large	1
B.P. Handle 3 Number	1
B.P. Handle 4 Number	1
Bone Gouge	1
Osteotome Medium	1
Osteotome Large	1
Wire Cutter	1
Kocke s Forceps Medium	1
Kocke s Forceps Large	1
Sponge Holding Forceps- Medium	1
Kidney Trey Small	1
Kidney Trey Medium	1
Kidney Trey Large	1
Niddle Holder Small	1
Niddle Holder Medium	1
Niddle Holder Large	1
Trey Small	1
Trey Medium	1
Trey Large	1
Bone Holding Small	1
Bone Holding Medium	1
Bone Holding Large	1
T-Handle with Jacobs check	1
Lagen back Retractor	1
Czerny s Retractor	1
Curved Dissecting Seissors Small	1
Curved Dissecting Seissors Medium	1
Curved Dissecting Seissors Large	1
Bone Punch	1
Wire Twister	1

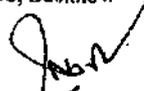
Certification Required : ISO/CE/USFDA Certified.

  
Dr. S. Jagat Mahapatra  
Professor (Jr. Gr.)  
Dept. of Orthopaedics  
Dr. RMLIMS, Lucknow

  
Dr. Vineet Kumar  
Professor (Junior Grade)  
Dept. of Orthopaedics  
Dr. RMLIMS, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

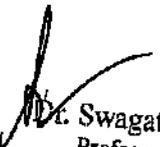
  
Head of Dept. Ortho.  
S.N Medical College, Agra

  
Dr Narendra Singh Kushwaha  
Professor  
Department of Orthopaedic Surgery  
King George's Medical University U.P.  
Lucknow

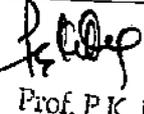
## Micro Spine General Instruments for Spine Surgeries with Vertebral Body Distractor

	Item Title	Item Specificaiton /Description	Qty
1	Bayoneted Kerrison- 40 degree	The Kerrison should be <ul style="list-style-type: none"> <li>• Should have Auto eject Mechanism.</li> <li>• Should be Bayoneted</li> <li>• Antiglare Coating Black/ Gray in color</li> <li>• Compatible for Minimal Invasive spine surgeries</li> <li>• Should have Angulation 40 Degree and bite size               <ul style="list-style-type: none"> <li>○ 1mm</li> <li>○ 2mm</li> <li>○ 3mm</li> <li>○ 4mm</li> </ul> </li> </ul>	1 set
2	Bayoneted Kerrison- 90 degree	The Kerrison should be <ul style="list-style-type: none"> <li>• Should have Auto eject Mechanism.</li> <li>• Should be Bayoneted</li> <li>• Antiglare Coating Black/ Gray in color</li> <li>• Compatible for Minimal Invasive spine surgeries</li> <li>• Should have Angulation 90 Degree and bite size               <ul style="list-style-type: none"> <li>○ 1mm</li> <li>○ 2mm</li> <li>○ 3mm</li> <li>○ 4mm</li> </ul> </li> </ul>	1 set
3	Suctions for spine Surgeries	<ul style="list-style-type: none"> <li>• Should be made of Industrial Grade Solid SS</li> <li>• Bevelled tip for increase safety</li> <li>• Should be off the following sizes               <ul style="list-style-type: none"> <li>○ 10fr</li> <li>○ 12fr</li> <li>○ Suction retractor</li> <li>○ Wide suction retractor</li> </ul> </li> </ul>	1 Set

  
 Dr Narentha Singh Kushwaha  
 Professor  
 Department of Orthopaedic Surgery  
 King George's Medical University U.P.  
 Lucknow

  
 Dr. Swagat Mahapatra  
 Professor (Jr. Gr.)  
 Deptt. of Orthopaedics  
 Dr. RMLIMS, Lucknow

  
 Dr. Dineet Kumar  
 Professor (Junior Grade)  
 Deptt. of Orthopaedics  
 Dr. RMLIMS, Lucknow

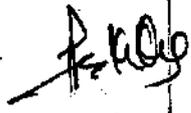
  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anesthesiology & CCM  
 Dr. RMLIMS, Lucknow

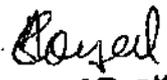
  
 Head of Deptt. Ortho.  
 S.N Medical College, Agra

4	<b>Micro Scissors</b>	<ul style="list-style-type: none"> <li>• Antiglare Coating Black/ Gray in color</li> <li>• Should be             <ul style="list-style-type: none"> <li>○ Straight</li> <li>○ Curved</li> </ul> </li> </ul>	1 set
5	<b>Micro Pituitary</b>	<ul style="list-style-type: none"> <li>• Antiglare Coating Black/ Gray in color</li> <li>• Should have the following sizes             <ul style="list-style-type: none"> <li>▪ 2mm micro-with serrated tooth</li> <li>▪ 2mm up biting micro-with serrated tooth</li> <li>▪ 2mm with tooth</li> <li>▪ 2mm up biting 45deg angulation</li> <li>▪ 2mm down biting 45deg angulation</li> <li>▪ 4mm up biting</li> <li>▪ 4mm straight biting ring handle</li> <li>▪ 4mm up biting Rongeur Design</li> </ul> </li> </ul>	1 Set
6	<b>Probes</b>	<ul style="list-style-type: none"> <li>• Antiglare Coating Black/ Gray in color</li> <li>• 90 degree short and long</li> <li>• Should have the following Bayoneted probes             <ul style="list-style-type: none"> <li>○ Woodson probe</li> <li>○ Short ball probe-right</li> <li>○ Short ball probe-Straight</li> <li>○ Short ball probe-Left</li> <li>○ Long ball probe-Right</li> <li>○ Long ball probe-Straight</li> <li>○ Long ball probe-Left</li> </ul> </li> </ul>	1 set

  
**Dr. Swagat Mahapatra**  
 Professor (Jr. Gr.)  
 Deptt. of Orthopaedics  
 Dr. RMLIMS, Lucknow

  
**Dr. Vineet Kumar**  
 Professor (Junior Grade)  
 Deptt. of Orthopaedics  
 Dr. RMLIMS, Lucknow

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
**Head of Deptt. Ortho.**  
**S.N Medical College, Agra**

  
**Dr. Narendra Singh Kushwaha**  
 Professor  
 Department of Orthopaedic Surgery  
 King George's Medical University U.P.  
 Lucknow

7	<b>Bayoneted Curettes</b>	<ul style="list-style-type: none"> <li>• Antiglare Coating Black/ Gray in color</li> <li>• Should have the following Bayoneted Curette with Black and Grey Color Coding             <ul style="list-style-type: none"> <li>○ 1.8 mm Curette- Forward Straight Cup</li> <li>○ 1.8 mm Curette-Forward Angled Cup</li> <li>○ 1.8 mm Curette-Reverse Angled Cup</li> <li>○ 3.6 mm Curette- Forward Straight Cup</li> <li>○ 3.6 mm Curette-Forward Angled Cup</li> <li>○ 3.6 mm Curette-Reverse Angled Cup</li> <li>○ 5.2 mm Curette- Forward Straight Cup</li> <li>○ 5.2 mm Curette-Forward Angled Cup</li> <li>○ 5.2 mm Curette-Reverse Angled Cup</li> </ul> </li> </ul>	1 set
8	<b>Penfield- Dual Sided</b>	<ul style="list-style-type: none"> <li>• Antiglare Coating Black/ Gray in color</li> <li>• Should have the following Bayoneted Penfields             <ul style="list-style-type: none"> <li>○ #2 push/pull</li> <li>○ #4 push/pull</li> <li>○ #7 push/pull</li> </ul> </li> </ul>	1 set
9	<b>Nerve hooks and dissectors</b>	<ul style="list-style-type: none"> <li>• Antiglare Coating Black/ Gray in color</li> <li>• Should have the following Bayoneted Nerve Hooks             <ul style="list-style-type: none"> <li>○ Left angled</li> <li>○ Straight</li> <li>○ Right angled</li> </ul> </li> <li>• Should have the following Bayoneted Micro-Nerve Hooks             <ul style="list-style-type: none"> <li>○ Left angled</li> <li>○ Straight</li> <li>○ Right angled</li> </ul> </li> <li>• Should have the following Bayoneted Dissector             <ul style="list-style-type: none"> <li>○ Left angled</li> </ul> </li> </ul>	1 set

Dr. Narendra Singh Kushwaha  
Professor  
Department of Orthopaedic Surgery  
King George's Medical University U.P.  
Lucknow

Dr. Swagat Mahapatra  
Professor (Jr. Gr.)  
Dept. of Orthopaedics  
Dr. RMLIMS, Lucknow

Dr. Vineet Kumar  
Professor (Junior Grade)  
Dept. of Orthopaedics  
Dr. RMLIMS, Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Dr. Royal  
Head of Dept. Ortho.  
S.N Medical College, Agra

		<ul style="list-style-type: none"> <li>○ Straight</li> <li>○ Right angled</li> </ul>	
10	<b>Vertebral Body Distractor</b>	<ul style="list-style-type: none"> <li>• Eliminates the need for multiple distractors which saves time and reduces the possibility of neural damage</li> <li>• Designed for both percutaneous, mini-open, and open PLIFs and TLIFs</li> <li>• Parallel distraction from 8mm – 16mm</li> <li>• Bullet shaped distractor tip for easy insertion</li> <li>• Narrow 10mm tip capable of distracting to a height of 16mm</li> <li>• Convex shape to better match patient anatomy</li> </ul>	1 set
11	<b>Cobb elevator</b>	<ul style="list-style-type: none"> <li>• Hexagonal/ round knurled handle, light weight</li> <li>• Tip width- 19mm, length 240mm</li> <li>• Tip width 26mm, length 280mm</li> <li>• Tip width 31mm, length 280mm</li> </ul>	1 Set
12	<b>Micro Chisel</b>	<ul style="list-style-type: none"> <li>• Straight, tip width 6mm, length 240mm</li> <li>• Curved, tip 6mm, length 240mm</li> </ul>	1 Set
13	<b>Gelpi retractor</b>	<ul style="list-style-type: none"> <li>• Should be deep, 90 degree angled and self retaining</li> <li>• Should have following sizes-             <ul style="list-style-type: none"> <li>• 50mm</li> <li>• 76mm</li> <li>• 101mm</li> </ul> </li> </ul>	1 Set
14	<b>Ramani retractor</b>	<ul style="list-style-type: none"> <li>• Ramani retractor set should have</li> <li>• 4 blades</li> <li>• 2 hooks</li> </ul>	1 Set

Dr. Manoj Singh Kushwaha  
 Professor  
 Department of Orthopaedic Surgery  
 King George's Medical University U.P.  
 Lucknow

Dr. Swagat Mahapatra  
 Professor (Jr. Gr.)  
 Deptt. of Orthopaedics  
 Dr. RMLIMS, Lucknow

Dr. Vineet Kumar  
 Professor (Junior Grade)  
 Deptt. of Orthopaedics  
 Dr. RMLIMS, Lucknow

Prof. P.K. Das  
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 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

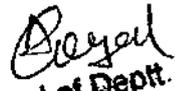
Head of Dept. Ortho.  
 S.N Medical College, Agra

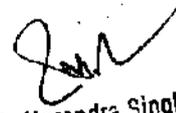
15	<b>Sterilization Cases</b>	<ul style="list-style-type: none"> <li>• <i>Should Be Provided with dedicated graphics case.</i></li> <li>• <i>Should be autoclavable</i></li> </ul>	
<ul style="list-style-type: none"> <li>• The equipment should be Bureau of Indian Standard (BIS)/ International Organization for Standardization (ISO)/CE European and USFDA</li> <li>• Instrument Should be CE certified with the four digit identification number of the Notified Body involved in the conformity assessment procedure.</li> </ul>			

  
**Dr. Swagat Mahapatra**  
 Professor (Jr. Gr.)  
 Deptt. of Orthopaedics  
 Dr. RMLIMS, Lucknow

  
**Dr. Vinod Kumar**  
 Professor (Junior Grade)  
 Deptt. of Orthopaedics  
 Dr. RMLIMS, Lucknow

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
**Dr. Jayal**  
 Head of Deptt. Ortho.  
 S.N Medical College, Agra

  
**Dr Narendra Singh Kushwaha**  
 Professor  
 Department of Orthopaedic Surgery  
 King George's Medical University U.P.  
 Lucknow

**Pain Medicine**  
**Orthopedics**  
**Neurosurgery**



Technical Specifications  
related to Pain Medicine (Anaesthesiology) by  
committee members

SR. NO.	NAME OF EQUIPMENT	GO NUMBER	APPROX. COST
1.	SPINE ENDOSCOPY- INTERLAMINAR WITH ENDOVISION AND ENERGY DEVICES	GO-I/112605/2021	1.7 Crore
2.	TRANSFORMINAL SPINE ENDOCOPY WITH ENDOVISION AND ENERGY DEVICES	GO-I/112605/2021	1.7 Crore

This is to certify that technical specification of all the above-mentioned machine/instruments, approved by the technical committee is not of any specific company. The technical features of the equipment/instruments from all reputed firms in the current market have been included in this specification to the best of my knowledge and belief & in the opinion of the technical committee.

The technical specification duly signed by the technical committee members is attached herewith.

  
Prof. Anurag Agarwal  
Professor  
Department of Anesthesiology &  
CCM  
DR RMLIMS, Lucknow

  
Prof. P.K. Das  
Chairman  
Technical specifications committee  
Clinical Subjects & others  
Head, Department of Anesthesiology & CCM  
DR RMLIMS, Lucknow

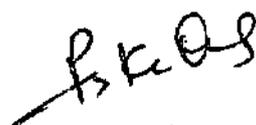
**SPINE ENDOSCOPY- INTERLAMINAR WITH ENDOVISION AND ENERGY DEVICES****For Pain Medicine (Anaesthesiology)****TECHNICAL SPECIFICATION OF ROD-LENS ENDOSCOPE**

- IT SHOULD HAVE ANGLE OF VIEW 25- 30 DEGREE, OUTER DIA 8.0 – 8.5 MM, WORKING CHANNEL 5.5 MM – 6.0 MM LENGTH 120 – 125 MM – 01 NO.
- IT SHOULD HAVE NITINOL GUIDING WIRE, COMPATIBLE WITH 18 G NEEDLE OUTER DIA 0.8 – 1.0 MM LENGTH 40 – 45 CM – 02 NOS.
- IT SHOULD HAVE 2 CHANNEL DILATOR FOR ABOVE TELESCOPE- 1
- IT SHOULD HAVE ELEVATED TIP WORKING TUBE FOR ABOVE TELESCOPE -1
- IT SHOULD HAVE FLAT WORKING TUBE FOR ABOVE TELESCOPE -1
- IT SHOULD HAVE MALLET WITH ONE SIDE RUBBER – 01 NO.
- IT SHOULD HAVE HOOK PROBE DIA 2.5 – 2.8 MM, LENGTH 305 – 310 MM – 01 NO.
- IT SHOULD HAVE CUP FORCEPS, OVERLOAD PROTECTION WITH IRRIGATION STRAIGHT JAW DIA 2.5-3.5 MM, LENGTH 260 – 265 MM – 01 NO.
- IT SHOULD HAVE SEMI - FLEXIBLE GRASPER, OVERLOAD PROTECTION WITH IRRIGATION, UPWARD JAW DIA 2.5-3.5 MM, LENGTH 260 – 265 MM – 01 NO.
- IT SHOULD HAVE SCISSORS PUNCH, OVERLOAD PROTECTION AND IRRIGATION UPWARD ANGLED JAW, DIA 2.5-3.5 MM, LENGTH 260 – 265 MM – 01 NO.
- IT SHOULD HAVE ENDOSCOPIC KERRISON ANGLED, DIA 3.5 MM, LENGTH: 260 – 265 MM, CERAMIC COATING – 02 NOS. (45 AND 90 DEGREE)
- IT SHOULD HAVE ENDOSCOPIC KERRISON HANDLE – 02 NOS.

**2. 4K CAMERA SYSTEM**

- IT SHOULD BE A FULL 4K ULTRA HIGH DEFINATION CAMERA CONTROL UNIT WITH RESOLUTION OF 3840 X 2160 PIXELS OR MORE.
- IT SHOULD HAVE USER FRIENDLY TOUCH SCREEN DISPLAY.
- IT SHOULD HAVE USER FRIENDLY PRE PROGRAMMED USER SETTINGS.
- IT SHOULD HAVE DIGITAL ZOOM
- IT SHOULD HAVE BRIGHTNESS CONTROL THROUGH AUTOMATIC SHUTTER REGULATION AND AUTOMATIC GAIN CONTROL FACILITY.
- IT SHOULD HAVE FACILITY TO INPUT THE PATIENT DATA USING USB KEYBOARD.
- IT SHOULD HAVE FACILITY TO STORE THE HIGH RESOLUTION IMAGES AND HIGH DEFINATION VIDEOS ON USB STORAGE.
- IT SHOULD HAVE DIFFERENT OUTPUT HDMI/DVI AND 3G-SDI.
- IT SHOULD HAVE 4K 3CCD/3 CMOS CAMERA HEAD PROVIDING 4 K RESOLUTIONS.

  
 Dr. Anurag Agrawal  
 Professor  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Gami Nagar, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

- THE LENGTH OF CABLE OF CAMERA HEAD IS NOT MORE THAN 3 METER.
- IT SHOULD HAVE ASPECT RATIO OF 16:9.
- IT SHOULD HAVE UNIVERSAL C-MOUNT CONNECTOR WITH OPTICAL ZOOM.
- THE CAMERA HEAD SHOULD HAVE ATLEAST 2 OR MORE PROGRAMMABLE CAMERA HEAD BUTTONS.
- THE CAMERA HEAD SHOULD BE AUTOCLAVABLE.
- IT SHOULD HAVE ZOOM LENS WITH FOCAL LENGTH OF 13-29 MM

### 3. LIGHT SOURCE (XENON/ LED)

- IT SHOULD BE A HIGH POWER LED/ XENON LIGHT SOURCE WITH COLOR TEMPERATURE OF 6500 KELVIN OR MORE.
- IT SHOULD HAVE LIGHT CABLE IDENTIFICATION STANDBY, IF THE LIGHT CABLE IS REMOVED.
- IT SHOULD HAVE A LIFE TIME OF AT LEAST 30,000 HOURS.IT SHOULD BE A MAINTENANCE FREE EQUIPMENT.
- FIBER LIGHT CABLE FOR THE ABOVE LIGHT SOURCE - 02 NOS

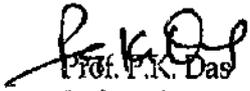
### 4. 4K MONITOR

- 4K MEDICAL GRADE MONITOR MIN. 45"-55" INCHES; ULTRA HIGH DEFINATION RESOLUTION 3840 X 2160 PIXELS.
- IT SHOULD HAVE ASPECT RATIO OF 16:9.
- IT SHOULD HAVE PICTURE IN PICTURE DISPLAY FORMAT.
- IT SHOULD HAVE VARIOUS INPUT AND OUTPUT TERMINALS

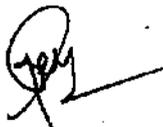
### 5. RADIOFREQUENCY ABLATION CAUTERY SYSTEM

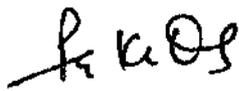
- IT SHOULD BE DESIGNED FOR CUTTING, ABLATION, VAPORIZATION, COAGULATION OF SOFT TISSUES, HEMOSTASIS OF BLOOD VESSELS AND SUCTION CAPABILITIES IN ONE VERSATILE SINGLE USE DEVICE WITH EQUAL TO OR MORE THAN 4MHZ FREQUENCY.
- IT SHOULD WORK IN NORMAL SALINE SOLUTION TO GENERATE PLASMA ENERGY.
- IT SHOULD BE A MULTIFUNCTIONAL MACHINE FOR BOTH SPINE ENDOSCOPY AND ARTHROSCOPIC SPORTS MEDICINE SURGERIES.
- IT SHOULD HAVE MEMORY FUNCTION TO REMEMBER THE LAST SELECTED POWER SETTING.
- IT SHOULD HAVE PUSH BUTTON CONTROL, LED DIGITAL DISPLAY & WATER PROOF PANEL.
- IT SHOULD HAVE PRECISE OPERATION (ABLATION WORKS AT THE TARGETED TISSUE SURFACE).
- IT SHOULD BE ABLE TO AVOID UNEXPECTED NERVE DAMAGE.

  
 Dr. Anurag Agrawal  
 Professor  
 Dept. of Anaesthesiology & CCM  
 Dr. PRLIMS, Gomti Nagar, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

- IT SHOULD HAVE IMPEDANCE DETECTION AND AUTOMATIC ENERGY INSPECTION TECHNOLOGY, AND THERMAL DAMAGE DEPTH MONITORING SYSTEM.
  - IT SHOULD HAVE A WORKING TEMPERATURE OF 40-70 DEG.CELSIUS NO CARBONIZATION AND REDUCED DAMAGE TO SURROUNDING TISSUES.
  - IT SHOULD HAVE AUTOMATIC ACCESSORIES & ELECTRODES RECOGNITION AND OPTIMIZED OPERATING MODE SELECTION.
  - IT SHOULD HAVE DIFFERENT SOUND FOR ABLATION AND PLASMA COAG TO AVOID ACTIVATING THE WRONG FOOT CONTROL. THE SOUND VOLUME SHOULD BE ADJUSTABLE.
  - IT SHOULD HAVE TOGGLE BUTTON ON FOOT PEDAL FOR INCREASING AND DECREASING OF POWER.
  - IT SHOULD HAVE AN AUDIO ALARM FOR EVERY 5 SECONDS OF ACTIVATION TIME FOR CERTAIN ELETRODE SELECTION.
  - IT SHOULD HAVE DIFFERENT TYPES OF SURGICAL ELECTRODES WITH DIFFERENT SHAPES & ANGLES
  - IT SHOULD HAVE ELECTRODE FOR ABLATION AND COAGULATION , WITH TIP DIA OF 3.5 - 4.5 MM AND SHAFT LENGTH 130 MM - 150 MM ANGLE 90 DEGREE
  - IT SHOULD HAVE ELECTRODE FOR ABLATION AND COAGULATION WITH HOOK TIP DIA OF 3.5 - 4.5 MM AND SHAFT LENGTH 130 MM - 150 MM
  - IT SHOULD HAVE ELECTRODE FOR ABLATION AND COAGULATION , WITH TIP DIA OF 2-2.5 MM AND SHAFT LENGTH 110 MM - 130 MM
  - IT SHOULD HAVE ELECTRODE FOR ABLATION AND COAGULATION , WITH 360 DEGREE BENDABLE TIP DIA OF 3-3.5 MM AND SHAFT LENGTH 120 MM - 140 MM
  - IT SHOULD HAVE ELECTRODE FOR ABLATION AND COAGULATION WITH TIP DIA OF 4.5 - 5.5 MM AND SHAFT LENGTH 270 MM - 280 MM ANGLE 90 DEGREE .
  - IT SHOULD HAVE ELECTRODE FOR ABLATION AND COAGULATION WITH TIP DIA OF 2.5 - 3 MM AND SHAFT LENGTH 390 MM - 410 MM
  - IT SHOULD HAVE ELECTRODE FOR ABLATION AND COAGULATION WITH 360 DEGREE BENDABLE TIP DIA OF 3 - 4 MM AND SHAFT LENGTH 390 MM - 410 MM
- 6. DRILL SYSTEM:**
- IT SHOULD BE DESIGNED FOR DRILLING, GRINDING, CUTTING TREATMENT OF HUMAN BONE TISSUE AND SOFT TISSUE IN ORTHO AND SPINE ENDOSCOPY.
  - IT SHOULD HAVE LARGE SIZE HIGH DEFINITION FULL COLOR LCD TOUCH SCREEN WITH HANDLE MODEL IDENTIFICATION AND DISPLAY, SPEED DISPLAY, HANDLE OPERATION DIRECTION MODE SETTING, PUMP FLOW DISPLAY AND ADJUSTMENT.
  - SPEED SETTING, OPERATION MODE SETTING, ACTIVITY HANDLE SELECTION, PUMP START AND STOP AND FLOW ADJUSTMENT SHOULD BE OPERATED THROUGH THE SCREEN.
  - IT SHOULD HAVE BUILT-IN COOLING/FLUSHING PUMP WITH INDEPENDENT SWITCH PROVIDES WATER INJECTION FLUSHING AND COOLING FUNCTION WITH ADJUSTABLE FLOW.

  
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 Professor (S.S.)  
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 Dr. RMLIMS, Connaught Nagar, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

- ALL MODES SHOULD BE SELECTABLE THROUGH THE SCREEN, FOOT SWITCH & HANDLE BUTTON.
- IT SHOULD HAVE SELF INSPECTION AND ERROR PROMPT FUNCTIONS, THE FAULT AUTOMATICALLY STOP WORKING AND DISPLAY THE FAULT CODE.
- IT SHOULD HAVE MULTI-FUNCTION FOOT SWITCH WITH 3 MTR LENGTH CABLE.
- IT SHOULD BE MICRO-ULTRA LIGHTWEIGHT DESIGN HANDLE, ERGONOMIC DESIGN, COMFORTABLE GRIP AND GOOD FOR LONG TIME SURGERY.
- THE HANDLE SHOULD HAS AN OVERLOAD PROTECTION FUNCTION.
- IT SHOULD HAVE TITANIUM ALLOY BODY HIGH SPEED HANDLE.
- IT SHOULD BE MICRO-ULTRA LIGHTWEIGHT DESIGN HANDLE, SLIM SHAPE FOR EASY PEN GRIP.
- IT SHOULD HAVE IMPORTED BRUSHLESS MOTOR, LARGE TORQUE, LOW NOISE WITH SMALL VIBRATION AND DURABILITY.
- IT SHOULD HAVE POSITIVE AND REVERSE MODE FREE SWITCH WITH ADJUSTABLE SPEED.
- IT SHOULD HAVE MAXIMUM SPEED OF 60,000R/MIN OR MORE.
- IT SHOULD BE SUPPLIED WITH DIFFERENT SIZES OF BURR AND DIFFERENT DIAMETER
- IT SHOULD HAVE SHARPENING BURR DIA 3 MM LENGTH 110-115MM.
- IT SHOULD HAVE SHARPENING BURR DIA 5 MM LENGTH 110-115MM.
- IT SHOULD HAVE CARBORUNDUM BURR DIA 3 MM LENGTH 110-115MM.
- IT SHOULD HAVE CARBORUNDUM BURR DIA 4 MM LENGTH 110-115MM.
- IT SHOULD HAVE SHEATHE CARBORUNDUM BURR DIA 4MM LENGTH 110-115MM.
- IT SHOULD HAVE SHEATHE WATERMELON PIECE BURR DIA 4MM LENGTH 110-115MM.
- IT SHOULD HAVE CARBORUNDUM BURR DIA 3 MM LENGTH 285 - 300 MM

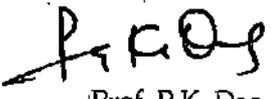
#### 7. RECORDING SYSTEM

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- IT SHOULD BE HAVE A TOUCH SCREEN SIZE OF 7 - 10 INCHES TO CONTROL FEATURES OF LIVE RECORDING OF VIDEO AND STILL IMAGES.
- IT SHOULD HAVE INTERNAL CAPACITY OF MIN. 2 TB.
- IT SHOULD HAVE MIN. 2 USB PORTS FOR RECORDING ON DISK.

#### 8. VIDEO TROLLEY OF SAME OEM

- IT SHOULD HAVE MINIMUM 3-5 SHELVES.

  
 Dr. Anurag Agrawal  
 Professor  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Gazi Begon, Lucknow

  
 Prof. P.K. Das  
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 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

- IT SHOULD HAVE 4 CASTOR WHEELS.
- IT SHOULD HAVE IN BUILT VOLTAGE TRANSFORMER.
- IT SHOULD HAVE SEPARATE ADJUSTABLE ARM FOR 4K 32 INCHES MONITOR.
- IT SHOULD BE SUPPLIED WITH ALL NECESSARY CABLES TO ACCOMMODATE THE COMPLETE SYSTEM

**9. POWER BACKUP**

- SKVA UPS WITH MINIMUM 30 MINUTES POWER BACK ANY REPUTED MAKE WITH BATTERY STAND

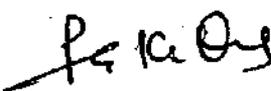
**10. CLEANING AND STORAGE**

- STERILIZATION TRAY
- CIDEX TRAY
- STORAGE ALMIRAH
- CLEANING BRUSH

ALL THE EQUIPMENTS SHOULD BE EUROPEAN CE / US FDA / BIS CERTIFIED



Dr. Anurag Agrawal  
Professor (S.C.)  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Ganti Nagar, Lucknow



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Dept. of Anaesthesiology & CCM  
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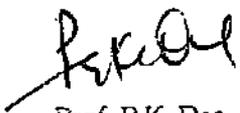
**TRANSFORMINAL SPINE ENDOSCOPY WITH ENDOVISION AND ENERGY DEVICES****For Pain Medicine (Anaesthesiology)****1. TRANSFORMINAL ENDOSCOPE**

- IT SHOULD HAVE ANGLE OF VIEW 25-30 DEGREE, OUTER DIA 7.0 – 7.5 MM, WORKING CHANNEL 3.5 MM – 4.5 MM LENGTH 180 MM – 210 MM, AUTOCLAVABLE – 01 NO.
- IT SHOULD HAVE NITINOL GUIDING WIRE, COMPATIBLE WITH 18 G NEEDLE OUTER DIA 0.8 – 1.0 MM LENGTH 40 – 45 CM – 02 NOS.
- IT SHOULD HAVE 2 CHANNEL DILATOR DIA 7.0 MM – 7.5 MM LENGTH 220 – 230 MM – 01 NO. (COMPATIBLE TO ENDOSCOPE)
- IT SHOULD HAVE BEVELED WORKING TUBE OUTER DIA 8.0 – 8.5 MM, INNER DIA 7.0 – 7.5 MM, LENGTH 175 – 180 MM – 01 NO. (COMPATIBLE TO ENDOSCOPE)
- IT SHOULD HAVE ELEVATED TIP WORKING TUBE OUTER DIA 8.0 – 8.5 MM, INNER DIA 7.0 – 7.5 MM, LENGTH 175 – 180 MM – 01 NO. (COMPATIBLE TO ENDOSCOPE)
- IT SHOULD HAVE MALLET WITH ONE SIDE RUBBER – 01 NO.
- IT SHOULD HAVE HOOK PROBE DIA 2.5 – 2.8 MM, LENGTH 305 – 310 MM – 01 NO.
- IT SHOULD HAVE CUPPED GRASPER, STRAIGHT JAW, ATRAUMATIC SERRATION, OVERLOAD PROTECTION WITH IRRIGATION, DIA 3-3.5 MM, LENGTH 325 – 330 MM – 01 NO.
- IT SHOULD HAVE SEMI - FLEXIBLE GRASPER, OVERLOAD PROTECTION WITH IRRIGATION, DOUBLE ACTION DIA 3.0-3.5 MM, LENGTH 325 – 330 MM – 01 NO.
- IT SHOULD HAVE SCISSORS PUNCH, OVERLOAD PROTECTION AND IRRIGATION STRAIGHT JAW, DIA 2.5 MM, LENGTH 325 – 330 MM – 01 NO.
- IT SHOULD HAVE ENDOSCOPIC KERRISON ANGLED, DIA 4.0 MM, LENGTH: 350 – 360 MM, CERAMIC COATING – 02 NOS.
- IT SHOULD HAVE ENDOSCOPIC KERRISON HANDLE – 02 NOS.

**2. 4K CAMERA SYSTEM**

- IT SHOULD BE A FULL 4K ULTRA HIGH DEFINATION CAMERA CONTROL UNIT WITH RESOLUTION OF 3840 X 2160 PIXELS OR MORE.
- IT SHOULD HAVE USER FRIENDLY TOUCH SCREEN DISPLAY.
- IT SHOULD HAVE USER FRIENDLY PRE PROGRAMMED USER SETTINGS.
- IT SHOULD HAVE DIGITAL ZOOM
- IT SHOULD HAVE BRIGHTNESS CONTROL THROUGH AUTOMATIC SHUTTER REGULATION AND AUTOMATIC GAIN CONTROL FACILITY.

  
 Dr. Anurag Agrawal  
 Professor (CCM)  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Gorbh Nagar, Lucknow

  
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 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

- IT SHOULD HAVE FACILITY TO INPUT THE PATIENT DATA USING USB KEYBOARD.
- IT SHOULD HAVE FACILITY TO STORE THE HIGH RESOLUTION IMAGES AND HIGH DEFINATION VIDEOS ON USB STORAGE.
- IT SHOULD HAVE DIFFERENT OUTPUT HDMI/DVI AND 3G-SDI.
- IT SHOULD HAVE 4K 3CCD/3 CMOS CAMERA HEAD PROVIDING 4 K RESOLUTIONS.
- THE LENGTH OF CABLE OF CAMERA HEAD IS NOT MORE THAN 3 METER.
- IT SHOULD HAVE ASPECT RATIO OF 16:9.
- IT SHOULD HAVE UNIVERSAL C-MOUNT CONNECTOR WITH OPTICAL ZOOM.
- THE CAMERA HEAD SHOULD HAVE ATLEAST 2 OR MORE PROGRAMMABLE CAMERA HEAD BUTTONS.
- THE CAMERA HEAD SHOULD BE AUTOCLAVABLE.
- IT SHOULD HAVE ZOOM LENS WITH FOCAL LENGTH OF 13-29 MM.

### 3. LIGHT SOURCE (XENON/ LED)

- IT SHOULD BE A HIGH POWER LED/ XENON LIGHT SOURCE WITH COLOR TEMPERATURE OF 6500 KELVIN OR MORE.
- IT SHOULD HAVE LIGHT CABLE IDENTIFICATION STANDBY, IF THE LIGHT CABLE IS REMOVED.
- IT SHOULD HAVE A LIFE TIME OF AT LEAST 30,000 HOURS. IT SHOULD BE A MAINTENANCE FREE EQUIPMENT.
- FIBER LIGHT CABLE FOR THE ABOVE LIGHT SOURCE - 02 NOS

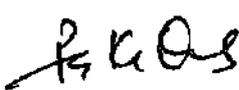
### 4. 4K MONITOR

- 4K MEDICAL GRADE MONITOR MIN. 45-55" inches; ULTRA HIGH DEFINATION RESOLUTION 3840 X 2160 PIXELS.
- IT SHOULD HAVE ASPECT RATIO OF 16:9.
- IT SHOULD HAVE PICTURE IN PICTURE DISPLAY FORMAT.
- IT SHOULD HAVE VARIOUS INPUT AND OUTPUT TERMINALS

### 5. RADIOFREQUENCY SURGICAL ABLATION SYSTEM

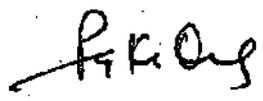
- IT SHOULD BE DESIGNED FOR CUTTING, ABLATION, VAPORIZATION, COAGULATION OF SOFT TISSUES, HEMOSTASIS OF BLOOD VESSELS AND SUCTION CAPABILITIES IN ONE VERSATILE SINGLE USE DEVICE WITH EQUAL AND MORE THAN 4 MHz FREQUENCY.
- IT SHOULD WORK IN NORMAL SALINE SOLUTION TO GENERATE PLASMA ENERGY.
- IT SHOULD BE A MULTIFUNCTIONAL MACHINE FOR BOTH SPINE SURGERIES AND ARTHROSCOPIC SPORTS MEDICINE SURGERIES.

  
 Dr. Anurag Agrawal  
 Professor  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Gandhi Nagar, Lucknow

  
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 Professor & Head  
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 Dr. RMLIMS, Lucknow

- IT SHOULD HAVE MEMORY FUNCTION TO REMEMBER THE LAST SELECTED POWER SETTING.
  - IT SHOULD HAVE PUSH BUTTON CONTROL, LED DIGITAL DISPLAY & WATER PROOF PANEL.
  - IT SHOULD HAVE PRECISE OPERATION (ABLATION WORKS AT THE TARGETED TISSUE SURFACE).
  - IT SHOULD BE ABLE TO AVOID UNEXPECTED NERVE DAMAGE.
  - IT SHOULD HAVE IMPEDANCE DETECTION AND AUTOMATIC ENERGY INSPECTION TECHNOLOGY, AND THERMAL DAMAGE DEPTH MONITORING SYSTEM.
  - IT SHOULD HAVE A WORKING TEMPERATURE OF 40-70 DEG.CELSIUS NO CARBONIZATION AND REDUCED DAMAGE TO SURROUNDING TISSUES.
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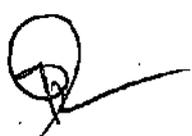
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- IT SHOULD BE SUPPLIED WITH DIFFERENT SIZES OF BURR AND DIFFERENT DIAMETER
- IT SHOULD HAVE SHARPENING BURR DIA 3 MM LENGTH 200 MM – 230 MM.
- IT SHOULD HAVE SHARPENING BURR DIA 5 MM LENGTH 200 MM – 230 MM.
- IT SHOULD HAVE CARBORUNDUM BURR DIA 3 MM LENGTH 200 MM – 230 MM.
- IT SHOULD HAVE CARBORUNDUM BURR DIA 4 MM LENGTH 200 MM – 230 MM.
- IT SHOULD HAVE SHEATHE CARBORUNDUM BURR DIA 4MM LENGTH 200 MM – 230 MM.
- IT SHOULD HAVE MAXIMUM SPEED OF 60,000- 80000 RPM MOTOR
- IT SHOULD HAVE SHEATHE WATERMELON PIECE BURR DIA 4MM LENGTH 110-115MM.
- IT SHOULD HAVE CARBORUNDUM BURR DIA 3 MM LENGTH 200 MM – 230 MM

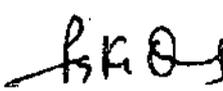
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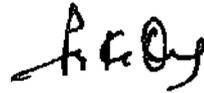
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Professor (MCh)  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Gomti Nagar, Lucknow



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Dept. of Anaesthesiology & CCM  
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# **Pediatric Surgery**



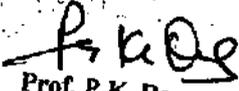
...care about Technical Specifications  
related to Department of Paediatric Surgery by  
committee members

SR. NO.	NAME OF EQUIPMENT	GO NUMBER	APPROX. COST
1.	Open Paediatric Surgical Instrument	GO-06-Mar-18 Suchi-3	50 LACS
2.	Neonatal Cystoscope ( One Set)	GO-23-Aug-18 Suchi-4	50 LACS
3.	Paediatric laparoscopy Set including HD Monitor, Triple chip Camera with recording system and Light source	GO-7-Dec-2022 GO-7-Dec-2022	50 LACS

This is to certify that technical specification of all the above-mentioned machine/instruments, approved by the technical committee is not of any specific company. The technical features of the equipment/instruments from all reputed firms in the current market have been included in this specification to the best of my knowledge and belief & in the opinion of the technical committee.

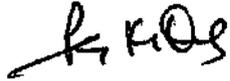
The technical specification duly signed by the technical committee members is attached herewith.

  
Dr. Srikesh Singh  
Department of Paediatric Surgery  
Professor (JG)  
DR RMLIMS, Lucknow.

  
Prof. P.K. Das  
Chairman  
Technical specifications committee  
Clinical Subjects & others  
Head, Department of Anesthesiology & CCM  
DR RMLIMS, Lucknow

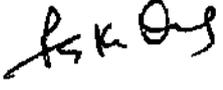
## Open Paediatric Surgical Instrument

1. Mixer Right Angle Forceps 5" - 4
  - a. Stainless Steel Design
  - b. Non corrosive
  - c. Length - 5 in
  - d. With Lock
2. Mixer Right Angle Forceps 7" - 4
  - a. Stainless Steel Design
  - b. Non corrosive
  - c. Length - 7 In
  - d. With Lock
3. Burford- Finochietto Rib Spreader - 2
  - a. Small Size for Neonates/Baby
  - b. Stainless Steel
  - c. Non Corrosive
  - d. Blades Max - 30x45mm
  - e. Max Spread - 140mm
  - f. Depth - 110mm Deep
4. Burford- Finochietto Rib Spreader - 1
  - a. Medium Size for Children
  - b. Stainless Steel
  - c. Non Corrosive
  - d. Blades Max - 150mmx 175mm
  - e. Max Spread - 250mm
5. Pediatric Needle Holder - 2
  - a. Stainless Steel Design
  - b. Non corrosive
  - c. Round, spring type, with ratchet
  - d. 12 cms size
6. Pediatric Needle Holder - 2
  - a. Stainless Steel Design
  - b. Non corrosive

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

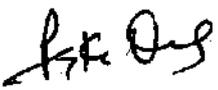
  
 डा० श्रीकृष्ण सिंह  
 आचार्य (जू० ग्रेड)  
 राज्य स्वास्थ्य विनिर्देश विभाग  
 इन्फोर्मेशन-आंस. लखनऊ  
 ओ०पी०डी- बंगलवार / गुलवार

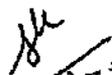
- c. Round, spring type, with ratchet  
 d. 14 cms size
7. Pediatric Needle Holder - 2  
 a. Stainless Steel Design  
 b. Non corrosive  
 c. Ring Handle Type Design  
 d. Size - 12 cms
8. Pediatric Needle Holder - 2  
 a. Stainless Steel Design  
 b. Non corrosive  
 c. Ring Handle Type Design  
 d. Size - 14 cms
9. Pediatric Needle Holder - 2  
 a. Stainless Steel Design  
 b. Non corrosive  
 c. Ring Handle Type Design  
 d. Size - 18 cms
10. Adson thumb Forceps - 4  
 a. Stainless Steel Design  
 b. Non corrosive  
 c. Tip Size - 1mm
11. Adson thumb Forceps - 4  
 a. Stainless Steel Design  
 b. Non corrosive  
 c. Tip Size - 2 mm
12. Microsurgery Needle Holder - 2  
 a. Round Handles  
 b. Stainless Steel  
 c. With Lock  
 d. Curved Tip  
 e. Length - 7 In
13. Microsurgery Needle Holder - 1

  
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 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 डा० श्रीकृष्ण सिंह  
 आचार्य (जू० प्र०)  
 राज्य स्वास्थ्य विज्ञान विभाग  
 डॉ०श्रीमती०आ०स०, लखनऊ  
 ओ०पी०डी०- मंगलवार / गुरुवार

- a. Round Handles
  - b. Stainless Steel
  - c. Without Lock
  - d. Straight Tip
  - e. Length - 7 In
14. Micro Dissecting Scissor - 2
- a. Round Handles
  - b. Stainless Steel
  - c. Straight Tip
  - d. Length - 6 In
15. Mayo Scissor Curved - 4
- a. Stainless Steel Design
  - b. Curved tip
  - c. Ring Handle Type Design
  - d. Length - 4 In
16. Mayo Scissor Curved - 2
- a. Stainless Steel Design
  - b. Curved tip
  - c. Ring Handle Type Design
  - d. Length - 5 In
17. Mayo Scissor Curved - 2
- a. Stainless Steel Design
  - b. Curved tip
  - c. Ring Handle Type Design
  - d. Length - 6 In
18. Halsted Mosquito Forceps - 18
- a. Curved tip
  - b. Ring Handle Type Design
  - c. Length - 4 In
19. Artery Forceps straight 6"-6
20. Artery curved Forceps curved 6"-6
21. Artery Forceps straight 8"- 6

  
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 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
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 राज्य राज्य चिकित्सा विभाग  
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22. Artery Forceps curved 10"-6
23. Kocher Forceps Straight Delicate 1x2 5 1/2"- 6
24. Kocher Forceps Curved Delicate 1x2 5 1/2"- 6
25. Hegar's Dilator Set - 2
  - a. Sizes ranging from No. 3-18
  - b. Stainless Steel
  - c. Smooth Surfaces
26. Urethral Dilators (Male) Set - 2
  - a. Sizes ranging from Size 6-15
  - b. Stainless Steel
  - c. Smooth Surface
27. Perforated Tray - 2
  - a. Size 6inch x 9 Inches
  - b. Rust Proof
28. Perforated Tray - 2
  - a. Size 18"x9"
  - b. Rust Proof
29. Perforated Tray - 1
  - a. Size 12"x 9"
  - b. Rust Proof
30. Langenbeck retractor - 4
  - a. Size - 10mmx28mmx21cm
31. Jackson Retractor - 2
  - a. Size 17 cms
32. Senn Miller Retractors - 4
  - a. Size - 16 cms
33. Retractor Weitlaner Wulstein - 4
  - a. 3x3 prongs
  - b. Size - 6"
- 34 Czerny retractor 8"- 3
29. Czerny Retractor 10"-3

*P.K.D.*

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLHIS, Lucknow

*su*

डा० श्रीकेश सिंह  
आचार्य (जू० ग्रेड)  
राज्य स्वास्थ्य विज्ञान विभाग  
डा० ए० ए० लो० आ० सं०, लखनऊ  
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35. Allis Atraumatic Tissue Forceps - 10  
 a. Size 15.5 cms
36. Babcock Forceps 5 1/2- 6
37. Pylorus Separator 5 3/4- 2
38. Deaver Retractor 5/8 X 8- 3
39. Sponge Holding Forceps 8"- 2
40. Babcocks Forceps 5 1/2- 4
41. Scalpel handle No 3 - 6
42. Gilles Skin Hooks - 10  
 a. Small Size  
 b. Sharp tip  
 c. Size - 19 cms
43. Backhaus Towel Clamp 3 1/2"-6
44. Denis Browne Abdominal Retractor - 1  
 a. Frame only  
 b. For pediatric use  
 c. Size - 22-28cms x 16-20cms
45. Valve alien Blade for Denis Browne abdominal retractor - 4  
 a. 40x40 mm
46. Valve alien blade for Denis Browne abdominal retractor - 4  
 a. 30x40mm
47. Collin Vaginal Speculum - 2  
 a. For Children  
 b. Size - 55mmx10mm  
 c. Stainless Steel
48. Frazier Ventricular Needle - 2  
 a. Size - 2mm x 100mm
49. Laminectomy Punch - 2  
 a. Length - 15 cms
50. Laminectomy Punch - 2  
 a. Length - 18 cms
51. Shunt tunnelor-1

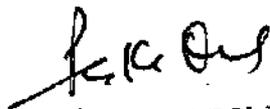
*P.K.D.*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

*SK*  
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 आचार्य (जू० ग्रेड)  
 राज्य राज्य चिकित्सा विभाग  
 डॉ० पी० सी० आर०, लखनऊ  
 को० पी० डी० - बंगलवार / गुरुवार

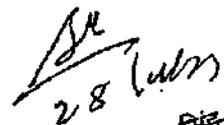
- a. Length - 20 cms
  - b. With Distal eye for threading
52. Shunt Tunneleer -1  
53. Length - 35 cm

**Certifications:**

- Instrument must be USFDA/European CE approved.



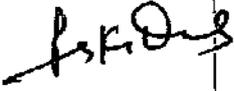
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow



डॉ० श्रीकृष्ण सिंह  
आचार्य (जू० ग्रेड)  
बाल्य शल्य चिकित्सा विभाग  
डा०एम०एल०आ०सी०, लखनऊ  
ओ०पी०डी०- मंगलवार / गुरुवार

## Neonatal Cystoscope ( One Set)

1. Telescope – for Neonatal Cystoscopy
  - a. Miniature size for Neonatal Cystoscopy
  - b. 0 degree angle of view
  - c. Length – 20 cms
  - d. Diameter – 1.2 mm
  - e. Autoclavable
  - f. Fiber optic light transmission
  
2. Cystoscope Sheath
  - a. 4.5-6 French Diameter
  - b. With Working Channel of 4 Fr
  - c. With Obturator and Luer Locks for suction Irrigation attachments
  
3. Cystoscope Sheath
  - a. 8 French Diameter
  - b. With Working channel 4 Fr for Reflux Needles
  - c. With Obturator
  
4. Injection Needle
  - a. Rigid
  - b. 3 Fr
  - c. Should be compatible with Cystoscope Sheath

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 डॉ० प्रीकेश सिंह  
 आचार्य (जू० ग्रेड)  
 बाल्य शल्य चिकित्सा विभाग  
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## 5. Hook Electrode

a. Unioplar

b. 3 Fr

## 6. Grasping Forceps

a. Double Action Jaws

b. Flexible

c. 3 Fr

d. Length - 28 cms

## 7. Knife

a. Triangular Tip

b. Unipolar

c. 3 Fr

## 8. With Telescope bridge

## 9. Pediatric Electrotome Resectoscope Sheath

a. 9 Fr

b. Connecting Tube with Luer Lock for Irrigation

c. With Compatible Working element

d. Attachment facility for Unipolar cautery

e. Cutting should be by means of spring

f. In rest Position, the electrode tip should be inside the

*P.K. Das*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCU  
 Dr. RMLHIS, Lucknow

*Dr. RMLHIS*  
 डा० श्रीकेश सिंह  
 आचार्य (जू० ग्रेड)  
 बाल्य शल्य चिकित्सा विभाग  
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 आ० पी० डी० - मंगलघाट / मुल्तवाप

sheath

10. Cutting Loop - 10

a. Angled

11. Coagulating Electrode - 10

a. Hook Shaped

b. With Ball end

12. Protection tube

a. For Sterilization and Storage of electrodes/curettes/knives

**Certifications:**

- Should be US FDA/ CE approved by 4 digits notified body.

*P.K.D.*

Prof. P.K. Das  
Professor & Head  
Dept. of Anesthesiology & CCM  
Dr. RMLIMS, Lucknow

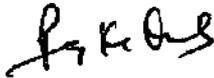
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आचार्य (जू० ग्रेड)  
पाला इत्या विकित्सा विभाग  
डा० राम लो० आर०सं. लखनऊ  
ओ०पी०डी०- मंगलवार / गुरुवार

## Pediatric laparoscopy Set including HD Monitor, Triple chip Camera with recording system and Light source

1. **High Definition Camera System**
  - Pure 1090p system – 1920 x 1080 pixels native resolution (lower resolution will not be acceptable).
  - Three Chip Camera Head with Progressive Scanning.
2. **Telescope**
  - 10mm, 30 Degree Telescope
3. **High Definition Monitor**
  - Medical Grade Flat Screen LED Monitor for use with HD System.
  - Minimum 26 inches (lower size will not be acceptable).
4. **Full High Definition Video and Image Recording System**
  - For recording of FULL High Definition videos & Images (lower quality will not be acceptable).
5. **300 W Xenon Light source with Light Cable**
  - 300 Watts Xenon Light Source.
  - 1 Nos. Thick Light Cable
6. **Endoflator.**
  - At Least 20 Liters or above Capacity (lower capacity will not be acceptable)
  - Must have digital display for all preset and real time values.
  - Must have automatic alarm and pressure control system in case of over pressure.
7. **Telescopes**
  - Telescope 5mm, 30 Degree
  - Telescope 3.5mm, 30 Degree
8. **Trocars**
  - Veress Needle, 10 cms
  - Trocar, pyramidal tip, with "automatic" flap, for 5mm instruments, length 10 cms
  - Trocar, pyramidal tip, with "automatic" flap, for 3mm instruments, length 5 cms
  - Reducer- 10mm to 5mm
  - Reduction Sleeve-5mm to 3mm
9. **Hand Instruments (3mm)**

**Laparoscopic Hand Instruments Set (3 mm, 20 cms) should have the following features:**

- Completely dismantlable 2 piece design for easy cleaning and replacibility.
  - Instrument should be easily dismantlable with a touch of a button.
  - Should be 360 degree rotatable.
  - Should be insulated with pin for unipolar connection.
1. Standard jaw Maryland dissector

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLHMS, Lucknow

  
 डॉ० अनीकेश सिंह  
 आचार्य (जू० ग्रेड)  
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2. Non tooth forceps
3. Allis Forceps-with multiple small teeth.
4. Atraumatic-Fenestrated grasping forceps-single action jaw.
5. Long Curved Jaw Atraumatic-Fenestrated grasping forceps.
6. Matzenbaum curved scissors.
7. Hook scissors.

#### Coagulation (5mm)

L-Hook, 3mm

#### Suction and Irrigation

3mm Suction Irrigation tube

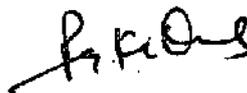
#### Suture an Ligature

Needle Holder, 3mm, Jaws curved left

All items quoted must be from a single world-class manufacturer.

#### Certifications:

- All items quoted must be FDA/CE approved with valid certificates attached.



Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

डा. प्रवीण सिंह  
आचार्य (जू० ग्रेड)  
राज्य राज्य चिकित्सा विभाग  
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ओ०पी०डी०- मंगलकर / गुरुवार

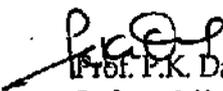
# Pediatrics

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**related to Department of Paediatrics by committee members**

SR. NO.	NAME OF EQUIPMENT	GO NUMBER	APPROX. COST
1.	ADVANCED NEONATAL/PEDIATRIC HIGH FREQUENCY OSCILLATORY (HFO) VENTILATOR	GO-28-DEC-17 SUCHI-1 GO-7-DEC-2022	42 TO 45LACS
	HIGH END NEONATAL HFO VENTILATOR		32 TO 35 LACS
	BASIC NEONATAL HFO VENTILATOR		16 TO 18 LACS
2.	MEASURING TAPE	GO-28-JAN-18 SUCHI-2 GO-23-AUG-18 SUCHI-4	
3.	OPHTHALMOSCOPE (PEDIATRIC)	GO-28-JAN-18 SUCHI-2	50,000/-
4.	HEMOGLOBIN METER (PORTABLE)	GO-28-JAN-18 SUCHI-2	
5.	THERMOMETER (DIGITAL)	GO-28-JAN-18 SUCHI-2 GO-23-AUG-18 SUCHI-4	
6.	WEIGHING MACHINE (NEONATES)	GO-28-JAN-18 SUCHI-2	
		GO-23-AUG-18 SUCHI-4	
		GO-28-JAN-18 SUCHI-2 GO-23-AUG-18 SUCHI-4	
7.	WEIGHING SCALE (CHILD)	GO-28-JAN-18 SUCHI-2	
		GO-23-AUG-18 SUCHI-4	
8.	BABY BASSINET	GO-23-AUG-18 SUCHI-4	50,000
9.	DEXTROSTIX	GO-23-AUG-18 SUCHI-4	
10.	INFANTOMETER	GO-23-AUG-18 SUCHI-4	
11.	MULTISTIX	GO-23-AUG-18 SUCHI-4	
12.	PEAK FLOW METER	GO-23-AUG-18 SUCHI-4	
13.	RECTAL THERMOMETERS	GO-23-AUG-18 SUCHI-4	
14.	URISTIX	GO-23-AUG-18 SUCHI-4	
15.	NEONATAL T PIECE RESUSCITATOR	GO-7-DEC-2022	3 LACS
16.	NEONATAL INCUBATOR	GO-28-JAN-18 SUCHI-2 GO-23-AUG-18 SUCHI-4	15 LACS
17.	TRANSPORT INCUBATOR "WITH VENTILATOR"	GO-23-AUG-18 SUCHI-4	30 LACS
	"HIGH END" SPECIFICATIONS FOR TRANSPORT INCUBATOR "WITH VENTILATOR"		25 LACS
18.	"ADVANCED" SPECIFICATIONS FOR 7 PARA NEONATAL MONITOR	GO-23-AUG-18 SUCHI-4	15 LACS
	"HIGH END" SPECIFICATION 5 PARA NEONATAL MONITOR		7 LACS
	"BASIC" SPECIFICATIONS FOR NEONATAL MONITOR		3 LACS
19.	"ADVANCED" NEONATAL/PEDIA VENTILATOR	GO-28-DEC-17 SUCHI-1 GO-7-DEC-2022	35 LACS
	"HIGH END" SPECIFICATION FOR NEONATAL/PEDIA VENTILATOR		25 LACS
	"BASIC" NEONATAL/PEDIATRIC VENTILATOR		14 LACS
20.	SINGLE SURFACE LED PHOTOTHERAPY UNIT	GO-28-JAN-18 SUCHI-2 GO-23-AUG-18 SUCHI-4	1 LACS

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. K.M. J.S. Lucknow

  
**Dr. Krishna Kumar Yadav**  
 M.D. Ph.D., FIMSA  
 Professor (Jr Grade), Pediatrics  
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Technical specifications  
related to Department of Paediatrics by committee  
members

21.	DOUBLE SURFACE LED PHOTOTHERAPY UNIT	GO-7-DEC-2022	2 LACS
22.	ADVANCED BILIRUBINOMETER	GO-23-AUG-18 SUCHI-4	10 LACS
	TRANSCUTANEOUS BILIRUBINOMETER	GO-23-AUG-18 SUCHI-4	7 LACS
23.	ADVANCED OPEN CARE WARMER WITH RESUSCITATION	GO-28-JAN-18 SUCHI-2 GO-23-AUG-18 SUCHI-4 GO-7-DEC-2022	26 LACS
	HIGH END OPEN CARE RADIANT BABY WARMER (WITH RESUSCITATION AND CPAP)		10 LACS
	BASIC OPEN CARE RADIANT WARMER		5 LACS
24.	RADIANT BABY WARMER WITH RESUSCITATION	GO-23-AUG-18 SUCHI-4	10 LACS

This is to certify that technical specification of all the above-mentioned machine/instruments, approved by the technical committee is not of any specific company. The technical features of the equipment/instruments from all reputed firms in the current market have been included in this specification to the best of my knowledge and belief & in the opinion of the technical committee.

The technical specification duly signed by the technical committee members is attached herewith.

  
Dr. K.K. Yadav  
Professor (JG)  
Department of Paediatrics  
DR RMLIMS, Lucknow

  
Prof. P.K. Das  
Chairman  
Technical specifications committee  
Clinical Subjects & others  
Head, Department of Anesthesiology & CCM  
DR RMLIMS, Lucknow

## Advanced Neonatal/ Pediatric High frequency Oscillatory (HFO) Ventilator

(Intended area of use: Tertiary Teaching NICUs)

1. Advanced microprocessor based continuous flow, pressure limited, time cycled ventilator for very low body weight infants (premature, newborns) and/or pediatrics patient. Should be suitable for patient weight of 300grams to 40kgs.
2. Technology of oscillations: Electromagnetically driven piston technology. The oscillation technology should be demonstrated on-site.
3. Dedicated HFO and conventional (gas return) expiratory ports with unique mechanism for HFO and conventional modes to ensure highest precision delivery.
4. Ventilator should have integrated device check with user prompt via screen messages leakage of patient hose system checking of valves, gas supply system, and flow sensors.
5. Should have inbuilt 15 inch TFT color touchscreen with user configurable display as below: Pressure, Flow, Volume curves as standard One or two loops on screen, User configurable graphical trends.
6. Should include oxygen therapy, non-invasive ventilation, invasive ventilation and high frequency oscillation as standard.
7. The ventilator should be supplied with heated servo-controlled humidifier of OEM or equivalent (USFDA and European CE)
8. Ventilator must have capability to be compatible with disposable universal neonatal and pediatric dual limb patient circuits (10mm/15mm) with pressure sampling line.
9. Flow sensor: The flow sensor should be of heated wire type for higher accuracy.
  - a) It should calibrate quickly within 10 seconds and data should be measured at proximal end, near the Y-piece.
  - b) It should be easily replaceable without disassembling the machine or disassembling the expiratory valve
10. The ventilator should have following standard ventilation modes as below:
  - a) A/C mode - PC, VC, VA
  - b) SIMV mode - PC, VC, VA
  - c) CPAP mode - PC, VC
  - d) Apnea Backup Ventilation with Automatic Return
  - e) APRV Mode
  - f) HFO mode with Stroke Volume.
11. Special Parameter Settings such as
  - a) Automatic Tube Compensation (ATC)
  - b) Sync+ Mode

Prof. P.K. Das  
 Professor & Head  
 Dept. of Pediatrics & ECM  
 Dr. K. S. Chackravarty

*K. K. Y.*  
 Dr. Krishna Kumar Yadav  
 MD, PhD, FIMSA  
 Professor (Jr. Grade), Pediatrics  
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12. Special procedures to be available such as: Flush FiO<sub>2</sub> Mode – 100% O<sub>2</sub> delivered during in line suction. **Should have settings for:**
- |   |  |
|---|--|
| Tidal Volume (in Volume Control/Guaranteed) | 2 to 300 ml  |
| Plateau Time                                | 0 to 2.0s  |
| Peak Inspiratory Pressure                   | 5 to 80cmH <sub>2</sub> O                            |
| PSV pressure above PEEP                     | 0 to 50cmH <sub>2</sub> O                            |
| PEEP  | 0 to 30cmH <sub>2</sub> O                            |
| Pressure trigger                            | OFF, -0.1cmH <sub>2</sub> O to -10cmH <sub>2</sub> O |
| Inspiratory Time                            | 0.1 to 3 sec   |
| Rate  | 0 to 150 bpm   |
| Inspiratory flow                            | 3 to 30 lpm  |
| IMV Base Flow                               | 3 to 20 lpm  |
| Slope control/ Rise Time                    | 0.1 to 0.9 sec                                       |
| FiO <sub>2</sub> (integrated blender)       | 21 to 100%   |
| Flow Trigger                                | OFF, 0.2 to 10 lpm                                   |
| Exhalation Trigger Sensitivity (ETS)        | 10% to 90%   |
| O <sub>2</sub> flow (nCPAP/HFNC)            | 2 to 30 lpm  |

13. Other Modes/Setting requirements:

- A. In HFOV (standard) It should be possible to combine HFOV as below :
- SI + HFOV
- B. The HFOV function should control :
- Frequency in Hz: 5 to 17 Hz.
  - Amplitude: 1 to 200 cmH<sub>2</sub>O.
  - MAP : 5 to 40 cmH<sub>2</sub>O
  - Stroke Volume : 0 to 160ml
  - SI pressure 3 to 50 cm H<sub>2</sub>O
  - SI time Off, 0.5 to 10 s
  - SI cycles 1 to 120 CPH
  - HFO base flow 10 to 30 LPM
  - It should be possible to use HFOV WITHOUT disconnecting the patient by simply switching ON/OFF in the same machine.
  - Should be able to demonstrate Active expiration up to -45cmH<sub>2</sub>O with 50ml test lung.
  - Ventilator must be demonstrated on site with 50ml test lung and 500ml/1ltr test lungs in HFOV mode.
  - Ventilator should have active dead space reduction technology like – Humidifier impedance valve to ensure efficient power delivery by minimizing dead space in patient circuit.
  - Should measure parameters in HFOV such as DCO<sub>2</sub>, VtHF (tidal volume in HFOV).
- C. APRV-Airway Pressure Release Ventilation:
- Expiratory Time / T-Low : 0.05 to 2.0 sec
  - Inspiratory Time/ T-High: 0.1 to 30 sec
  - P High : 1 to 80 cmH<sub>2</sub>O
  - P Low : 0 to 30 cmH<sub>2</sub>O
- D. Automatic Tube Compensation:
- ET diameters 2 to 8 mm
  - Tube Length 30-300mm
  - Degree of compensation OFF, 0 to 100%

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

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14. Scope of supply:
- Low compliance reusable silicone patient breathing circuit for use with MR850-2nos.
  - Should include Corrosion Free trolley
  - Disposable heated hoses with disposable chamber for use with MR850 for extremely infectious patients should be also supplied - 10 nos.
  - Servo controlled humidifier (F&P MR 850) - 1 no.
  - Heated Flow sensor - 5nos.
  - O2 cell should be cover under warranty.
  - Humidifier Impedance valve - 2nos.
  - Reusable Y-adaptor - 2nos.
  - Reusable diaphragm - 5 nos.
  - Oxygen connecting Hose - 1 no.
  - Air connecting Hose - 1 no.
  - Neonatal (50ml) and Pediatric test lung (500ml) - 1 No. each
  - Trolley mounted 2kva or higher Online UPS for battery backup of minimum 30mins- 1nos.
  - Air compressor- 1 nos.(if required)
15. The equipment should have USFDA/European CE certificate from 4 digit notified body.

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

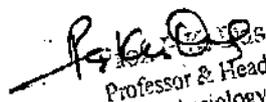
  
 Dr. Krishna Kumar Yadav  
 MD, PhD, FIMSA  
 Professor (Jr. Grade), Pediatrics  
 OPD - Wednesday

## High End Neonatal HFO Ventilator

(Intended area of use: Tertiary Teaching NICUs and referral NICUs)

The product offered must conform to the following minimum requirements:

1. Suitable for babies from 500 gm to 20 kg body weight in all conventional modes and up to 10-12 Kg in HFOV mode.
2. The ventilator head should have an inbuilt rechargeable battery back-up for a minimum of one hour, which must activate instantly upon power failure with an audio-visual alarm for power failure. The alarm must reset automatically when the power is resumed.
3. The Ventilator must operate on Time Cycled Pressure Limited principle and be a dedicated Neonatal ventilator for use in infants / pediatric patients.
4. The modes of ventilator must include: -
  - a) Intermittent Positive Pressure Ventilation (IPPV) with volume limit
  - b) SIPPV & nSIPPV
  - c) Pressure Support Ventilation (PSV)
  - d) CPAP & nCPAP
  - e) SIMV & nSIMV
  - f) nCPAP and DuoPAP (with variable flow) for non-invasive modes with leak compensation and infant flow driver circuits.
  - g) Combined SIMV(PCV)+PSV and SIMV(VCV)+PSV
  - h) Integrated HFOV
  - i) Nasal HFOV
  - j) Volume Guarantee facility during the IPPV, SIPPV, SIMV, PSV modes.
  - k) High Flow Nasal Oxygen Therapy.
5. The patient trigger must be sensitive and based on both Flow trigger and Pressure trigger. Colored/distinguished display of patient's triggers breaths.
6. The Control Setting should allow (+/- 5% tolerance)
  - a) Independent setting of inspiratory flow and Expiratory flow as:
  - b) Inspiratory Flow : 1 ~ 32 lpm
  - c) Expiratory Flow : 1 ~ 32 lpm
  - d) Inspiratory Time : 0.1 ~ 2.0 sec
  - e) Expiratory Time : 0.5 ~ 30 sec
  - f) Peak Inspiratory Pressure : 5.0 ~ 80 cmH<sub>2</sub>O
  - g) PEEP : 0 ~ 30 cmH<sub>2</sub>O
  - h) Breaths Rate : 4 ~ 150 bpm or higher
  - i) Apnea time setting : OFF, 2 ~ 20 sec
  - j) Termination Sensitivity : 5 ~ 45% adjustable by user

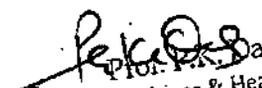
  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Dr. Krishna Kumar Yadav  
 MD, PhD, FIMSA  
 Professor (Sr. Grade), Pediatrics  
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- k) Amplitude : 5-100 cmH<sub>2</sub>O  
 l) Frequency : 5-15 HZ or better  
 m) Map : 5-30 cmH<sub>2</sub>O or better
7. User Interface Display unit through touch screen having at least 10 inch or bigger.
  8. Real time simultaneous display of 3 waveforms i.e. Flow, Pressure and Volume with automatic scaling without manual intervention.
  9. Real Time simultaneous display of 2 loops i.e. PV and FV. Overlay facility of 2 loops during surfactant therapy or similar conditions.
  10. Manual & Automatic alarm settings. Alarm should also be available for the following conditions and must get reset automatically if the alarm conditions are rectified or disappear:
    - a) Circuit Blockage
    - b) Leak %
    - c) Oxygen or Air pressure drop.
    - d) Power supply failure .
    - e) Low battery
    - f) Ventilator Intraoperative
    - g) High Pressure
  11. There must be servo-controlled humidifier.
  12. Trend storage of important data for at least 24 hours.
  13. Feature Closed Loop FiO<sub>2</sub> control based on the patient's SpO<sub>2</sub> (upgradable).
  14. Monitoring of vital parameters and must include the following:
    - a) RSBI
    - b) Resistance
    - c) Dynamic Compliance
    - d) Time Constant
  15. The scope of supply with each ventilator must include the following:
 

a) Servo Controlled Humidifier	1 Set.
b) Test Lung Neonatal	1 Pc.
c) High Pressure Hoses 3 mt. for the Oxygen and Air	1 Pc.
d) Exhalation valve diaphragm	2 Pcs
e) Reusable Proximal type flow sensors, Autoclavable*	2 Pcs
f) Patient Circuit support arm stainless steel	1 no.
g) Trolley	1 no.
h) Disposable Dual Heated limb circuits with autofill chamber	10 nos.
i) Re-usable (Autoclavable/ETO) Dual Heated limb circuits with autofill chamber	3 nos.
j) Air compressor-	1 nos.(if required)

\*Flow sensor should have warranty for 5 years. The firm has to supply it on FOC in case of failure during warranty period.

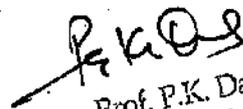
  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Dr. Krishna Kumar Yadav  
 MD, PhD, FIMSA  
 Professor (Jr. Grade), Pediatrics  
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16. Separate Prices must be quoted for the following items:

- a) Disposable Flow sensor for infected patients
- b) Disposable Dual Heated limb circuits with autofill chamber
- c) NIV accessories like head gear, nasal prongs, RAM cannula, Circuits etc.
- d) Temperature Probe for Humidifier
- e) Battery, if required after 3 years' warranty
- f) Any other disposable accessory proprietary to ventilator

17. The Ventilator should have USFDA/European CE from four digit notified body.

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

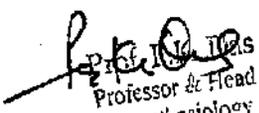
  
Dr. Krishna Kumar Yadav  
MD, PhD, FMSA  
Professor (Jr. Grade), Pediatrics  
OPD - Wednesday

## Basic Neonatal HFO Ventilator

(Intended area of use: Secondary/Tertiary NICUs)

The product offered must conform to the following minimum requirements:

1. Suitable for babies from 500 gm to 20 kg body weight (+/- 5% tolerance) in all modes.
2. The ventilator head should have an inbuilt rechargeable battery back-up for a minimum of two hours, which must activate instantly upon power failure with an audio-visual alarm for power failure. The alarm must reset automatically when the power is resumed.
3. Should be supplied with inbuilt turbine based compressor/ integrated Medical Air Compressor with OEM
4. The Ventilator must operate on Time Cycled Pressure Limited principle and be a dedicated Neonatal ventilator for use in infants / pediatric patients.
5. The modes of ventilator must include: -
  - a) Intermittent Positive Pressure Ventilation IPPV & nIPPV
  - b) SIPPV & nSIPPV
  - c) Pressure Support Ventilation (PSV)
  - d) CPAP & nCPAP
  - e) SIMV & nSIMV
  - f) nCPAP and DuoPAP (with variable flow) for non-invasive modes with leak compensation and infant flow driver circuits.
  - g) Combined SIMV(PCV)+PSV and SIMV(VCV)+PSV
  - h) Integrated HFOV
  - i) nasal HFOV
  - j) Volume Guarantee facility during the IPPV, SIPPV, SIMV, PSV.
  - k) High Flow Nasal Oxygen Therapy.
6. The patient trigger must be sensitive and based on both Flow trigger and Pressure trigger. Colored/distinguished display of patient's triggers breaths.
7. The Control Setting should allow (+/- 5% tolerance)
  - a) Independent setting of inspiratory flow and Expiratory flow as:
  - b) Inspiratory Flow : 1 ~ 32 lpm
  - c) Expiratory Flow : 1 ~ 32 lpm
  - d) Inspiratory Time : 0.1 ~ 2.0 sec
  - e) Expiratory Time : 0.5 ~ 30 sec
  - f) Peak Inspiratory Pressure : 5.0 ~ 80 cmH<sub>2</sub>O
  - g) PEEP : 0 ~ 30 cmH<sub>2</sub>O
  - h) Breaths Rate : 4 ~ 150 bpm or higher
  - i) Apnea time setting : OFF, 2 ~ 20 sec
  - j) Termination Sensitivity : 5 ~ 45% adjustable by user
  - k) Amplitude : 5-100 cmH<sub>2</sub>O
  - l) Frequency : 5-20 HZ

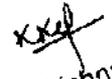
  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Dr. Kristina Kumar Yadav  
 MD, PhD, FIMSA  
 Professor (Pediatrics)  
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- m) Map : 5-50 cmH<sub>2</sub>O
8. User Interface Display unit through touch screen having at least 10 inch or bigger.
  9. Real time simultaneous display of 3 waveforms i.e. Flow, Pressure and Volume with automatic scaling without manual intervention.
  10. Real Time simultaneous display of 2 loops i.e. PV and FV. Overlay facility of 2 loops during surfactant therapy or similar conditions.
  11. Manual & Automatic alarm settings. Alarm should also be available for the following conditions and must get reset automatically if the alarm conditions are rectified or disappear:
    - a) Circuit Blockage
    - b) Leak %
    - c) Oxygen or Air pressure drop.
    - d) Power supply failure
    - e) Low battery
    - f) Ventilator Intraoperative
    - g) Low & High settings for monitored parameters including EtCO<sub>2</sub>, Masimo SpO<sub>2</sub>, when purchased.
  12. There must be servo-controlled humidifier external to ventilator (OEM or Equivalent with USFDA/European CE from four digit notified body)
  13. Trend storage of important data for at least 72 ~ 96 hours.
  14. Monitoring of vital parameters and must include the following:
    - a) RSBI
    - b) Resistance
    - c) Dynamic Compliance
    - d) Time Constant
  15. The scope of supply with each ventilator must include the following:
 

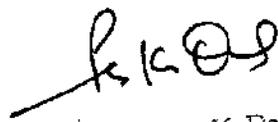
a) External Servo Controlled Humidifier:	1 Set.
b) Test Lung Neonatal:	2 Pc.
c) High Pressure Hoses 3 mt. for the Oxygen and Air:	1 Pc.
d) Exhalation valve diaphragm:	2 Pcs
e) Reusable Proximal type flow sensors, Autoclavable:	5 Pcs
f) Patient Circuit support arm stainless steel:	1 no.
g) Trolley:	1 no.
h) Disposable Dual Heated limb circuits with autofill chamber:	5 nos.
  16. Separate Prices must be quoted for the following items:
    - a) Disposable Flow sensor for infected patients
    - b) Reusable Flow Sensor for re-ordering
    - c) Disposable Dual Heated limb circuits with autofill chamber
    - d) NIV accessories like head gear, nasal prongs, RAM cannula, Circuits etc.
    - e) Temperature Probe for Humidifier
    - f) Battery, if required after 3 years' warranty
    - g) Any other disposable accessory proprietary to ventilator
  17. The Ventilator should have USFDA/European CE from four digit notified body.

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Dr. Krishna Kumar Yadav  
 MD, PhD, FMSA  
 Professor of Pediatrics  
 On Wednesday

## measuring tape

1. Material: Flexible PVC
2. Measurement: Inch/cm
3. Graduations: 1mm
4. Measuring Range: 5-50 cm/ 2-20 Inches
5. Qty: 5 Pieces/Box
6. Certificate: ISO 8322-2:1989



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Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

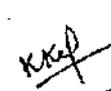


Dr. Krishna Kumar Yadav  
MD PhD, FIMSA  
Professor (Jr. Grade) Pediatrics  
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## Ophthalmoscope (Pediatric)

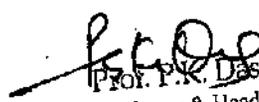
1. Should be rechargeable battery operated
2. Should have red-free and cobalt blue filters
3. Should have LED illumination
4. Should have small and large spot sizes, fixation targets, slit aperture, hemi-spot and cobalt blue filter
5. Should have wheel control with lens powers ranging from +40D to -35D
6. Should have illuminated lens dial
7. Should have rubber brow rest
8. Should have dust free optics and a spherical optical system
9. Should have inbuilt rechargeable battery with charger
10. Should be supplied with a carrying case
11. Should have CE/ISO certification

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Krishna Kumar Yadav  
MD, PhD, FMSA  
Professor (Jr. Grade), Pediatrics  
OPD : Wednesday

## Hemoglobin Meter (Portable)

1. **Measurement Methodology:**
  - a) **Reflectance Photometry:** A light source illuminates a blood sample (usually on a test strip), and the reflected light is measured. The intensity of the reflected light is correlated to the hemoglobin concentration.
  - b) **Sample Type:** Whole blood (capillary, venous, or arterial).
  - c) **Sample Volume:** Typically, 10  $\mu$ L.
2. **Measurement Range and Units:**
  - a) **Measurement Range:** 0 - 25.6 g/dL, 0 - 256 g/L
3. **Units:** g/dL (grams per deciliter), g/L (grams per liter)
4. **Accuracy and Precision:**
  - a) **Accuracy:** Typically, within +/- 1 g/dL of reference lab methods.
  - b) **Precision:** Typically, less than 5% CV (coefficient of variation).
5. **Other Specifications:**
  - a) **Power Source:** Batteries (e.g., 3 AAA rechargeable batteries or a coin cell) or AC adapter.
  - b) **Dimensions:** Typically, small and portable, with dimensions like 100 mm x 54.5 mm x 25.5 mm.
  - c) **Weight:** Lightweight, typically under 100g without batteries.
  - d) **Display:** Digital display to show the hemoglobin reading.
  - e) **Storage:** Typically stored at temperatures between 0-50°C (32-122°F).
  - f) **Operating Conditions:** Operating temperatures usually range from 10-40°C (50-104°F).

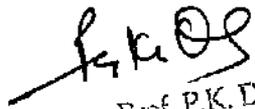
  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Dr. Krishna Kumar Yadav  
 MD PhD, FIMSA  
 Professor (H. H. H. H.) Pediatrics  
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**6. Scope of Supply:**

- a) Main unit-1 no
- b) Test Cartridge/ Strip for 500 tests

7. Device should be USFDA/EU-CE

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Krishna Kumar Yadav  
MD PhD, FIMSA  
Professor (Jr. Grade), Pediatrics  
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**Thermometer (Digital)**

1. Glass and mercury free
2. Digital, electronic version
3. Temperature measurement range 32 – 43 °C (minimum guaranteed)
4. Accuracy  $\pm 0.1^{\circ}\text{C}$  in the range 35 – 41 °C
5. Graduation  $0.3^{\circ}\text{C}$  or better
6. Ready-to-use after switch-on within 10 seconds
7. Measurement time: within 120 seconds
8. Low and high temperature indication
9. Display easy to read in all levels of ambient light
10. Automatic switch-off when not in use
11. Beep audio alert when device is turned on/ready to use or when temperature measurement is complete
12. Low battery indicator
13. Full batteries allow for a minimum of 4,000 measurements
14. Waterproof
15. Designed to withstand frequent cleaning and disinfection with hospital-grade products
16. Battery powered, batteries included in the supply, preferably packed separately
17. Supplied in rigid plastic protective case
18. Estimated life Five to seven years
19. Manufacturer is certified for ISO 13485 Medical devices and Supplier is certified for ISO 9001
20. Device should have electrical safety test IEC 60601

*P.K.P.*  
 Prof. P.K.P.  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

*K.K.P.*  
 Dr. Krishna Kumar Yadav  
 M.D. Ph.D. FIMSA  
 Professor (Jr. Grade), Pediatrics  
 OPD - Wednesday

## Weighing Machine (Neonates)

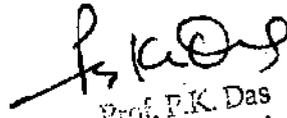
1. Weighing range: up to 20 kg.
2. Minimum graduation: 5 g.
3. Accuracy:  $\pm 5$  g.
4. Precision:  $\pm 5$  g.
5. Display: kg.
6. Tare function.
7. Auto-hold function.
8. Automatic switch-off.
9. Auto-calibration with each switch-on.
10. Large LCD display.
11. Reading time max 5 seconds.
12. Splash proof and shock resistant.
13. Smooth surface/finishing for easy cleaning/disinfection.
14. Material: Body and tray made of non-absorbent ABS plastic.
15. Baby tray dimension approx. (525-600) x (40-80) x (250-280) mm (WxHxD).
16. Overall dimension approx. (525-600) x (130-156) x (332x385) mm (WxHxD).
17. Weight less than 5 kg.
18. Can be powered by battery power or power adapter.
19. Should have CE/ISO certifications.

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Krishna Kumar Yadav  
MD, PhD, FIMSA  
Professor (Jr. Grade), Pediatrics  
OPD - Wednesday

## Weighing Scale (Child)

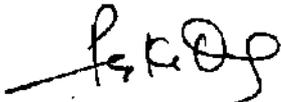
1. Electronic scale for infants and children.
2. Measuring range: up to 50 kg.
3. Graduation: 100 g or better.
4. Accuracy: better than  $\pm 0.15\%$  /  $\pm 100\text{g}$ .
5. Taring function.
6. Power saving feature automatically turns off the scale after 2-6 minutes of non-use.
7. Overall dimension approx. (346-360) x (321-398) x (40-60) mm (LxWxH):
8. Weight should be less than 10 kg.
9. Easily readable display in low light working situations (<450 lumes).
10. Reading time less then approx. 5 seconds.
11. Can be powered by battery power and power adapter.
12. Should have CE/ISO certifications.

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Krishna Kumar Yadav  
MD PhD FIMSA  
Professor (Jr. Gr. Adv.) Pediatrics  
OPD - Wednesday

**Baby Bassinet**

1. Should have removable baby bed
2. The infant cot should be made of single mould unbreakable polycarbonate material
3. Infant cot should be easily removable for cleaning and should have holes in the bottom for draining of water & fluids.
4. Length of the infant cot should be 765 mm
5. Width of the infant cot should be 400 mm.
6. Depth of the infant cot should be 200 mm
7. Should have washable mattress made of high-quality PU Foam
8. Foam bed density should have minimum 26 Kg/m<sup>3</sup>.
9. Baby bed should be put in trendelenburg position
10. Utility tray should be easily removable for cleaning and should have swivel facility
11. Should have baby name plate holder
12. Should have 4" Swivel castors (minimum 2 with brakes)
13. Coating should be of epoxy/powder for scratch resistance & rust protection.
14. The system should have an international (FDA/CE/IEC) approval
15. Should be supplied by an ISO 9001:2008 & ISO13485 certified manufacturer



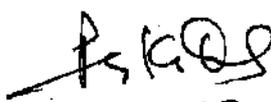
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

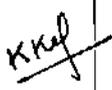


Dr. Krishna Kumar Yadav  
MD PhD FIMS.A  
Professor (Jr. Grade) Pediatrics  
OPD - Wednesday

**Dextrostix**

1. Dextrostix is a screening test used to estimate blood glucose levels using a chemically treated paper strip.
2. It can detect blood glucose concentrations below 20 mg/100 ml and is useful for screening for neonatal hypoglycemia.
3. **Key Features and Specifications:**
  - a) **Test Type:** Screening test for blood glucose.
  - b) **Mechanism:** Dextrostix utilizes a colorimetric reaction to indicate glucose levels.
  - c) **Sample:** A single drop of blood from the fingertip, ear lobe, or heel can be used.
  - d) **Reading:** The color of the strip is compared to a color chart to estimate blood glucose.
  - e) **Interpretation:** Dextrostix can be used for preliminary assessment of blood glucose levels.
  - f) **Limitations:** The color chart may not be accurate for all individuals, and laboratory confirmation is recommended for readings below 20 mg/100 ml.
  - g) **Uses:** Screening for neonatal hypoglycemia, monitoring blood glucose in diabetic patients, and differentiating between hypo- and hyperglycemia.
4. Supply with 500 strips.

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Krishna Kumar Yadav  
MD PhD, FMSA  
Professor (Jr. Child) Pediatrics  
OPD - Wednesday

**Infantometer**

1. Measuring range: 33 – 100 cm / 13 – 39"
2. Graduations: 1 mm or 1/16"
3. Dimensions (WxHxD): approx. 1,105 x 165 x 402 mm
4. Function and Properties: Lying measurement
5. Weight: less than 5 kg
6. Certification: CE/ISO



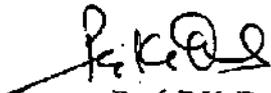
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow



Dr. Krishna Kumar Yadav  
MD, PhD, FIMSA  
Professor (Jr. Grade), Pediatrics  
OPD :- Wednesday

**Multistix**

1. **Multiple Parameters:** The strips test for 10 important markers in urine as a single test, including Specific Gravity, pH, Protein, Glucose, Ketone, Leukocyte Esterase, Bilirubin, Urobilirubin, Nitrite, and Blood.
2. **Point-of-Care Testing:** They are designed for quick and easy testing at the point of care, eliminating the need to send samples to a lab.
3. **Visual and Instrumental Reading:** The strips can be read either visually by comparing color changes to a chart or instrumentally using a reader for more accurate and consistent results.
4. **UTI Detection:** The combination of Leukocyte and Nitrite results helps in better prediction of urinary tract infections (UTIs) with fewer false negatives.
5. **Reliable Results:** The strips are known for their reliability and consistency in providing accurate results.
6. **Scope of supply:** Supply with 500 strips.
7. **Certification:** Should be USFDA/EU-CE.

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Krishna Kumar Yadav  
MD, PhD, FIMSA  
Professor (Jr. Grade), Pediatrics  
OPD :- Wednesday

**Peak flow meter**

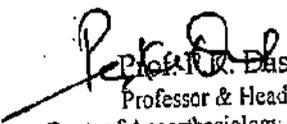
1. Main body: impact-resistant ABS plastic
2. Cover and handle: high-density polypropylene
3. Scale: hot-stamped, alcohol-resistant
4. Shaped mouth piece: oval
5. Handle: folds out, keeps hand away from the air stream thus encourages use of the proper technique for accurate readings
6. Measurement range: 50-500 Litre/minute
7. Accuracy: +/-10%
8. Resistance to flow:  $\leq 0.35\text{kPa/litre/second}$
9. Scale resolution: 10 litre/minute
10. Three color-coded areas indicator to ease for PEF score tracking
11. Complies with EN 13826:2003

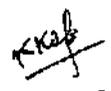
  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Krishna Kumar Yadav  
MD, PhD, FIMSA  
Professor (Jr. Grade), Pediatrics  
OPD - Wednesday

## Rectal Thermometers

1. Rectal thermometers designed with a short, flexible probe and a rounded tip for safe and comfortable insertion into the rectum.
2. Rectal thermometers have a slender, flexible probe with a rounded tip to minimize discomfort during insertion.
3. Should have high accuracy in measuring core body temperature.
4. Digital rectal thermometers typically provide a quick reading within seconds, often within 10 seconds.
5. It should have fever indicator technology that displays different colors (e.g., green for normal, red for fever) to help parents quickly assess the temperature.
6. Should have digital displays, which are safer than mercury thermometers and easier to read.
7. Designed to be waterproof for easy cleaning.
8. Rectal thermometers designed for babies have a security bulb that helps prevent injury during insertion.
9. A normal rectal temperature for babies is typically between 97.7 to 99.7 degrees Fahrenheit (36.7 to 37.9 degrees Celsius).
10. When to Seek Medical Advice: A rectal temperature of 100.4°F (38°C) or higher in babies under 3 months old warrants immediate medical attention.
11. Should have certified for accuracy by reputable organizations like the National Institute of Standards and Technology (NIST).

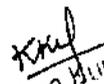
  
 P. K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Dr. Krishna Kumar Yadav  
 MD PhD, FIMSA  
 Professor (Jr. Grade), Pediatrics  
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**Uristix**

1. The Uristix Urinalysis Strips are used for urinalysis testing.
2. Each strip tests for four important markers, glucose, nitrite, leukocytes and protein.
3. The test results will show information pertaining to kidney status such as UTI, diabetes or kidney disorders.
4. The sticks are made from firm plastic and are ready to use.
5. Results can be read visually without any extra equipment.
6. The entire reagent strip is disposable. Store in the bottle at all times.
7. Supply with 10 bottle (100 Strip per bottle)

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Krishna Kumar Yadav  
MD, PhD, FIMSA  
Professor (Jr. Grade) Pediatrics  
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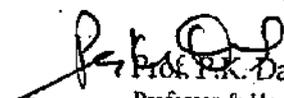
## Neonatal T piece Resuscitator

### A- Air / O<sub>2</sub> Blender Specifications

- i Should possess separate Air and O<sub>2</sub> Blender with dual flowmeter ranging from 0-15LPM and 0-6LPM
- ii Should have FiO<sub>2</sub> Control knob setting ranging from 21% to 100%
- iii Accuracy of FiO<sub>2</sub> should be  $\pm 2\%$
- iv Should have safety bleed valve knob setting at  $<3, <6, & >6$  LPM
- v Blender should be USFDA and CE approved
- vi Should be supplied with Air & O<sub>2</sub> hose pipes one each along with pole mounting clamp

### B- Specifications for T-Piece Resuscitation:

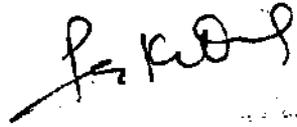
- i Gauge Range should be between -20 to 100 cm H<sub>2</sub>O
- ii Manometer Accuracy should be  $\pm 2$  L/min
- iii Peak Inspiratory Pressure (PIP) @ 05L/min: 02 to 24 cm H<sub>2</sub>O  
 @ 08L/min: 04 to 40 cm H<sub>2</sub>O  
 @ 10L/min: 06 to 48 cm H<sub>2</sub>O
- iv Peak End Expiratory Pressure (PEEP) @ 05L/min: 02 to 08 cm H<sub>2</sub>O  
 @ 08L/min: 04 to 14 cm H<sub>2</sub>O  
 @ 10L/min: 06 to 20 cm H<sub>2</sub>O
- v Gas Inlet Flow Range should range from 05L/min (min) to 10L/min (max)
- vi Maximum Pressure Release should be up to 50 cm H<sub>2</sub>O
- vii Should be compatible for use with heated humidifier

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

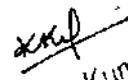
  
 Dr. Krishna Kumar Yadav  
 MD, PhD, FIMSA  
 Professor (Jr. Grade), Pediatrics  
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**C- Mounting Stand for Blender and T-Piece Resuscitator****D- Accessories should be supplied with it**

- i- Resuscitation Masks of Premature size - 10 Pieces
- ii- Resuscitation Circuits with PEEP valve - 10 Pieces
- iii- Reusable autoclavable resuscitation Circuits with PEEP valve- 2 Pieces
- iv- Test lung- One



Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow



Dr. Krishna Kumar Yadav  
MCh, PhD, FIMSA  
Professor (Jr. Grade), Pediatrics  
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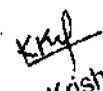
## Neonatal Incubator

1. Should be a Microprocessor Servo Controlled Incubator with air and skin modes of operation with a rise time of 30 minutes  $\pm$  20% per 10°C
2. Should have the large baby access foldable doors at both sides
3. The double wall incubator canopy should be largest at least Length 80 cm, Width 50 cm, and Height 45 cm to accommodate tubing and oxygen hood
4. Should have 4 elbow operated access ports. Should also have one iris port for ventilator tubing and easy head access
5. Should have at least 4 small ports for IV tube and one big iris port hole for other probe sensor cables
6. Should have an integral bed with mattress of Length 68 cm, Width 44 cm, and Height 40 cm. Baby bed should be tiltable to  $\pm$ 12 degree without opening the canopy/doors of the incubator and allow shock less adjustment of the bed angle
7. Baby bed should be withdrawable and rotatable from both the sides
8. The mattress and its internal airflow path should be easily disassembled for cleaning
9. The internal of the incubator should be moulded, rounded without any crevices for easy cleaning and inhibiting bacterial growth
10. Should have Audio & Visual display of alarm conditions
11. Should have water reservoir with water level indicator. The water level should be visible from side of the incubator and should be able to refill water without opening the incubator
12. Should have two temperature probes for patient skin temperature and air temperature measurement
13. Should have in-built baby weighing scale to measure the baby weight without disturbing baby
14. Should have servo oxygenation and motorized height adjustment
15. Should have weighing scale display range of 0 - 7Kg with resolution of 1gm and accuracy  $\pm$ 5gm
16. Should help to maintain humidity inside the incubator with an easy to clean and drain humidity control chamber. The humidity set range should vary from 40 to 90% with servo humidity control range of 30-95%
17. Should have trend display facility for temperature and humidity
18. Should have X-ray tray holder with X-ray scaling
19. Should have rust free 5" antistatic castors with brakes
20. Controller Specification:

Modes of Operation: Air Mode

Baby Mode (Servo Mode)

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Dr. Krishna Kumar Yadav  
 MD, PhD, FIMSA  
 Professor (Jr. Grade), Pediatrics  
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## 21. Temperature Specification:

Air Mode Control:	Control	30.0 -37.0°C
	Override	37.0-39.0°C
	Display	15.0-45.0°C
	Resolution	0.1°C
	Accuracy	±0.5°C

Baby Mode Control:	Control	35.0-37.0°C
	Override	37.0-38.0°C
	Display	15.0-45.0°C
	Resolution	0.1°C
	Accuracy	±0.5°C

Humidity:	Setting range	40-90% (in 1% increments)
	Display range	0-100%
	Resolution	1%
	Accuracy	±10%
	Reservoir capacity	1200ml

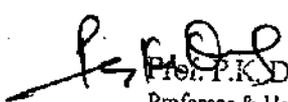
22. Display: Should have 7 inch color display with touch control for digital display and comprehensive alarms should display heater power in digital forms should have alarm mute facility and alarm tone differentiation for different parameters Control Panel should be liquid proof

## 23. Temperature Alarms:

- Baby Set Temperature: +/-0.5 degree Celsius
- Air Set Temperature: +/-0.5 degree Celsius
- High/Low Air Temperature
- Air Probe Failure
- Skin Probe Failure/Disconnect
- Air Flow Failure/ Disconnect
- Oxygen low / high
- Humidity low / high

## 24. System failure alarms:

- Fan failure
- Power Failure
- Air Heater Failure

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Dr. Krishna Kumar Yadav  
 MD, PhD, FIMSA  
 Professor (Jr. Consultant), Pediatrics  
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- d) Door opening
- e) Water reservoir empty
- f) Water heater failure

- 25. Automatic heater should be cutoff if the temperature inside the incubator exceeds 39.3 deg C
- 26. Should use low noise blower for circulation of air inside the incubator and it should be less than 60 dB
- 27. Should be provided with a big storage drawer for keeping essentials of the baby and 3 small trays
- 28. Should be provided with height adjustable IV stand
- 29. Should confirm to IEC -60601-1 electrical safety standard for medical equipment
- 30. Should be supplied by an ISO 13485 certified manufacturer
- 31. Should be USFDA or European CE Certified from notified body



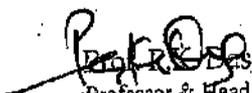
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow



Dr. Krishna Kumar Yadav  
MD, PhD, FIMSA  
Professor (Jr. Grade), Pediatrics  
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## Transport Incubator "with ventilator"

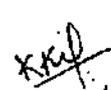
1. Double wall transparent canopy with mattress
2. Size of the incubator/canopy should be approx. around 60×130×55 (cm) (H×L×W)
3. Front and head end access doors with access portholes with elbow operated flip doors and lock chips, tubing access ports and iris port for ventilator tubing
4. Incubator should have sliding acrylic baby tray to resuscitate baby and to take X-rays
5. Incubator should have re-usable mattress
6. Should have a slide-out mattress tray with baby restraining straps
7. Should have external head up/down positioning facility
8. Should have servo-control humidification system with humidity indicator, for ventilator module, inlet for oxygen and intravenous tunings
9. Should have soft-touch keys to set the desired parameter values
10. Should have resuscitation console with suction unit for neonatal use
12. Should have microprocessor- based servo-control temperature control system with digital display of actual and set temperature of air and skin
13. Range of temperature:
  - a) For skin control: 34 to 38<sup>0</sup> C
  - b) For air control: 22 to 39<sup>0</sup> C
  - c) Resolution: 0.1<sup>0</sup> C
  - d) Accuracy: ± .2<sup>0</sup> C within set temp
14. Should have heater output display in %
15. Audio-visual alarms: high/low air temperature (±0.5°C), high and low skin temperature (±0.5°C), temperature sensor failure, power failure and low battery, skin mode of + 0.5<sup>0</sup> C temperatures, system failure
16. Safety cut off at 38<sup>0</sup> C for skin and 39<sup>0</sup> C for air with audio and visual alarms
17. Mounted on a stretchable trolley with adjustable height
18. Trolley should be light weight on four locking castors with handles
19. System must be capable of being securely installed in ambulance

  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

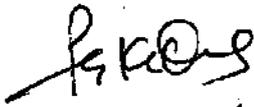
  
 Dr. Krishna Kumar Yadav  
 MD, PhD, FIMSA  
 Professor (Jr. Consultant, Pediatrics)  
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20. Should have forced air circulation system with bacterial filter to remove air born particles
21. One Syringe infusion pumps with stand. It should be compatible with 10, 20 and 50 ml syringes of locally available brand of syringes. Range of infusion rate 1-99 ml/ hour in steps of 0.1ml. Display infusion rates along with alarms for occlusions, end of infusion with internal rechargeable battery should be provided along with the quoted price
22. Heart and Oxygen saturation (based on Massimo SET technology) monitor: Fixed, built monitors, dual wavelength probe for Oxygen saturation with Digital LED display for Heart rate and Oxygen saturation. Alarms for high and low for Heart Rate, Oxygen saturation and probe failure
23. Two 10L integrated oxygen cylinders, regulator and flow meter
24. Indicators for Mains and Battery Modes of Operation
25. Indicator for Battery Power Capacity
26. Should have internal light for illumination
27. Should include integrated inbuilt pneumatic ventilator
28. Basic ventilator (Pressure limited, time cycled) with at least CPAP and SIMV modes with controls for CPAP/PEEP (0-10 cm H<sub>2</sub>O), PIP (15-60 cm H<sub>2</sub>O; rate, Ti and FiO<sub>2</sub> (adjustable from 21-100%) firmly secured with ventilator
29. Should have integrated inbuilt medical air compressor
30. Should have options of Wall Gas Supply or Cylinder Supply
31. Should have option for humidification
32. Should have inbuilt IV stand
33. Should give space provision for mounting syringe pumps, patient monitoring and other accessories
34. Oxygen analyzer with digital display of oxygen concentration
35. Suction unit suitable for Neonatal Use
36. Battery and AC supported
37. Indicators for Mains and Battery Modes of Operation
38. Indicator for Battery Power Capacity

  
 Prof. H.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Dr. Krishna Kumar Yadav  
 M.D. Ph.D. FIMSA  
 Professor (Jr. Grade), Pediatrics  
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39. Built-in-sealed rechargeable batteries capable of working for at least 3hrs when fully charged
40. On-site demonstration is essential
41. All vital parts made of rust proof materials.
42. Accessories to be supplied:
  - a) Re-usable ventilator circuit: 2
  - b) Disposable ventilator circuit: 15
  - c) Re-usable skin temperature probe: 5
  - d) Re-usable saturation probe: 5
  - e) Syringe infusion pump: 1
  - f) Patient Monitor: 1
  - g) 10L oxygen cylinders: 2
  - h) Re-usable mattress: 1
43. Should have US FDA / European CE certification



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Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

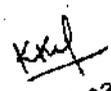


Dr. Krishna Kumar Yadav  
MD PhD, FIMSA  
Professor (Jr. Grade), Pediatrics  
OPD - Wednesday

## "High End" Specifications for Transport Incubator "with ventilator"

1. Double wall transparent canopy with mattress
2. Size of the incubator/canopy should be approx. around 60×130×55 (cm) (H×L×W)
3. Front and head end access doors with access portholes with elbow operated flip doors and lock chips, tubing access ports and iris port for ventilator tubing
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9. Should have soft-touch keys to set the desired parameter values
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  - a) For skin control: 34 to 38<sup>0</sup> C
  - b) For air control: 22 to 39<sup>0</sup> C
  - c) Resolution: 0.1<sup>0</sup> C
  - d) Accuracy: ± .2<sup>0</sup> C within set temp
14. Should have heater output display in %
15. Audio-visual alarms: high/low air temperature (±0.5<sup>0</sup>C), high and low skin temperature (±0.5<sup>0</sup>C), temperature sensor failure, power failure and low battery, skin mode of + 0.5<sup>0</sup> C temperatures, system failure
16. Safety cut off at 38<sup>0</sup> C for skin and 39<sup>0</sup> C for air with audio and visual alarms
17. Mounted on a stretchable trolley with adjustable height
18. Trolley should be light weight on four locking castors with handles
19. System must be capable of being securely installed in ambulance

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Dr. Krishna Kumar Yadav  
 MD PhD FIMSA  
 Professor (Jr. Grade) Pediatrics  
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20. Should have forced air circulation system with bacterial filter to remove air born particles
21. One Syringe infusion pumps with stand. It should be compatible with 10, 20 and 50 ml syringes of locally available brand of syringes. Range of infusion rate 1-99 ml/ hour in steps of 0.1ml. Display infusion rates along with alarms for occlusions, end of infusion with internal rechargeable battery should be provided along with the quoted price
22. Heart and Oxygen saturation (based on Massimo SET technology) monitor: Fixed, built monitors, dual wavelength probe for Oxygen saturation with Digital LED display for Heart rate and Oxygen saturation. Alarms for high and low for Heart Rate, Oxygen saturation and probe failure
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25. Indicator for Battery Power Capacity
26. Should have internal light for illumination
27. Should include integrated inbuilt pneumatic ventilator
28. Basic ventilator (Pressure limited, time cycled) with at least CPAP and SIMV modes with controls for CPAP/PEEP (0-10 cm H<sub>2</sub>O), PIP (15-60 cm H<sub>2</sub>O, rate, Ti and FiO<sub>2</sub> (adjustable from 21-100%) firmly secured with ventilator
29. Should have integrated inbuilt medical air compressor
30. Should have options of Wall Gas Supply or Cylinder Supply
31. Should have option for humidification
32. Should have inbuilt IV stand
33. Should give space provision for mounting syringe pumps, patient monitoring and other accessories
34. Oxygen analyzer with digital display of oxygen concentration
35. Suction unit suitable for Neonatal Use
36. Battery and AC supported
37. Indicators for Mains and Battery Modes of Operation
38. Indicator for Battery Power Capacity

  
Prof. P.K. Das

Professor & Head  
Dept. of Anaesthesiology & CGM  
Dr. RMLIMS, Lucknow

  
Dr. Krishna Kumar Yadav  
MD PhD, FIMSA  
Professor of Clinical Pediatrics  
OPD - Pediatric Day

39. Built-in-sealed rechargeable batteries capable of working for at least 3hrs when fully charged
40. On-site demonstration is essential
41. All vital parts made of rust proof materials.
42. Should have US FDA certification
- 43.. Accessories to be supplied:
  - a) Re-usable ventilator circuit: 2
  - b) Disposable ventilator circuit: 15
  - c) Re-usable skin temperature probe: 5
  - d) Re-usable saturation probe: 5
  - e) Syringe infusion pump: 1
  - f) Patient Monitor: 1
  - g) 10L oxygen cylinders: 2
  - h) Re-usable mattress: 1



Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow



Dr. Krishna Kumar Yadav  
MD, PhD, FIMSA  
Professor (Jr. Grade), Pediatrics  
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### "Advanced" 7 Para Neonatal Monitor

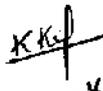
1. Monitor should have facility for Monitoring the following parameters- ECG, Respiration, SpO<sub>2</sub>, NIBP, EtCO<sub>2</sub> micro-stream and Temperature & Dual Invasive Pressure
2. Monitor should be Upgradeable to Cardiac Output
3. Monitor should have facility to display at least 8 waveforms simultaneously
4. Should have Integrated High resolution Backlit LED display of at least 15" Touch screen
5. The monitor should operate on Rotary knob & Touch pads
6. Weight of monitor should not be more than 5 Kg
7. At least of the Keys should be user configurable
8. Monitor should have ST segment analysis and Arrhythmia Detection facility
9. SpO<sub>2</sub> should be high acuity like Masimo or Nellcor with facility to display Plethysmograph, SpO<sub>2</sub> values and Pulse rate
10. The Monitor should have advanced Alarm management system with facility to grade the alarm by priority (at least 3 levels)
11. Advanced alarm management should include software for reduction of Nuisances / irrelevant alarms
12. Monitor should have Reminder alarm and Timer facility
13. Monitor should be able to store & recall trends for at least 150 hours in both Graphical & Tabular format
14. Monitor should have facility to store & recall at least 5 pages of ECG for later review.
15. To enable ease of viewing Monitor should have a separate Alarm page for display of at least 30 alarm conditions
16. Monitor should have ease of setting of limits through Auto set as well as manually
17. Invasive Blood Pressure Zeroing should be easy with facility to Zero either from monitor or from the cable close to the patient

  
 Prof. F.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Dr. Krishna Kumar Yadav  
 MD, PhD, FIMSA  
 Professor (Jr. Grade), Pediatrics  
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18. Monitor should have port for connectivity to devices like IABP for easy synchronization
19. Monitor should have facility for connecting High resolution Large displays through latest HDMI ports
20. Should be able to communicate with the Central Station in either Wired OR wireless form
21. Monitor should have USB port for ease of patient data download as well as software uploads
22. **Accessories**
  - SpO2 Sensor: Paed -02, Neonate-02
  - NIBP Cuff: Paed-05, Neonate -05
  - ECG Leads: 3 Leads -02
  - Temp Probe: Rectal-01, Skin-01
  - EtCO2 probe: 02
  - IBP Kit: Pediatric/Neonatal-02
23. Monitor must be U.S FDA approved
24. Manufacturer should have ISO-13485:2008 certification for quality standards

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Krishna Kumar Yadav  
MD, PhD, FIMSA  
Professor (Jr. Grade), Pediatrics  
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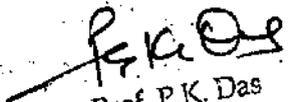
### "High End" 5 Para Neonatal Monitor

1. Monitor should have facility for Monitoring the following parameters- ECG, Respiration, SpO<sub>2</sub>, NIBP and Temperature & Dual Invasive Pressure.
2. Monitor should be Upgradeable to EtCO<sub>2</sub> module microstream
3. Monitor should have facility to display at least 6 waveforms
4. Should have Integrated High resolution Backlit LED display of at least 12" Touchscreen
5. The monitor should operate on Rotary knob & Touch pads
6. Weight of monitor should not be more than 5 Kgs
7. At least of the Keys should be user configurable
8. Monitor should have ST segment analysis and Arrhythmia Detection facility
9. SpO<sub>2</sub> should be high acuity like Masimo or Nellcor with facility to display Plethysmograph, SpO<sub>2</sub> values and Pulse rate
10. The Monitor should have advanced Alarm management system with facility to grade the alarm by priority (at least 3 levels)
11. Advanced alarm management should include software for reduction of Nuisances/ irrelevant alarms
12. Monitor should have Reminder alarm and Timer facility
13. Monitor should be able to store & recall trends for at least 150 hours in both Graphical and Tabular format
14. Monitor should have facility to store and recall at least 5 pages of ECG for later review
15. To enable ease of viewing Monitor should have a separate Alarm page for display of at least 30 alarm conditions
16. Monitor should have ease of setting of limits through Auto set as well as manually
17. Invasive Blood Pressure Zeroing should be easy with facility to Zero either from monitor or from the cable close to the patient
18. Monitor should have port for connectivity to devices like IABP for easy synchronisation
19. Monitor should have facility for connecting High resolution Large displays through latest HDMI ports

  
 Prof. P.K. Das Dr. Kusuma Kumar Yadav  
 Professor & Head MD PhD, FIMSA  
 Dept. of Anaesthesiology & CCU Professor (Jr. Grade) Pediatrics  
 Dr. RMLIMS, Lucknow OPD - Wednesday

20. Should be able to communicate with the Central Station in either Wired OR wireless form Monitor should have USB port for ease of Patient data download as well as software uploads
21. Accessories:-  
SpO2 Sensor: Paed-02, Neonate-02  
NIBP Cuff :Paed-05, Neonate -05  
ECG Leads: 3 Leads -02  
Temp Probe: Rectal-01, Skin-01
22. Monitor must be European CE / USFDA approved
23. Manufacturer should have ISO-13485:2016 certification for quality standards

  
Dr. Krishna Kumar Yadav  
MD, PhD, FIMSA  
Professor (Jr. Grade), Pediatrics  
OPD :- Wednesday

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## "Basic" Specifications for Neonatal Monitor

1. Pulse Oximeter should be suitable for Neonatal and Pediatric Patients
2. Should have touchscreen LCD color display with adjustable brightness
3. Should have Parameters- Numerical Display of SpO<sub>2</sub>, Pulse Rate, Perfusion Index & PVI
4. Should have Variable Pleth Waveform
5. Trend display up to 96 hours at 2 seconds sampling rate
6. Access to Menu and user settings for configuring and managing alarms
7. **Display Range:**
  - a) Oxygen Saturation (SpO<sub>2</sub>) - 0 - 100%
  - b) Pulse Rate (PR) - 25-240bpm
  - c) Perfusion Index (PI) - 0.02-20%
8. **NIBP (Pediatric/ Neonatal)**
  - a) Systolic- 40-230 mmHg/ 40-130 mmHg
  - b) Diastolic- 26-183 mmHg/ 26-110 mmHg
  - c) MAP- 20-160 mmHg/ 20-100 mmHg
  - d) Motion Tolerant NIBP
9. **Saturation Accuracy:**
  - a) **Saturation Range:** 60% to 80%  
Accuracy when there is no Motion: Infants/Pediatrics/Neonatal: 3%
  - b) **Saturation Range:** 70% to 100%  
Accuracy when there is no Motion: Infants/Pediatrics: 2%, Neonates: 3%  
Accuracy when there is Motion: Infants/Pediatrics/Neonates: 3%  
Accuracy when there is Low Perfusion: Infants/Pediatrics/Neonates: 2%
10. **Pulse Rate Accuracy:**  
**Pulse Rate Range:** 25 - 240 bpm  
Accuracy when there is no Motion: Infants/Pediatrics/Neonates: 3 bpm  
Accuracy when there is Motion: Infants/Pediatrics/Neonates: 5 bpm  
Accuracy when there is Low Perfusion: Infants/Pediatrics/Neonates: 3 bpm
11. **SpO<sub>2</sub> Modes & Sensitivity:**
  - a) Averaging modes: 2, 4, 8, 10, 12, 14 or 16 seconds
  - b) Sensitivity: APOD, Normal and Max
12. **Technical Requirements:**
  - a) Should have Signal Extraction Technology
  - b) Start-up time - Less than 60 Seconds
  - c) Should generate audible pulse tone during motion and low perfusion
  - d) Should display SpO<sub>2</sub>, Pulse Rate and perfusion index (PI) readings during motion and low perfusion
  - e) Should have provision for Desaturation Index and 3D alarms
13. **Alarms**  
Audible and visual alarms for High/Low SpO<sub>2</sub>, High/Low Pulse Rate, High/Low PVI, probe off, cable disconnects and low battery

*KRF*  
Dr. Krishna Kumar Yadav  
MD, PhD, FIMSA  
Pediatrics  
Professor  
Wednesday

*P.K.D.*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

14. Battery Should have rechargeable and capacity minimum 5 hours

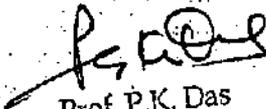
15. Weight should be less than 2 kg

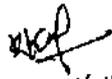
16. Accessories Should be Included as Standard:

- a) Pediatric Reusable SpO<sub>2</sub> Sensor, length 3 ft – 02 pc/unit
- b) Neonatal Multisite Reusable SpO<sub>2</sub> sensor, length 3 ft – 02 pc/unit
- c) Monitor trolley- 01 nos.

17. Certification:

- Should be valid US FDA / EU CE certified product
- Manufacturer/Supplier should have ISO certification for quality standards

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Krishna Kumar Yadav  
MD, PhD, FIMSA  
Professor (Jr. Grade), Pediatrics  
OPD - Wednesday

## "Advanced" Neonatal/Pedia Ventilator

1. Ventilator should be a microprocessor-controlled based with 15" or more color TFT touch screen integrated graphics and easy to use rotary knob operation providing support to neonatal and pediatric patient.
2. The display should be tilt able and rotatable for better and easy viewing.
3. Ventilator must have turbine driven or compressor driven. The external compressor should be from the same manufacturer.
4. Should have proximal flow sensing technology or equivalent which ensures the most precise flow and pressure measurements for better patient assessment.
5. Ventilator should have the following modes:
  - a) Pressure control and assist ventilation.
  - b) SIMV and SIMV with pressure support.
  - c) CPAP/ Pressure Support Ventilation (PSV).
  - d) APRV.
  - e) DuoPAP/BIPAP/BiVent.
  - f) NIV (PC), NIV (PS).
  - g) Nasal CPAP mode.
  - h) Dual mode like PRVC/APV/Auto flow/VAPS.
  - i) High flow oxygen therapy
6. Should have Automatic close loop control mode for pediatric patient like MMV/ASV or equivalent.
7. It should have Invasive as well as Non-Invasive Ventilation modes with facility of effective leak compensation.
8. Ventilator should have main stream EtCO<sub>2</sub>.
9. Ventilator should have standard Spo<sub>2</sub> (for future upgradation of close loop oxygenation)
10. The ventilator should have standard facilities like
  - a) Tube resistance Compensation.
  - b) On screen help.
11. Ventilator should have facility for Lung maneuver to find the recruitability of the ARDS Lung along with the facility to calculate the LIP and UIP for finding the optimum PEEP for the difficult to ventilate patients.
12. The machine should have the spontaneous breathing trail or equivalent for better and successful weaning.

*Kuf*  
 Dr. Krishna Kumar Yadav  
 MD, PhD, FIMSA  
 Professor of Pediatrics  
 OPD Tuesday

*P.K.D.*  
 Dr. P. K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

13. The ventilator should represent virtual lung which shows changes in lung mechanics including spontaneous activity of the patient.
14. Should have Visual representation of ventilator dependency, grouped into oxygenation, CO<sub>2</sub> elimination, and patient activity.
15. Ventilator should have following setting parameters:
- Controls: Tidal volume minimum 2ml to 300ml or better.
  - Respiratory rates 1 to 150 BPM or better.
  - Peak flow setting from 0 to 220 LPM or better.
  - Trigger sensitivity: - Flow 0.1 to 5.0 l/min, Pressure Trigger: -0.1 to -15 cm H<sub>2</sub>O.
  - PEEP: 0 to 25cmH<sub>2</sub>O or better.
  - FiO<sub>2</sub>: 21 to 100 %.
  - I:E ratio 1:9 to 4:1
  - Inspiratory time (TI) 0.1 to 12s.
  - Pressure control 3 to 60 cmH<sub>2</sub>O.
  - Pressure support 0 to 60 cmH<sub>2</sub>O.
  - Pressure ramp 0 to 600ms.
  - Expiratory trigger sensitivity (ETS) 5 to 80% of inspiratory peak flow.
16. Should have facility of following:
- Manual Breath
  - O<sub>2</sub> Enrichment
  - standby
  - screen-lock
  - apnea backup ventilation
  - Inspiratory hold
  - Expiratory Hold
  - Suctioning tool
  - Automatic brightness control of display
  - Configurable Quick Start-Settings
  - Start-up over body height or IBW.
17. . Should have following Alarms:
- low/high Minute Volume
  - Low/high Pressure
  - Low/high tidal volume
  - low/ high Rate
  - Apnea time
  - low/high oxygen
  - Oxygen concentration
  - Loss of PEEP
  - Patient Disconnection
  - Exhalation obstruction
  - Flow sensor
  - Power supply
  - Batteries
  - Gas supply failure.
18. Should have Graphic display of target and actual parameters.

*K. K. Yadav*  
 Dr. Krishna Kumar Yadav  
 Professor & Head FIMSA  
 Dept. of Pediatrics  
 Wednesday

*P. K. Das*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

19. Should have Real-time waveforms Pressure, Flow, Volume, P-trachea, Pes as standard. EtCO<sub>2</sub> and SpO<sub>2</sub>.
20. Should have facility to show minimum 3 waveforms and at least 2 Loops simultaneously. P-V, V-Flow, P-Flow should be available as standard.
21. Should have graphical trends for minimum of 72 hours.
22. Should have Ultrasonic or mesh vibrating nebulizer for neonatal/pediatric patients.
23. Should display vital monitoring parameters including Exhaled tidal volume, Breath rate, I:E ratio, FiO<sub>2</sub>, Peak Pressure, Mean Airway Pressure, delta P (driving pressure) etc.
24. Source input pressure of oxygen: 41 to 60 psi.
25. Should have inbuilt oxygen sensor and it should be cover under warranty.
26. Internal rechargeable battery with minimum operating time of at least 90 minutes or more.
27. Should have Interface connectors USB/RS -232 and connecting facility to PDMS.
28. Ventilator should be supply with servo control humidifier and it should be US FDA & European CE approved.
29. Ventilator should be supplied with the following:
  - a) Servo control humidifier- 1 no.
  - b) Flow sensors with each ventilator - 10 nos.
  - c) Disposable dual heated breathing circuit for Neonatal/Pediatrics - 10 numbers
  - d) Re-usable dual heated breathing circuit for Neonatal/Pediatrics - 2 numbers
  - e) Test lung Neonatal - 1 no.
  - f) Oxygen hose - 1 no.
  - g) Air hose - 1 no (for compressor-based ventilators)
  - h) Power cable - 1 no.
  - i) Support Arm- 1 no.
  - j) Nebulizer kit-1 no.
  - k) EtCO<sub>2</sub>- 1 no.
  - l) SpO<sub>2</sub> kit- 1 no.
  - m) Air compressor - 1 no. (only for compressor base)
30. The complete unit must be mounted on a same make trolley with locking facility for easy movement of the complete ventilator within hospital.
31. Ventilator should be US FDA approved from four digit notified body
32. Ventilator should be ISO (latest) certified.
33. Ventilator should be CDSCO approved for Manufacturer or Importer

*KKP*  
 Dr. Krishna Kumar Yadav  
 FIMSA  
 Pediatrics  
 Prof. ...

*P.K.D.*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## "High End" Neonatal/Pedia Ventilator

1. Ventilator should be a microprocessor-controlled based with 12" or more touch screen integrated graphics and easy to use rotary knob operation providing support to neonatal and pediatric patient.
2. The display should be tilt able for better viewing.
3. Ventilator must have turbine driven or compressor driven. The external compressor should be from the same manufacturer.
4. Should have proximal flow sensing technology or equivalent which ensures the most precise flow and pressure measurements for better patient assessment.
5. Ventilator should have the following modes:
  - a) Pressure control and assist ventilation.
  - b) SIMV and SIMV with pressure support.
  - c) CPAP/ Pressure Support Ventilation (PSV).
  - d) APRV.
  - e) DuoPAP/BIPAP/BiVent.
  - f) NIV (PC), NIV (PS).
  - g) Nasal CPAP mode.
  - h) Dual mode like PRVC/APV/Auto flow/VAPS.
  - i) High flow oxygen therapy
6. It should have Invasive as well as Non-Invasive Ventilation modes with facility of effective leak compensation.
7. Ventilator should have main stream EtCO<sub>2</sub>.
8. The ventilator should have standard facilities like
  - a) Tube resistance Compensation.
  - b) On screen help.
9. Ventilator should have facility for Lung maneuver to find the recruitability of the ARDS Lung along with the facility to calculate the LIP and UIP for finding the optimum PEEP for the difficult to ventilate patients.
10. The machine should have the spontaneous breathing trail or equivalent for better and successful weaning.
11. The ventilator should represent virtual lung which shows changes in lung mechanics including spontaneous activity of the patient.
12. Should have Visual representation of ventilator dependency, grouped into oxygenation, CO<sub>2</sub> elimination, and patient activity.

*Kay*  
 Dr. Krishna Kumar Yadav  
 MD, PhD, FIMSA  
 Professor (Jr. Grade) Pediatrics  
 OPD - Wednesday

*P.K.D.*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

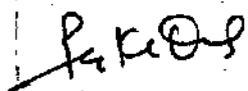
13. Ventilator should have following setting parameters:
- Controls: Tidal volume minimum 2ml to 300ml or better.
  - Respiratory rates 1 to 150 BPM or better.
  - Peak flow setting from 0 to 220 LPM or better.
  - Trigger sensitivity: - Flow 0.1 to 5.0 l/min, Pressure Trigger: -0.1 to -15 cm H<sub>2</sub>O.
  - PEEP: 0 to 25cmH<sub>2</sub>O or better.
  - FiO<sub>2</sub>: 21 to 100 %.
  - I:E ratio 1:9 to 4:1
  - Inspiratory time (TI) 0.1 to 12s.
  - Pressure control 3 to 60 cmH<sub>2</sub>O.
  - Pressure support 0 to 60 cmH<sub>2</sub>O.
  - Pressure ramp 0 to 600ms.
  - Expiratory trigger sensitivity (ETS) 5 to 80% of inspiratory peak flow.
14. Should have facility of following:
- Manual Breath
  - O<sub>2</sub> Enrichment
  - standby
  - screen-lock
  - apnea backup ventilation
  - Inspiratory hold
  - Expiratory Hold
  - Suctioning tool
  - Automatic brightness control of display
  - Configurable Quick Start-Settings
  - Start-up over body height or IBW.
15. Should have following Alarms:
- low/high Minute Volume
  - Low/high Pressure
  - Low/high tidal volume
  - low/ high Rate
  - Apnea time
  - low/high oxygen
  - Oxygen concentration
  - Loss of PEEP
  - Patient Disconnection
  - Exhalation obstruction
  - Flow sensor
  - Power supply
  - Batteries
  - Gas supply failure.
16. Should have Graphic display of target and actual parameters.
17. Should have Real-time waveforms Pressure, Flow, Volume, Ptachea, Pes as standard,
18. Should have facility to show minimum 3 waveforms and at least 2 Loops simultaneously. P-V, V-Flow, P-Flow should be available as standard.

*K.K.*  
 Dr. Krishna Kumar Yadav  
 MD, PhD, FIMSA  
 Professor (Jr. Grade), Pediatrics  
 OPD :- Wednesday

*P.K.D.*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

19. Should have graphical trends for minimum of 72 hours.
20. Should have Ultrasonic or mesh vibrating nebulizer for neonatal/pediatric patients.
21. Should display vital monitoring parameters including Exhaled tidal volume, Breath rate, I:E ratio, FiO<sub>2</sub>, Peak Pressure, Mean Airway Pressure, delta P (driving pressure) etc.
22. Source input pressure of oxygen: 41 to 60 psi.
23. Should have inbuilt oxygen sensor and it should be cover under warranty.
24. Internal rechargeable battery with minimum operating time of at least 90 minutes or more.
25. Should have Interface connectors USB/RS -232 and connecting facility to PDMS.
26. Ventilator should be supply with servo control humidifier and it should be US FDA & European CE approved.
27. Ventilator should be supplied with the following:
  - a) Servo control humidifier- 1no.
  - b) Flow sensors with each ventilator - 10 nos.
  - c) Disposable dual heated breathing circuit for Neonatal/Pediatrics - 10 numbers
  - d) Re-usable dual heated breathing circuit for Neonatal/Pediatrics - 02 numbers
  - e) Test lung Neonatal - 1 no.
  - f) Oxygen hose - 1 no.
  - g) Air hose - 1 no (for compressor-based ventilators)
  - h) Power cable - 1 no.
  - i) Support Arm- 1 no.
  - j) Nebulizer kit-1 no.
  - k) EtCO<sub>2</sub> kit- 1 no.
  - l) Air compressor - 1 no. (only if required)
28. The complete unit must be mounted on a same make trolley with locking facility for easy movement of the complete ventilator within hospital.
29. Ventilator should be US FDA approved from four digit notified body
30. Ventilator should be ISO (latest) certified.
31. Ventilator should be CDSCO approved for Manufacturer or Importer

  
 Dr. Krishna Kumar Yadav  
 MD, PhD, FIMSA  
 Professor (Jr. Grade), Pediatrics  
 OPD - Wednesday

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## "Basic" Neonatal/Pediatric Ventilator

1. ICU Ventilator should be microprocessor controlled and designed for the ventilating Premature, Infant, Neonatal and Pediatric patient.
2. Should be turbine-based or compressor based. The external compressor should be from the same manufacturer and it should be US FDA and European CE approved.
3. Ventilator should have min 8" inch TFT color touch screen with a rotatory encoder knob for dual safety.
4. Should be proximal flow sensing technology.
5. Ventilator should have upgradable option to mainstream EtCO<sub>2</sub>.
6. The ventilator should have standard facilities like
  - a) On screen help
  - b) Automatic pre & post oxygenation and stand-by function for suctioning.
  - c) LPO-Low pressure oxygen for intra hospital transportation.
  - d) Spontaneous breathing trial
7. Should have O<sub>2</sub> cells/O<sub>2</sub> sensors and it should cover under warranty.
8. The ventilator should have following Modes of ventilation:
  - a) Pressure control and assist ventilation.
  - b) Dual control modes like PRVC/APV/Auto flow etc.
  - c) SIMV & SIMV with pressure support ventilation.
  - d) PSV/CPAP-PS.
  - e) NIV (PC), NIV (PS).
  - f) APRV.
  - g) DuoPAP/BIPAP/BiVent.
9. The ventilator should have the following Setting Parameter
  - a) Tidal Volume: 2-300ml
  - b) RR: 1-80b/min

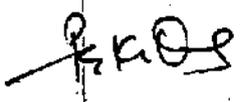
Dr. Krishna Kumar Yadav  
 MD, PhD, FIMSA  
 Prof. Pediatrics  
 Wednesday

*P.K. Das*

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

- c) I:E Ratio: 1:9 to 4:1
  - d) P-Insp: 3-45cmH<sub>2</sub>O
  - e) PEEP/CPAP: 3 to 25cmH<sub>2</sub>O
  - f) Trigger, flow (l/min) 0.1 to 5.0
  - g) P Support 0 to 45cmH<sub>2</sub>O
10. The machine should have battery backup min 2 hrs.
  11. Should display vital monitoring parameters including Exhaled tidal volume, Breath rate, I:E ratio, FiO<sub>2</sub>, Peak Pressure, Mean Airway Pressure etc.
  12. Circuit check for compliance & Leakage compensation for circuit
  13. The machine should have 360° visual alarm with audible High, Medium, and Low Priority Alarm facility.
  14. The machine should have graphical display of Pressure, Volume, Flow as standard and (EtCo<sub>2</sub>) as optional.
  15. Source input pressure of oxygen: 41 to 60 psi.
  16. Should have graphical trends for maximum of 72 hours.
  17. Should have display facility of Loops: Pressure/Volume, Pressure/Flow, Volume/Flow as standard.
  18. Should have Interface connecting facility to PDMS.
  19. Ventilator should be supplied with the following.
    - a) Flow sensors with each ventilator – 10 nos.
    - b) Disposable dual heated breathing circuit for Neonatal/Pediatrics – 10 numbers.
    - c) Re-usable dual heated breathing circuit for Neonatal/Pediatrics – 2 numbers.
    - d) Test lung Neonatal – 1 no
    - e) Oxygen hose – 1no.
    - f) Power cable – 1 no.
    - g) Servo-controlled Humidifier- 1 no.
    - h) Air compressor – 1 no. (only if required)

  
 Dr. Krishna Kumar Yadav  
 MD, PhD, FIMSA  
 Professor of Pediatrics  
 Children's Hospital, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

20. Servo controlled humidifier should be US FDA and European CE.
21. The trolley and support arm should be from the same manufacturer.
22. Ventilator should be US FDA / European CE approved
23. Ventilator should be ISO (latest) certified.
24. Ventilator should be CDSCO approved for Manufacturer or Importer

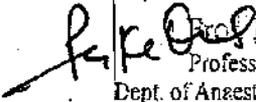
*KKJ*  
Dr. Krishna Kumar Yadav  
MD, PhD, FIMSA  
Professor (Jr. Grade), Pediatrics  
OPD - Wednesday

*P.K.D.*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

### Single Surface Led Phototherapy Unit

1. Light unit should be made of easily cleanable plastic material
2. It should have fan less technology
3. Should consist of 9 or more blue LEDs for treatment and 2 white LEDs for observation at top light unit
4. Life time of the LED's should be more than 1 lakh hours
5. Spectral Irradiance of minimum  $35 - 45 \mu\text{W}\cdot\text{cm}^{-2}\cdot\text{nm}^{-1}$  at 45 cm distance between bed and light unit
6. Wavelength: between 445 - 470 nm, and should be free from UV and IR radiation
7. Effective surface area should be at least  $250 \times 500 \text{ mm}^2$  within an irradiance ratio of 0.4 (min/max irradiance)
8. Should have adjustable Light Intensity (high / low settings)
9. Digital Timer for monitoring therapy hours (resettable) & lamp usage hours (non-resettable)
10. The unit should have Smooth Height adjustment mechanism
11. Should have smooth light unit tilting mechanism
12. Minimum height should be approximately 1100 mm from the floor to use near the mother bed
13. Maximum height should be approximately 1600 mm from the floor to use with the incubator
14. Electric supply: Universal Power supply 100V - 240V AC, 50Hz to 60Hz with a power rating of 25W (Max)
15. Coating: Epoxy/powder coated body for scratch and rust prevention and PU (Poly Urethane) coating for plastic
16. Mobility: Three castors; two rear castors provided with brakes
17. The base of the unit should be such that it will go beneath any Incubator/bed/trolley, with minimum of 100 mm floor clearance
18. Lamp source should be continuous tiltable to (plus / minus) 45-degree angle to cover the entire treatment area. (ie Light intensity (average) from blue LED's should be consistent across the treatment footprint at any angle of head tilt)
19. Should be equipped with white light for the observation purpose
20. Should consists of backlit LCD
21. Should have coverage of maximum surface area at any angle is 1800 sq-mm.
22. Should have slim sleek look for less space consumption and can be easily combined with other NICU equipment (Warmer / Incubator).
23. Device should be EMC certified as per IEC 60601-1-2 standard
24. The manufacturer should be ISO 13485 certified
25. Should be USFDA/European CE certified from notified body

  
 Dr. Krishna Kumar Yadav  
 PhD, FIMSA  
 (e), Pediatrics  
 Wednesday  
 Profes-

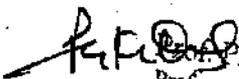
  
 Dr. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## Double Surface Led Phototherapy Unit

The specification for top unit should confirm to the following:

1. Light unit should be made of easily cleanable plastic material
2. It should have fan less technology
3. Should consist of 9 blue LEDs or more for treatment and 2 white LEDs for observation at top light unit, and 12 blue LEDs at bottom phototherapy
4. Life time of the LED's should be more than 1 lakh hours
5. Spectral Irradiance of minimum  $35 - 45 \mu W \cdot cm^{-2} \cdot nm^{-1}$  at 45 cm distance between bed and light unit
6. Wavelength: between 445 - 470 nm, and should be free from UV and IR radiation.
7. Effective surface area should be at least 250 x 500 mm within an irradiance ratio of 0.4 (min/max irradiance)
8. Should have adjustable Light Intensity (high / low settings)
9. Digital Timer for monitoring therapy hours (resettable) & lamp usage hours (non-resettable)
10. The unit should have Smooth Height adjustment mechanism
11. Should have smooth light unit tilting mechanism
12. Minimum height should be approximately 1100 mm from the floor to use near the mother bed
13. Maximum height should be approximately 1600 mm from the floor to use with the incubator
14. Electric supply: Universal Power supply 100V - 240V AC, 50Hz to 60Hz with a power rating of 25W (Max)
15. Coating: Epoxy/powder coated body for scratch and rust prevention and PU (Poly Urethane) coating for plastic
16. Mobility: Three castors; two rear castors provided with brakes
17. The base of the unit should be such that it will go beneath any Incubator/bed/trolley, with minimum of 100 mm floor clearance
18. Lamp source should be continuous tiltable to (plus / minus) 45-degree angle to cover the entire treatment area. (ie Light intensity (average) from blue LED's should be consistent across the treatment footprint at any angle of head tilt)
19. Should be equipped with white light for the observation purpose
20. Should consists of backlit LCD

  
 Dr. Krishna Kumar Yadav  
 MD, PhD, FIMSA  
 (Specialist), Pediatrics  
 Professor (J. P. D.)  
 Wednesday

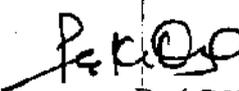
  
 Dr. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLMS, Lucknow

21. Should have coverage of maximum surface area at any angle is 1800 sq-mm  
 22. Should have slim sleek look for less space consumption and can be easily combined with other NICU equipment (Warmer / Incubator)

The specification for bottom unit should confirm to the following:

23. Irradiance : > 30W/cm<sup>2</sup>/nm at 230V at infant bed  
 24. Lamp Type : LED's  
 25. Electric supply : 110-230V, 50 Hz, 2 A.  
 26. Power rating : Maximum - 25 W  
 27. Time totalizer : Non-resettable Total therapy time  
 28. Bassinet dimensions : Maximum of 78 cm x 52 cm x 15 cm  
 29. Bassinet tilting : ±12°  
 30. Weight of lamp unit : Less than 25 kg  
 31. Bassinet : Transparent acrylic bassinet  
 32. Coating : Epoxy/powder coated body for scratch resistance and rust  
 Protection should conform to IEC-60601 safety standards  
 33. Should occupy only very little bedside space for convenience in observation and procedures  
 34. Should have Trendelenburg positioning  
 35. The unit should be mobile with 4 swivel castors (2 No's. with brake and 2 No's. without brake)  
 36. 10 Nos. Eye masks should be supplied with the equipment  
 37. Device should be EMC certified as per IEC 60601-1-2 standard  
 38. The manufacturer should be ISO 13485 certified  
 39. Should be USFDA/ European CE certified from notified body

  
 Dr. Krishna Kumar Yadav  
 MD PhD, FIMSA  
 Professor (Jr. Grade), Pediatrics  
 OPD - Wednesday

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## Advanced Bilirubinometer

S.No.	Technical Specification
01	Non-invasive Screening device that provides a fast (on-spot) measurement of total serum bilirubin transcutaneously in neonates with a gestational age >24 weeks
02	Hand-held device for outpatient/inpatient usage which is of Pocket size
03	Shouldn't use any consumables (In case consumables are present, same to be included at no extra charge for 3000 measurements)
04	Should have a reusable measuring probe which can be disinfected by wiping
05	Detectors – Silicon photodiodes
06	Should be light weight not more than 2100 gm with integrated rechargeable battery
07	Should be capable of doing at least 400 measurements on a full charge. Battery should be easily rechargeable (2hrs)
08	Accuracy should be within $\pm 1.5\text{mg/dL}$
09	Should have a choice of taking readings, between single, 2-5 measurements as an average
10	Should have an internal memory backup of at least 100 readings
11	Should have connectivity for electronic medical record (EMR) for data transfer
12	Should have large touch screen display for easy readout, should also display the date on which reading is taken
13	Display should show bilirubin in mg/dl units with at least 1 decimal point (resolution 0.1 mg/dL or lower)
14	Should have charging station to check calibration on light wavelength
15	Should work well with all skin colors
16	Measuring range 0.0 mg/dL to 20 mg/dL or 0 – 340 $\mu\text{mol/L}$
17	Machine should be ready in less than 30 seconds from cold start
18	Calibration between patients should not be required
19	Scope of supply: 1. Bilirubinometer 2. Charging unit with calibration checker 3. Instructions for use
20	Should have US FDA approved

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Dr. Krishna Kumar Yadav  
 M.D., Ph.D., FIMSA  
 Professor (Sr. Grade), Pediatrics  
 O.D. - Wednesday

## TRANSCUTANEOUS BILIRUBINOMETER

1. Non-Invasive Transcutaneous Bilirubin Meter
2. Total Serum Bilirubin Range: 0-20mg/dL, 0-340 mol/L
3. Correlation:  $r=0.90$
4. Accuracy:  $\pm 1.5$  mg/dL
5. Hand Held Unit
  - Weight (including battery pack): less than 200g
  - Barcode Reader: Yes
6. Battery Pack:
  - Type: Lithium ion
  - Measurements per Full Charge: 250 (minimum)
7. Light Source:
  - Type: Green and Blue LEDs
  - Life: >2,00,000 measurements
8. Power Supply:
  - Input: 100-240VAC, 50/60 Hz, 150mA
9. Connectivity:
  - Connectivity to PC: USB connection
  - Connectivity to HIS: HL7 protocol via PC
10. Do not require any consumables (Sample Tips for measurements), hence running expenses is NIL
11. Displays the results in Tables and Graphs. These may be printed & exported.
12. Less sensitive to motion artifacts & measurement differences based on user technique.
13. LEDs do not deteriorate over time eliminating the requirement for routine device calibration
14. Can be used with or without entering baby's ID
15. Large & clear display for easy use
16. Memory up to 100 measurements saves time in transcribing and comparing results.
17. Option to enter both patient and user identification facilitates hospital audits and quality assurance.
18. Barcode scanner for quick and accurate entry of caregiver and baby identification.
19. LEDs do not require routine calibration, minimizing maintenance and cost associated with service
20. Ambulatory Mode for outpatient clinic
21. System to be password protective to avoid non-approved user to change the setting of the device
22. The system has US-FDA or European CE (Notified Body) approved

*K.K.*  
 Dr. Krishna Kumar Yadav  
 MD, PhD, FIMSA  
 Professor, Pediatrics  
 Wednesday

*P.K.D.*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## Radiant Baby Warmer with Resuscitation

### Intended use in NICUs

1. Quartz based open care warmer with Servo and manual mode of operation.
2. Should operate for infant required temperature range (servo) of 32° C to 37° C override up to 38° C
3. Heater power should be reduced and maintain at 60% after 10 minutes in manual mode for baby safety
4. Heater output control range (manual) -0 to 100% incremental of 5%
5. Should have minimum 7inch touch screen display with the facility of trending temperature
6. Control unit should have facility to convert Centigrade to Fahrenheit conversion
7. Should have non touch sensor based dual examination lamp with dimming facility
8. The heater unit should be swivable for accommodating X-Ray unit and should have self-lock facility
9. Should have provision to take X rays with the help of portable machine without shifting the baby
10. Should have an oval shaped bed for greater accessibility and without crevices for ease in cleaning
11. Should have a firm antibacterial, Fire-retardant mattress which allows air to pass through but does not allow water to seep in
12. The bed should be tilted to Trendlenburg and Fowler like position.
13. Should have continuous variable bed tilting mechanism for a bed tilt between  $\pm 12$  degree, using Gas spring mechanism.
14. Bed should have an x-ray cassette holder that can be accessed without disturbing the infant
15. Bed should be swivable on both sides of vertical column of  $\pm 60$  degree to facilitate incubation/ resuscitation etc.
16. Should have inbuilt pulse oximeter set technology
17. Bed height adjustment: Should have motorized variable height adjustment mechanism to vary the unit height from 187 cm to 217 cm from the ground and cradle/baby bed height should be 84 cm to 114 cm from the ground level
18. Should be able to adjust height of the bed by foot switch operated mechanism from either side of the bed
19. Should have inbuilt baby weighing scale with load capacity of 10 Kg(max) and accuracy 10gm
20. Should have a strong IV stand (S.S.) with height adjustable and facility to fix large number of infusion pumps, Mayo tray-2 No's on the same side
21. The unit should be mobile with four 5 inches swivable castors all with locking facility
22. All metal parts of the equipment should be corrosion resistant and Epoxy/Powder coated.
23. Should have alarms: High Infant Temperature, Low Infant temperature, SPO2 and heart rate alarm, BPM- High & Low alarms, measured oxygen level in infant's blood -high & low alarms, Probe failure, Heater failure, Power failure, System failure, Low battery
24. Should have visual indicator for alarms on the heater unit
25. Should be worked in 230V ( $\pm 10\%$ ) 50Hz
26. Should have maximum power consumption of 900w.
27. Should be provided with dual temperature probe to measure skin temperature and peripheral temperature

### SKIN TEMPERATURE PROBE SPECIFICATION

Display Range - 26.4 °C to 40 °C

Accuracy -  $\pm 0.2$  °C

Resolution - 0.1 °C

Probe Interchangeability -  $\pm 0.2$  °C

*Kep*  
 Dr. Krishna Kumar Yadav  
 Professor, FIMSA  
 Pediatrics  
 sdnoday

*P.K. Das*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

28. Should have inbuilt **electronic Resuscitation Unit** with the specifications as follows:
- O<sub>2</sub> concentration: 21% - 100 %
  - Oxygen inlet pressure: 3bar - 6 bar
  - Air inlet pressure: 3 bar - 6 bar
  - Oxygen flow rate control: 0 - 8 LPM
  - Breathing rate control: Manual
  - Maximum airway pressure: 60 cm H<sub>2</sub>O
  - Adjustable airway pressure: 10 - 35 mm H<sub>2</sub>O
  - Airway pressure gauge: 0 - 100 cm H<sub>2</sub>O
29. Should have inbuilt **CPAP Unit** with the specifications as follows:
- O<sub>2</sub> concentration: 21% - 100 %
  - Oxygen inlet pressure: 3bar - 6 bar
  - Air inlet pressure: 3 bar - 6 bar
  - Inbuilt electronic Air and O<sub>2</sub> Blender
  - Patient should always be open to the atmosphere and the resistance (PEEP) should be generated by flow.
30. **SUCTION CONTROL** with the below specification:
- Suction range - 0 - 250 mm Hg
  - Vacuum Gauge range - 0 - 760 mm Hg
31. Should have an inbuilt Apgar timer with count up time
32. Should have Swivel trays under the bed to place the baby belongings.
33. Coating should be Epoxy/Powder coating for scratch resistance and rust protection.
34. Should confirm to IEC -60601-1, IEC -60601-1-2, IEC -60601-2-21 electrical safety.
35. Should be supplied by an ISO 13485 certified manufacturer
36. Should be USFDA/ European CE Certified notified body

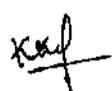
*K.K.P.*  
 Dr. Krishna Kumar Yadav  
 MD, PhD, FIMSA  
 Professor (Jr Grade), Pediatrics  
 OPD - Wednesday

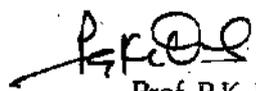
*P.K.D.*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## Advanced Open Care Warmer with Resuscitation

Intended use: Tertiary care and state of art NICUs

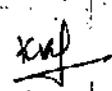
- A radiant heater with designed reflector to provide uniform heating to cover the entire baby mattress to keep baby warm, while keeping care giver confirmable and cool
- It should have inverted hourglass type heat profile to keep babies warm and care giver cool, keeping the care giver comfortable over long procedural interventions
- Advanced technology with gold plated dish heater ensures high average irradiance of 27 milliwatt/cm<sup>2</sup> even using 360-watt heater, that helps in reducing of IV fluid intake
- A pressure diffusing mattress that can move, or translate, from inside infants' compartment to outside infant compartment and can rotate about an axis to provide 360-degree rotations
- It should have continued, fast and accurate heart rate assessment
- Time to display of heart rate should be  $\leq 6$  seconds
- It should have capabilities of 3 lead ECG for heart rate
- It should have facility for APGAR
- The resuscitation system should include Venturi suction device, medical gas flowmeter, Airway pressure manometer, Peak Inspiratory pressure control valve and Air /Oxygen Blender
- It should have facility for resuscitation with t-piece resuscitation and inbuilt blender
- Hands free silence alarm reduces need to move outside of sterile environment during procedure to maintain sterility
- Aim able procedure light of 2000 Lux intensity makes procedure during surgery and post-surgery easy
- Recessed heater design allows Xray procedure without compromising thermoregulation
- Radiolucent mattress and X tray enables to complete X-Ray procedure without touching baby, helps avoiding unwanted negative touch, reduces chance of infection
- Motorized height adjustment and inbuilt weighing scale along with trends facility to understand the growth of baby
- 12-degree smooth tilting facility with bubble level indicator
- It should have an Integrated control and Display system with Trending for control settings, thermal parameters, ECG Display, SPO<sub>2</sub> and Heart Rate etc
- It should have Patient temperature measurement accuracy of  $\pm 0.3$  degree Celsius between 30-40 degree celsius
- It should have a movable drawer from both sides for extra leg space to support Kangaroo Care
- It should use heat engine with less than 375-watt power consumption while maintaining desired heat with uniformity. The heater should have lifetime warranty
- It should have Warm up time  $< 3$  minutes with 100% Power
- Temperature in Patient Control (Baby) Mode: 34°C to 37.5°C in increments of 0.1°C

  
Dr. Krishna Kumar Yadav  
MD, FIMSA  
Professor, Pediatrics  
vcculmesday

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

- Temperature Measurement Accuracy:  $\pm 0.3^{\circ}\text{C}$  with Resolution:  $\pm 0.1^{\circ}\text{C}$
- Probe Accuracy:  $\pm 0.1^{\circ}\text{C}$  within range of Range:  $30-42^{\circ}\text{C}$
- It should have Aim able procedure Light with intensity of 2000 Lux
- It should have Dimmable Examination Light
- It should have 6.5-inch color display with Temperature Trending facility
- It should have +/- 12-degree continuous dampened tilt with Bubble level indicator for jerk free accurate tilting for critical babies
- Bassinet with all 4 side Removable side panels to give total accessibility to baby
- It should have Twin Thermistor probes to improve accuracy of temperature readings.
- It should have movable drawer
- It should have facility to change the height of Bed to Floor for at least 4 positions by press of paddle
- It should have dovetail side rail system for flexible mounting of accessories as per convenience of clinicians
- It should be supplied with Drawer, X Ray tray, Reusable probe, Dimmable examination light, Aimable procedure light, Pressure diffusing mattress, IV Pole, Monitor shelf
- It should comply IEC - 60601-1 for electrical safety
- The equipment must be US FDA approved

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Dr. Krishna Kumar Yadav  
 MD, PhD, FIMSA  
 Professor (Jr. Grade) Pediatrics  
 OPD - Wednesday

# High End Open Care Radiant Baby Warmer (with Resuscitation and CPAP)

## Intended use in NICUs

1. Quartz based open care warmer with Servo and manual mode of operation.
2. Should operate for infant required temperature range (servo) of 32° C to 37° C override up to 38° C
3. Heater power should be reduced and maintain at 60% after 10 minutes in manual mode for baby safety
4. Heater output control range (manual) -0 to 100% incremental of 5%
5. Should have minimum 7inch touch screen display with the facility of trending temperature
6. Control unit should have facility to convert Centigrade to Fahrenheit conversion
7. Should have non touch sensor based dual examination lamp with dimming facility
8. The heater unit should be swivable for accommodating X-Ray unit and should have self-lock facility
9. Should have provision to take X rays with the help of portable machine without shifting the baby
10. Should have an oval shaped bed for greater accessibility and without crevices for ease in cleaning
11. Should have a firm antibacterial, Fire-retardant mattress which allows air to pass through but does not allow water to seep in
12. The bed should be tilted to Trendlenburg and Fowler like position
13. Should have continuous variable bed tilting mechanism for a bed tilt between  $\pm 12$  degree, using Gas spring mechanism.
14. Bed should have an x-ray cassette holder that can be accessed without disturbing the infant
15. Bed should be swivable on both sides of vertical column of  $\pm 60$  degree to facilitate incubation/resuscitation etc.
16. Should have inbuilt pulse oximeter set technology
17. Bed height adjustment: Should have motorized variable height adjustment mechanism to vary the unit height from 187 cm to 217 cm from the ground and cradle/baby bed height should be 84 cm to 114 cm from the ground level
18. Should be able to adjust height of the bed by foot switch operated mechanism from either side of the bed
19. Should have inbuilt baby weighing scale with load capacity of 10 Kg(max) and accuracy 10gm
20. Should have a strong IV stand (S.S) with height adjustable and facility to fix large number of infusion pumps, Mayo tray-2 No's on the same side
21. The unit should be mobile with four 5 inches swivable castors all with locking facility
22. All metal parts of the equipment should be corrosion resistant and Epoxy/Powder coated.
23. Should have alarms: High Infant Temperature, Low Infant temperature, SPO2 and heart rate alarm, BPM- High & Low alarms, measured oxygen level in infant's blood -high & low alarms, Probe failure, Heater failure, Power failure, System failure, Low battery
24. Should have visual indicator for alarms on the heater unit
25. Should be worked in 230V ( $\pm 10\%$ ) 50Hz
26. Should have maximum power consumption of 900w.
27. Should be provided with dual temperature probe to measure skin temperature and peripheral temperature

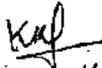
### SKIN TEMPERATURE PROBE SPECIFICATION

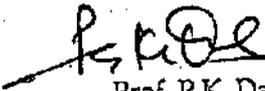
Display Range - 26.4 °C to 40 °C

Accuracy -  $\pm 0.2$  °C

Resolution - 0.1 °C

Probe Interchangeability -  $\pm 0.2$  °C

  
Dr. Krishna Kumar Yadav  
MD, PhD, FIMSA  
Professor (Jr. Assoc), Pediatrics  
OPD - Wednesday

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

28. Should have inbuilt **electronic Resuscitation Unit** with the specifications as follows:
- O<sub>2</sub> concentration: 21% - 100 %
  - Oxygen inlet pressure: 3bar - 6 bar
  - Air inlet pressure: 3 bar - 6 bar
  - Oxygen flow rate control: 0 - 8 LPM
  - Breathing rate control: Manual
  - Maximum airway pressure: 60 cm H<sub>2</sub>O
  - Adjustable airway pressure: 10 - 35 mm H<sub>2</sub>O
  - Airway pressure gauge: 0 - 100 cm H<sub>2</sub>O
29. Should have inbuilt **CPAP Unit** with the specifications as follows:
- O<sub>2</sub> concentration: 21% - 100 %
  - Oxygen inlet pressure: 3bar - 6 bar
  - Air inlet pressure: 3 bar - 6 bar
  - Inbuilt electronic Air and O<sub>2</sub> Blender
  - Patient should always be open to the atmosphere and the resistance (PEEP) should be generated by flow.
30. **SUCTION CONTROL** with the below specification:
- Suction range - 0 - 250 mm Hg
  - Vacuum Gauge range - 0 - 760 mm Hg
31. Should have an inbuilt Apgar timer with count up time
32. Should have Swivel trays under the bed to place the baby belongings.
33. Coating should be Epoxy/Powder coating for scratch resistance and rust protection.
34. Should confirm to IEC -60601-1, IEC -60601-1-2, IEC -60601-2-21 electrical safety.
35. Should be supplied by an ISO 13485 certified manufacturer
36. Should be USFDA/ European CE Certified notified body

  
 Dr. Krishna Kumar Yadav  
 MD, PhD, FIMSA  
 Professor (Jr. Grade), Pediatrics  
 OPD : Wednesday

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

# Basic OPEN CARE RADIANT WARMER

Intended use in SNCUs

1. Quartz based open care warmer with Servo and manual mode of operation
2. Should operate for infant required temperature range (servo) of 32° C to 37° C override up to 39°C
3. Heater power should be reduced and maintain at 60% after 10 minutes in manual mode for baby safety
4. Heater output control range (manual) -0 to 100% incremental of 10%
5. Should have minimum 7inch touch screen display with the facility of trending temperature
6. Control unit should have facility to convert Centigrade to Fahrenheit conversion
7. Should have non touch sensor based dual examination lamp with dimming facility
8. The heater unit should be swivable for accommodating X-Ray unit and should have self-lock facility
9. Should have provision to take X rays with the help of portable machine without shifting the baby
10. Should have an oval shaped bed for greater accessibility and without crevices for ease in cleaning
11. Should have a firm antibacterial, Fire-retardant mattress which allows air to pass through but does not allow water to seep in
12. The bed should be tilted to Trendlenburg and Fowler like position
13. Should have continuous variable bed tilting mechanism for a bed tilt between  $\pm 12$  degree, using Gas spring mechanism
14. Bed should have an x-ray cassette holder that can be accessed without disturbing the infant
15. Bed should be swivable on both sides of vertical column of  $\pm 60$  degrees to facilitate intubation/resuscitation etc
16. Bed height adjustment: Should have motorized variable height adjustment mechanism to vary the unit height from 182 cm to 212 cm from the ground and cradle/baby bed height should be 84 cm to 114 cm from the ground level
17. Should be able to adjust height of the bed by foot switch operated mechanism from either side of the bed
18. Should have inbuilt baby weighing scale with load capacity of 10 Kg(max) and accuracy 10gm
19. Should have a strong IV stand (S.S.) with height adjustable and facility to fix large number of infusion pumps, Mayo tray-2 No's on the same side
20. The unit should be mobile with four 5 inches swivable castors all with locking facility
21. All metal parts of the equipment should be corrosion resistant and Epoxy/Powder coated
22. Should have alarms: High Infant Temperature, Low Infant temperature, Probe failure, Heater failure, Power failure, System failure, Low battery
23. Should have visual indicator for alarms on the heater unit
24. Should be worked in 230V ( $\pm 10\%$ ) 50Hz
25. Should have maximum power consumption of 900w
26. Should be provided with dual temperature probe to measure skin temperature and peripheral temperature

## SKIN TEMPERATURE PROBE SPECIFICATION

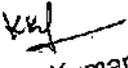
Display Range - 26.4 °C to 40 °C

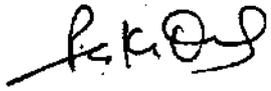
Accuracy -  $\pm 0.2$  °C

Resolution - 0.1 °C

Probe Interchangeability -  $\pm 0.2$  °C

27. Should have Swivel trays under the bed to place the baby belongings
28. Coating should be Epoxy/Powder coating for scratch resistance and rust protection
29. Electronic Resuscitation Unit, CPAP Unit, SUCTION CONTROL and Inbuilt pulse oxy-meter Masimo Technology should be upgradable
30. Should conform to IEC -60601-1, IEC -60601-1-2, IEC -60601-2-21 electrical safety standard for medical equipment
31. Should be supplied by an ISO 13485 certified manufacturer
32. Should be USFDA/European CE Certified from notified body

  
Dr. Krishna Kumar Yadav  
MD PhD, FIMSA  
Professor (Jr. Grade) Pediatrics  
OPD :- Wednesday

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**Physical  
Medicine &  
Rehabilitation  
(PMR)**

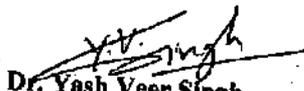


**Resolution Certificate about Technical Specifications  
related to Department of PMR by committee  
members**

SR. NO.	NAME OF EQUIPMENT	GO NUMBER	APPROX. COST
1.	IR CAMERA BASED GAIT AND FOOT PRESSURE STUDIES LAB WITH ACCESSORIES		4 CRORE
2.	SHORTWAVE DIATHERMY UNIT		10 LACS

This is to certify that technical specification of all the above-mentioned machine/instruments, approved by the technical committee is not of any specific company. The technical features of the equipment/instruments from all reputed firms in the current market have been included in this specification to the best of my knowledge and belief & in the opinion of the technical committee.

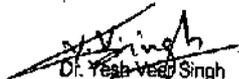
The technical specification duly signed by the technical committee members is attached herewith.

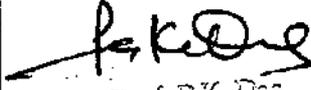
  
**Dr. Yash Veer Singh**  
Associate Professor  
Department of PMR  
DR RMLIMS, Lucknow

  
**Prof. P.K. Das**  
Chairman  
Technical specifications committee  
Clinical Subjects & others  
Head, Department of Anesthesiology & CCM  
DR RMLIMS, Lucknow

## IR CAMERA BASED GAIT AND FOOT PRESSURE STUDIES LAB WITH ACCESSORIES

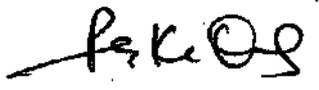
COMPONENT SYSTEMS	
<b>A.</b>	<b>IR Camera system to acquire Gait &amp; Motion Analysis</b>
1	No. of IR Cameras: 8 (Eight).
2	Should be expandable up to 16 digital cameras.
3	Gigabit Ethernet communication.
4	Type of Camera: Infrared cameras.
5	Cameras should operate at 300 - 340Hz with full resolution.
6	Strobes should emit light by wavelength in a bandwidth around 650 nm.
7	Camera resolution: Minimum 2048 x 1088 Pixel or higher.
8	Maximum acquisition frequency up to 2000 fps.
9	Marker detection system.
10	Processing: On Camera.
11	Camera Power: Directly supplied by the Data Station.
12	Set of whole-body markers, which should be upgradeable, 100 Nos. of Extra markers to be supplied along with the System.
13	System must be able to acquire complex movements in both indoor and outdoor conditions.
14	System should be able to capture the marker trajectory (Unlimited number of markers).
15	System should be supplied with markers to capture both upper limb and lower limb bilaterally.
16	System should be supplied with markers suitable for both paediatric as well as adult population.
17	Necessary calibration apparatus. Bar based calibration for a fast system set up even with obstacles in the field of view, 6 Tripod and 6 wall mounts, cable and all other necessary accessories to be supplied along with the system.
18	System should be supplied with an independent spatial-temporal gait parameters evaluation device for scrutiny of the subjects/ patterns with the following features:
	a. System to be placed around the waist by an ergonomically designed belt.
	b. System should be able to analyse speed, acceleration pattern and pelvic angles.
	c. System should include various types of tests, viz. walking test, timed up and go, turning test, 6 minutes walking test indoor running test.
	d. The software of the system should evaluate the following spatio-temporal parameters speed, cadence, step length, stride length, gait cycle duration, stance duration, swing duration, single and double support phase duration.
	e. Should evaluate the following pelvic gridle angle parameters viz. anterior posterior rotations, anti-retroversion, lateral tilt (up/down), transversal rotations (internal/external).
	f. Sensor Typology: Tri-axial accelerometers, Multiple Tri-axial gyroscopes, Magnetometer, GPS.
	g. Connectivity: Bluetooth, Frequency: up to 200 Hz, Battery: rechargeable via USB.
	h. Should have internal memory.
<b>B.</b>	<b>Foot Pressure Studies</b>
1	The system should have stand - alone platform for Stance and Roll-Off analysis.
2	The system should be connected to an USB PC/Notebook interface.
3	It should have more than 2500 capacitive sensors. The measuring system should function using high-quality capacitive force sensors that are arranged in matrix and each sensor should

  
 Dr. Yash Vard Singh  
 Associate Professor, PMR  
 Dr. RMLIMS, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

	produce its own calibration curve.
4	It should have minimum sensing area (180-200) cm x (70-75) cm x (8-8) cm (L x B x H).
5	It should have Sampling rate: 300 Hz or more.
6	Calibration: Automatic 10 bit or more.
7	Sensors Dimensions: 1cm x 1 cm or less.
8	It should have video out sync interface.
9	The measuring plate should enable the static and dynamic pressure distribution to be analysed under the feet while standing and walking. The system is connected directly to a commercially available PC via USB interface and should not require any additional electronics.
10	The gait parameters are displayed in the evaluation report. These should include amongst others the step length and step width, the stance, swing and double stance phase as well as the cadence.
11	It should allow for the display of static posture during a standard examination.
12	It should have software for data collection, analysis, static load distribution analysis, basic function equilibrium analysis, roll-off analysis and for coordination training.
13	The system should provide optional Bluetooth telemetry EMG for muscle function to analyse forces parallel to the ground reaction forces.
<b>C.</b>	<b>Force Platforms: 4 Nos.</b>
1	Sensing area 800 mm x 600 mm.
2	Should be able to acquire static and dynamic forces in x, y, z axes.
3	Digital output via Ethernet.
4	Self-calibration of platform position.
5	Force platforms should work on strain gauge technology.
6	Integratable software with kinematic and EMG data.
7	Platform should have the facility of measurement in real time the ground reaction forces overlaid on the video shot of the moving patient.
8	Upgradability to unlimited number of platforms in future if required.
<b>D.</b>	<b>Software Features</b>
1	To integrate, analyse, store, reproduce and report 3D Gait & Motion analysis, video picture, kinematic, kinetic (force plate) and EMG data in the same control system. Simultaneous visualization of all the above data in graphs. Long duration motion captures facility.
2	Free software updates mandatory.
3	Real time visualization of all integrated devices data.
4	Immediate upload of data to workstation and storage.
5	Easy drag and drop data processing software package for protocol creation, without any programming language knowledge.
6	To differentiate stance phase and swing phase kinematics, kinetics, EMG. Display of full perspective 3D representation of workspace, markers and trajectories (mouse controllable).
7	Auto 3D reconstruction of marker trajectories.
<b>E.</b>	<b>Surface EMG system (16 wireless EMG channel)</b>
	<b>Wireless probes:</b>
1	Should be surface electrodes: variable geometry electrodes with mounting clip 16 bit resolution-acquisition frequency up to 4000 Hz
2	Data transmission should be wireless (probes-receiving unit)
3	Probes- receiving unit up to 50 metres (160 feet) in free space

  
 Associate Professor, PMR  
 Dr. RMLIMS, Lucknow

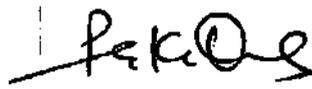
  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

4	Memory on-board solid-state buffer memory system
5	Weight <10 grams, including battery and satellite electrode identification labels
	<b>Mobile receiving unit</b>
1	EMG channels up to 16 wireless probes on each receiving unit
2	Data transmission wireless WiFi (receiving unit- workstation)
3	Display 4" VGA touch screen
4	Recording duration upto 9 hours with a single battery
5	Range receiving unit- workstation up to 30 metres (100 feet) indoor- up to 360 metres (360 yards) outdoor.
6	Weight 325 to 375 grams.
<b>F.</b>	<b>System Necessities</b>
1	IR Camera System should be supplied, installed on site with all necessary accessories, and sufficient consumables.
2	Installation shall include 2 weeks of training and supervised practice for department personnel.
3	Service backup with response time of 24 hours.
	Letter of quality of performance to be furnished from reputed institutions (3 Nos.), preferably under central or any state govt, using this system in India.
	Acceptance and compliance with the above specifications are required from the parent manufacturing company.
	The full System should be quoted as a full single package of one Manufacturer as designed for the present site.
	Workstation (i7 latest generation) with Monitor, multifunction color laser printer, UPS, DVD Writer, High Speed RAM.
<b>G.</b>	<b>Turnkey Solution</b>
	<b>Civil work:</b> Necessary Civil work has to be done by the supplier/bidders to fulfill the installation requirements of IR Camera, Force Plate, EMG System, Video Camera and Foot Pressure System
1	Installation of the force plates by merging with the floor/ raised walkway as per the installation site condition.
2	A stabilized power source, including online UPS of suitable rating with minimum 1 hour backup for the PC/ peripherals.
3	Basic electrical work to be done like plugs, cable housing etc.
4	Human height measuring devices – digital.
5	Human body weight measuring devices – digital.
6	Vinyl flooring of the walkway/ramp
7	Blinds for windows and doors.
8	LCD Display of approx. 60 inches
9	2 Nos. of split A/C each of 1.5 ton
10	If any other civil work is required should be listed separately by the supplier/bidders.

**Certifications:**

The whole system should be European CE/US FDA approved.

  
 Dr. Yesh Veer Singh  
 Associate Professor, PMR  
 Dr. RMLIMS, Lucknow



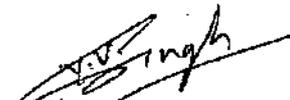
Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## SHORTWAVE DIATHERMY UNIT

1. Microprocessor based Continuous and Pulsed Shortwave Diathermy Unit for superficial and deep tissue treatment.
2. Operating Frequency: 27.12 MHz
3. Operation modes: Capacitive, Resistive and Inductive
4. Emission modes: Continuous and pulsed
5. Continuous Output: 450 W to 470 W
6. Pulsed Output: 1050 W to 1100 W
7. Automatic Tuning
8. Frequency: 20 to 200 Hz
9. Impulse length: 400 to 450 micro-seconds
10. Display: LCD
11. The unit should offer minimum 20 pre-set therapeutic protocols for common conditions.
12. The unit should be supplied complete with disc electrodes (2 Nos), rubber electrodes (4 Nos), felt spacers (4 Nos), high frequency cables (4 Nos), and electrode arms (2 Nos).
13. System should work on 220V-230V/50Hz.
14. Should be supplied with Servo Voltage Stabilizer of required rating
15. Wooden couch with mattress.

### Conditions for tender:

1. Instruments must be ISO certified and copy should be enclosed. (The ISO Certificate must be issued by any organization accredited by Bureau of Indian Standard or accredited by international accrediting forum "IAF" (Certificate to be attached).
2. The equipment should be USA FDA/ European CE (from a Four Digit notified body) approved.

  
 Dr. Yesh Veer Singh  
 Associate Professor, PMR  
 Dr. RMLIMS, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

# **Pulmonary Medicine**

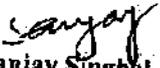


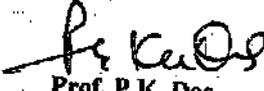
MEMORANDUM ABOUT technical Specifications  
related to Department of Pulmonary Medicine by  
committee members

SR. NO.	NAME OF EQUIPMENT	GO NUMBER	APPROX.C OST
1.	BASIC BRONCHOSCOPE SYSTEM	GO-28-DEC-17 SUCHI-1	35 LACS
	ADVANCED BRONCHOSCOPE SYSTEM	GO-23-AUG-18 SUCHI-4	55-60 LACS
	FIBER OPTIC BRONCHOSCOPE (PEADIATRIC)	GO-7-DEC-2022	45 LACS
	FIBER OPTIC BRONCHOSCOPE (ADULT)	GO-28-DEC-17 SUCHI-1 GO-7-DEC-2022	45 LACS
2.	BASIC BRONCHOSCOPY SYSTEM (CRYO SYSTEM PULMUNOLOGY BRONCOSCOPY)	GO-7-DEC-2022	30 LACS
	ADVANCED BRONCHOSCOPY SYSTEM (CRYO SYSTEM PULMUNOLOGY BRONCOSCOPY)		1 CR
3.	BASIC SLEEP LAB SYSTEM(DIGITAL VIDEO POLYSOMNOGRAPHY SYSTEM)	GO-7-DEC-2022	35 LACS
	HIGH END SLEEP LAB SYSTEM(DIGITAL VIDEO POLYSOMNOGRAPHY SYSTEM)		45 LACS
4.	IMPULSE OSCILLOMETRY SYSTEM (IOS) WITH PSG, DIFFUSION STUDY, FOT	GO-7-DEC-2022	75 LACS
5.	COPE PLEURAL BIOPSY NEEDLE	GO-28-JAN-18 SUCHI-2	3000/-

This is to certify that technical specification of all the above-mentioned machine/instruments, approved by the technical committee is not of any specific company. The technical features of the equipment/instruments from all reputed firms in the current market have been included in this specification to the best of my knowledge and belief & in the opinion of the technical committee.

The technical specification duly signed by the technical committee members is attached herewith.

  
Dr. Sanjay Singh  
Associate Professor  
Department of Pulmonary Medicine  
DR RMLIMS, Lucknow

  
Prof. P.K. Das  
Chairman  
Technical specifications committee  
Clinical Subjects & others  
Head, Department of Anesthesiology & CCM  
DR RMLIMS, Lucknow

## Basic Bronchoscope System

### Monitor

- Screen 8 to 12 inch in size for display with touch screen to control features with HDMI output for connecting to a big screen which can display picture simultaneously on both screens.
- Monitor should have two ports to connect two video scopes (VL & Flexible scope) at one time and picture can be swapped using touch screen.
- Monitor should be chargeable, to be supplied with charger and should have facility to be used while charging.
- Monitor resolution should be minimum 1920 X 1200 pixels in 16:9 format.
- Integrated recording of Audio, Video and Still images should be possible on data card or USB drive with JPEG, MPEG, MP4 format which can be easily transferred to the computer/laptop. Documented videos & still images should be easily recalled/Playback on the monitor.
- Monitor Should have a facility to connect flexible video scopes (reusable & single-use) directly without any special coupler or accessory.
- Monitor should have Picture-in-Picture & side-by-side mode to view images from 2 different video scopes attached (video laryngoscope blades and flexible video scopes).
- Monitor should be splash proof according to IP 54 and should be shock resistant.
- Same Monitor should be compatible with all the below mentioned scopes of same manufacturing principal company-
  - Reusable video laryngoscope
  - Single use video laryngoscope
  - Reusable Flexible Intubation video endoscope
  - Single use Flexible Intubation video endoscope
  - Video Intubation endoscope with flexible tip

### Flexible Intubation Video Endoscope - Adult

- It should be light weight, high resolution & portable flexible scope.
- Integrated camera chip and LED light illumination
- ET TUBE HOLDER should be a part of standard accessory of flexible scope and should be from same manufacturer.
- There should be 5cm interval markings on the scope.
- Set should include- Suction Adaptors (Disposable), Cleaning brush & Leakage tester as standard accessories along with carrying case

*sanjay*

डॉ० (विजय) संजय सिंघा  
MD, EDRM, FCCP, FRII  
Associate Professor  
Pulmonary Medicine  
RMLIMS, Lucknow

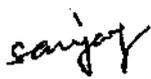
*P.K. Das*

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

- Scope should be suitable for the following applications-
- Endotracheal Intubation
- Bronchoscopy
- Foreign body removal
- Bronchial Lavage
- Inspection of the Airways
- Dilatation Tracheotomy
- Technical Details of Flexible Video Endoscope-
- Tip deflection UP/DOWN: 140°-160°/140°-160°
- Angle of view 90-100 degrees,
- Working Length: minimum 65 cm or more
- Total length: at least 90-100 cm,
- Working Channel diameter: 2.0 mm or more,
- Distal Tip Outer Diameter: 5.0mm-5.5mm

#### Flexible Intubation Video Endoscope - Pediatric

- It should be light weight, high resolution & portable flexible scope.
- Integrated camera chip and LED light illumination
- ET TUBE HOLDER should be a part of standard accessory of flexible scope and should be from same manufacturer.
- There should be 5cm interval markings on the scope.
- Set should include- Suction Adaptors (Disposable), Cleaning brush & Leakage tester as standard accessories along with carrying case
- Scope should be suitable for following applications-
- Endotracheal Intubation
- Bronchoscopy
- Foreign body removal
- Bronchial Lavage
- Inspection of the Airways
- Dilatation Tracheotomy
- Technical Details of Flexible Video Endoscope-
- Tip deflection UP/DOWN: 140°-160°/140°-160°

  
 डॉ० (सेक्टर) संजय सिंह  
 MD, EDRM, FCCP, FNIY  
 Associate Professor  
 Pulmonary Medicine  
 RMLIMS, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

- Angle of view 90-100 degrees,
- Working Length: minimum 65 cm or more
- Total length: at least 90-100 cm,
- Working Channel diameter: 1.5 mm or less,
- Distal Tip Outer Diameter: 4.0mm-4.5mm

Note: -

1. All quoted items should be from the same manufacturer for total system compatibility and optimal system performance.
2. Demonstration of the complete system is must before finalization of opening finance bid.
3. The system should be USFDA / European CE certificate with 4 digit notified body.
4. OEM should have ISO 13485:2016 certified service process in India.

*Sanjay*

डॉ० (संजय) संजय सिंह  
MD, EDRM, FACP, FNIIV  
Associate Professor  
Pulmonary Medicine  
RMLIMS, Lucknow

*P.K.D.*

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Advanced Bronchoscope System

### System Consists of:

1. Adult Video Bronchoscope
2. Paediatric Video Bronchoscope
3. Video Processor and Light Source
4. HD Video Monitor
5. Endoscopy Mobile Trolley
6. Recording Software with the computer system for report generation
7. Accessories
8. The price of all the compatible consumables should be quoted and fixed for a period of 5 years
9. All products including accessories should be from same make, except Report Generation software with device and Accessories

### 1) **Adult Video Bronchoscope with 2.8mm working channel for Therapeutic usage**

- Should be flexible with optimum instrument channel size for Adult usage
- Should be lighter and have high-definition image quality
- Compatibility with Electro cautery & Laser
- Fully immersible in disinfectant solution.
- Must have dedicated insertion tube rotation function Right & Left 120 Degree
- Two or more no. of remote-control switches on control body
- Field of view should be 120 degree or more
- Direction of view should be 0-degree, forward viewing
- Depth of field should be 3 to 100 mm or better
- Distal end & Insertion tube outer diameter should be 6.2 mm or less
- Tip Bending range should be Up 180 deg & Down 130 deg & more
- Working length should be 600 - 700 mm or more
- Channel inner diameter should be 2.8 mm or more
- Minimum Visible distance should be 3 mm or better
- Should be supplied with leakage tester

### 2) **Paediatric Video Bronchoscope**

- Should be flexible with chip-on-tip technology bronchoscope with optimum instrument channel size for Paediatric usage
- Distal end outer diameter should be 3.8mm or less
- Insertion Tube outer diameter should be 3.8 mm or less
- Depth of field should be 2-100mm or better
- Channel diameter should be 1.2mm to 1.7mm
- Insertion tube length should be 600mm or more
- Field of view should be 110 degrees-120 degrees or more.
- Angulation: UP-180 degree or more and Down-130 degree or more

*sanjay*

Sr. (Sur) with RML  
MD, EDRM, FCCP, FNIJ  
Associate Professor  
Pulmonary Medicine  
RMLIMS, Lucknow

*P.K. Das*

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

### 3) Video Processor and Light source

- Should be compatible with high-resolution HDTV imaging capacity (No Adaptor/Convertor will be accepted)
- System should have the facility of Real-time optical chrome endoscopic images to enhance the visibility of fine capillaries & mucosal details using the latest technology (FICE/BLI/NBI/I-scan OE)
- Electronic magnification by 1.2 X-1.5 X or more
- Automatic scope identification for compatible scopes
- Processor should be compatible with Endoscopic ultrasound (EBUS) system for future upgradation
- 300 W Xenon/LED Light Source (Separate / Combined Unit from Video Processor) with a lamp life of at least 5000 hours
- Should contain a portable memory USB slot for still image recording.
- Should have automatic white balance function & leakage testing
- Halogen/LED light should have backup
- 4 spare 300W Xenon/LED light bulbs

### 4) Medical Grade Colour Monitor

- Screen size 24 inches or more.
- Medical Grade monitor
- Full HD display (1920x1200)
- Compatible picture-in-picture display with compatible video processor and endoscopes.

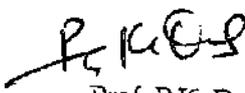
### 5) Endoscopy Mobile Trolley : It should be OEM provided trolley.

- Of stainless steel
- Space to accommodate all equipment
- Should have a Scope Hanger
- Based on Castor-Wheel with locking facility
- Should be from same OEM & brochure should be provided along with it

### 6) Recording Software with computer system for report generation

- Processor i7 or better and of latest generation.
- RAM 8GB or more & with internal memory 512 GB SSD or more and external Hard Disk 1 TB or more
- 21" LCD /LED monitor.
- Mouse & Multimedia keyboard should be supplied
- Medical grade Recording & Report generation software

  
 डॉ० (विजर) संजय सिंघा  
 MD, EDRM, FCCP, FNIS  
 Associate Professor  
 Pulmonary Medicine  
 RMLIMS, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

- Colour laser printer
- UPS with appropriate rating with at least 60 minutes backup

**Certifications:**

- Should be US-FDA/CE(European)/BIS approved

**Scope of supply:**

- Suction valves-20 (autoclavable)
- Cytology brush with sheath-10 sets
- TBNA needles with sheath-10 sets
- Cleaning brushes (reusable)-10
- Airway Guide cum Bite block (for oral intubation) (reusable)-10
- Biopsy forceps-toothed 10, cup-10, plain-10
- Foreign body forceps- rubber tip -5, alligator-2, dormia basket-5

*Sanjay*

Dr. Sanjay Das  
MD, EDPM, FCCP, FRCG  
Associate Professor  
Pulmonary Medicine  
RMLIMS, Lucknow

*P.K.D.*

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

### Fiberoptic Bronchoscope (Paediatrics)

**System Consists of:**

1. Adult Video Bronchoscope
2. Paediatric Video Bronchoscope
3. Video Processor and Light Source
4. HD Video Monitor
5. Endoscopy Mobile Trolley
6. Recording Software with the computer system for report generation
7. Accessories
8. The price of all the compatible consumables should be quoted and fixed for a period of 5 years
9. All products including accessories should be from same make, except Report Generation software with device and Accessories

**Paediatric Video Bronchoscope**

- Should be flexible with chip-on-tip technology bronchoscope with optimum instrument channel size for Paediatric usage
- Distal end outer diameter should be 3.8mm or less
- Insertion Tube outer diameter should be 3.8 mm or less
- Depth of field should be 2-100mm or better
- Channel diameter should be 1.2mm to 1.7mm
- Insertion tube length should be 600mm or more
- Field of view should be 110 degrees-120 degrees or more.
- Angulation: UP-180 degree or more and Down-130 degree or more

**Video Processor and Light source**

- Should be compatible with high-resolution HDTV imaging capacity (No Adaptor/Convertor will be accepted)
- System should have the facility of Real-time optical chrome endoscopic images to enhance the visibility of fine capillaries & mucosal details using the latest technology (FICE/BLI/NBI/I-scan OE)
- Electronic magnification by 1.2 X-1.5 X or more
- Automatic scope identification for compatible scopes
- Processor should be compatible with Endoscopic ultrasound (EBUS) system for future upgradation
- 300 W Xenon/LED Light Source (Separate / Combined Unit from Video Processor) with a lamp life of at least 5000 hours
- Should contain a portable memory USB slot for still image recording.
- Should have automatic white balance function & leakage testing
- Halogen/LED light should have backup

*Sanyal*  
 MD, FRCR, FRCR, FRCP  
 Associate Professor  
 Pulmonary Medicine  
 RMLMS, Lucknow

*P.K.D*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLMS, Lucknow

- 4 spare 300W Xenon/LED light bulbs

#### Medical Grade Colour Monitor

- Screen size 24 inches or more.
- Medical Grade monitor
- Full HD display (1920x1200)
- Compatible picture-in-picture display with compatible video processor and endoscopes.

#### Endoscopy Mobile Trolley : It should be OEM provided trolley.

- Of stainless steel
- Space to accommodate all equipment
- Should have a Scope Hanger
- Based on Castor-Wheel with locking facility
- Should be from same OEM & brochure should be provided along with it

#### Recording Software with computer system for report generation

- Processor i7 or better and of latest generation.
- RAM 8GB or more & with internal memory 512 GB SSD or more and external Hard Disk 1TB or more
- 21" LCD /LED monitor.
- Mouse & Multimedia keyboard should be supplied
- Medical grade Recording & Report generation software
- Colour laser printer
- UPS with appropriate rating with at least 60 minutes backup

#### Certifications:

- Should be US-FDA/CE(European)/BIS approved

#### Scope of supply:

- Suction valves-20 (autoclavable)
- Cytology brush with sheath-10 sets
- TBNA needles with sheath-10 sets
- Cleaning brushes (reusable)-10
- Airway Guide cum Bite block (for oral intubation) (reusable)-10
- Biopsy forceps-toothed 10, cup-10, plain-10
- Foreign body forceps- rubber tip -5, alligator-2, dormia basket-5

*Sanyal*

Dr. (Sanyal) Sanyal  
M.D., EDPM, FCCP, FNI  
Associate Professor  
Pulmonary Medicine  
RMLIMS, Lucknow

*P.K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Fiberoptic Bronchoscope (Adult)

### System Consists of:

1. Adult Video Bronchoscope
2. Paediatric Video Bronchoscope
3. Video Processor and Light Source
4. HD Video Monitor
5. Endoscopy Mobile Trolley
6. Recording Software with the computer system for report generation
7. Accessories
8. The price of all the compatible consumables should be quoted and fixed for a period of 5 years
9. All products including accessories should be from same make, except Report Generation software with device and Accessories

### **Adult Video Bronchoscope with 2.8mm working channel for Therapeutic usage**

- Should be flexible with optimum instrument channel size for Adult usage
- Should be lighter and have high-definition image quality
- Compatibility with Electro cautery & Laser
- Fully immersible in disinfectant solution.
- Must have dedicated insertion tube rotation function Right & Left 120 Degree
- Two or more no. of remote-control switches on control body
- Field of view should be 120 degree or more
- Direction of view should be 0-degree, forward viewing
- Depth of field should be 3 to 100 mm or better
- Distal end & Insertion tube outer diameter should be 6.2 mm or less
- Tip Bending range should be Up 180 deg & Down 130 deg & more
- Working length should be 600 - 700 mm or more
- Channel inner diameter should be 2.8 mm or more
- Minimum Visible distance should be 3 mm or better
- Should be supplied with leakage tester

### **Video Processor and Light source**

- Should be compatible with high-resolution HDTV imaging capacity (No Adaptor/Convertor will be accepted)
- System should have the facility of Real-time optical chrome endoscopic images to enhance the visibility of fine capillaries & mucosal details using the latest technology (FICE/BLI/NBI/I-scan OE)
- Electronic magnification by 1.2 X-1.5 X or more
- Automatic scope identification for compatible scopes

*Sanjiv*

MD, DDM, FCO, FRCR  
Associate Professor  
Surgical Medicine  
RMLIMS, Lucknow

*P. K. Das*

Prof. P. K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

- Processor should be compatible with Endoscopic ultrasound (EBUS) system for future upgradation
- 300 W Xenon/LED Light Source (Separate / Combined Unit from Video Processor) with a lamp life of at least 5000 hours
- Should contain a portable memory USB slot for still image recording.
- Should have automatic white balance function & leakage testing
- Halogen/LED light should have backup
- 4 spare 300W Xenon/LED light bulbs

#### Medical Grade Colour Monitor

- Screen size 24 inches or more.
- Medical Grade monitor
- Full HD display (1920x1200)
- Compatible picture-in-picture display with compatible video processor and endoscopes.

#### Endoscopy Mobile Trolley : It should be OEM provided trolley.

- Of stainless steel
- Space to accommodate all equipment
- Should have a Scope Hanger
- Based on Castor-Wheel with locking facility
- Should be from same OEM & brochure should be provided along with it

#### Recording Software with computer system for report generation

- Processor i7 or better and of latest generation.
- RAM 8GB or more & with internal memory 512 GB SSD or more and external Hard Disk 1 TB or more
- 21" LCD /LED monitor.
- Mouse & Multimedia keyboard should be supplied
- Medical grade Recording & Report generation software
- Colour laser printer
- UPS with appropriate rating with at least 60 minutes backup

*Sanyal*  
 MD, ED, FRCR, FRCR, FRCR  
 Associate Professor  
 Pulmonary Medicine  
 RMLIMS, Lucknow

*P. K. Das*  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**Certifications:**

- Should be US-FDA/CE(European)/BIS approved

**Scope of supply:**

- Suction valves-20 (autoclavable)
- Cytology brush with sheath-10 sets
- TBNA needles with sheath-10 sets
- Cleaning brushes (reusable)-10
- Airway Guide cum Bite block (for oral intubation) (reusable)-10
- Biopsy forceps-toothed 10, cup-10, plain-10
- Foreign body forceps- rubber tip -5, alligator-2, dormia basket-5

*Sanjay*

MD, EDRL, FCCP, FRCR  
 Associate Professor  
 Pulmonary Medicine  
 RMLIMS, Lucknow

*P.K. Das*

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

# BASIC BRONCHOSCOPY SYSTEM (CRYO SYSTEM PULMONOLOGY BRONCOSCOPY)

## Cryotherapy unit

1. Unit should comprise of Cryo system with flexible Cryo Probes from the same OEM to perform Biopsies, Recanalization & devitalisation.
2. Should be supplied with an integrated High End RF Electro Surgical Unit from the same OEM for electrosurgical Cut & Coag modes for optimum effect of HF surgery & dedicated high-end Argon plasma coagulation unit also from the same OEM for homeostasis of bleeding tissues & devitalisation of pathological tissues with non-contact technology for coagulation.
3. The Cryotherapy System should be programmable based, monochrome display, activation via footswitch and the minimum freezing temperature should reach within 5 seconds mounted on mobile cart with wire basket and CO2 Cylinder (02Units) compatible with cooling gas - CO2 gas as coolant and provided with connection pipe for gas exhaust.
4. The Unit should have a connector for single hand operation.
5. The Cryotherapy System should be flow controlled for operating gas pressure between 45- 60 bar & should have feature to count the reprocessing cycle of the instrument.
6. The Offered System should have Effect Settings up to 5 depending on the type of instruments used; with an Programmable memory of up to 10 settings with activation from Foot Switch.
7. The Cryotherapy System should work on Frequency of 50/60Hz with a line current of 0.4-0.8 Amp.
8. The Equipments accessories & consumables should be of same offered Original Equipment Manufacturer & demonstration mandatory of offered model at hospital premises at OEM cost.
9. The system should be convenient to operate and should be of high quality and reliability.
10. The offered Mobile Cryo Workstation should be able to get synchronised with other compatible Energy Units of same make & OEM so that can be used as an Advanced Workstation.
11. Trolley: Compatible trolley of same/reputable make for mounting all components.
12. Others
  - a. Compatible constant voltage transformer and UPS, if required, of appropriate capacity should be supplied
  - b. All connecting cables to make the system work.

## Certifications:

- The Cryotherapy System should be, US-FDA/ European CE certified.

## Scope of Supply:

- a. Flexible cryo Probe of 2.4 mm diameter - 20 Qty
  - b. Flexible cryo Probe of 1.7 mm diameter - 20 Qty
  - c. Flexible cryo Probe of 1.1mm diameter - 10 Qty
- The cryoprobes should be reusable multiple times.

*Sanyal*

Dr. (P) P.K. Das  
MD, EDPM, FCCP, FRCR  
Associate Professor  
Pulmonary Medicine  
RMLIMS, Lucknow

*P.K. Das*

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## ADVANCED BRONCHOSCOPY SYSTEM (CRYO SYSTEM PULMONOLOGY BRONCOSCOPY)

### Cryotherapy unit

1. Unit should comprise of Cryo system with flexible Cryo Probes from the same OEM to perform Biopsies, Recanalization & devitalisation.
2. Should be supplied with an integrated High End RF Electro Surgical Unit from the same OEM for electrosurgical Cut & Coag modes for optimum effect of HF surgery & dedicated high-end Argon plasma coagulation unit also from the same OEM for homeostasis of bleeding tissues & devitalisation of pathological tissues with non-contact technology for coagulation.
3. The Cryotherapy System should be programmable based, monochrome display, activation via footswitch and the minimum freezing temperature should reach within 5 seconds mounted on mobile cart with wire basket and CO2 Cylinder (02Units) compatible with cooling gas - CO2 gas as coolant and provided with connection pipe for gas exhaust.
4. The Unit should have a connector for single hand operation.
5. The Cryotherapy System should be flow controlled for operating gas pressure between 45- 60 bar & should have feature to count the reprocessing cycle of the instrument.
6. The Offered System should have Effect Settings up to 5 depending on the type of instruments used, with an Programmable memory of up to 10 settings with activation from Foot Switch.
7. The Cryotherapy System should work on Frequency of 50/60Hz with a line current of 0.4-0.8 Amp.
8. The Equipments accessories & consumables should be of same offered Original Equipment Manufacturer & demonstration mandatory of offered model at hospital premises at OEM cost.
9. The system should be convenient to operate and should be of high quality and reliability.
10. The offered Mobile Cryo Workstation should be able to get synchronised with other compatible Energy Units of same make & OEM so that can be used as an Advanced Workstation.

### Argon plasma Coagulation system

11. Should be compatible for use with bronchoscopes and be able for the management of bleeding and devitalisation of tissue abnormalities achieved by optimal coordination with RF / ESU generator of the same make.
12. The Argon Plasma Coagulation system should have automatic parameters setting for various types of instruments and automatic depth-controlled plasma regulation.
13. Should have three different APC modes suitable for different indications.  
 Precise APC — adjustment made using the effect settings  
 Pulsed APC — adjustment made using the parameter power settings  
 Forced APC — adjustment made using the parameter power settings

*Sanjay*

Dr. (Sanjay) Sanjay  
 MD, EDRA, FOCM, FIMM  
 Associate Professor  
 Pulmonary Medicine  
 RMLIMS, Lucknow

*P.K.D.*

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

14. Should have Adjustable argon flow rate from 0.1L/min to 8L/ min in steps of 0.1 L/min with automatic regulation of selected flow rate.
15. Should have the facility to use Argon Plasma Coagulation & Monopolar Coagulation simultaneously
16. Should have automatic monitoring of flow rate and Argon supply and auto purge facility.
17. It should have the facility to connect with central gas supply.
18. Should give visual display of argon gas bottle content and should give Acoustic alarm when bottle content reaches a minimum.
19. Should have facility for activation of unit by foot pedal of the Electro Surgical unit.
20. APC Probes
21. Should be compatible with endoscopes/Bronchoscopes with channel diameter of 2.8 mm or more

**certificatons:**

- System should be US-FDA/ European CE certified.

**Electrosurgical generator**

22. Should be compatible for use with bronchoscopes and be able for the management of bleeding and devitalisation of tissue abnormalities.
23. The supplied Electro Surgical Unit should be micro controller based & should adjust the power to get the desired surgical effect on the tissue. All settings should be controlled by the machine and according to the tissue delivery. Power should be displayed on the screen with graph facility to show the delivered power.
24. The unit should have step guide suggesting appropriate setting configurations for every instrument and application.
25. Should have monopolar and bipolar functions
26. Electro Surgical unit should have cut and coagulation modes.
27. Should have unique EndoCut mode for pulmonary surgical related procedures
28. Coagulation mode should have option of variable coagulation like soft coagulation, forced coagulation, spray coagulation.
29. The electro surgical unit should have Power and Voltage automatic regulation feature to prevent tissue damage and charring.
30. It should have provision of audiovisual alarm and deactivate output if contact between patient and patient plate is not proper to eliminate the risk of patient burns.
31. Should have facility to show active instruments on the screen display.
32. Trolley: Compatible trolley of same/reputable make for mounting all components.
33. Others
  - a. Compatible constant voltage transformer and UPS, if required, of appropriate capacity should be supplied
  - b. All connecting cables to make the system work.

*Sanjay*

MD, EDPM, FRCR, FRCS  
Associate Professor  
Pulmonary Medicine  
RMLIMS, Lucknow

*P.K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**Certifications:**

- The supplied Electro Surgical Unit should be USFDA / European Certificate marketed in accordance with the medical device's directive (93/42/EEC), Class I Equipment & Electromagnetic Compatibility certificate & ISO Certificate.

**Scope of Supply:**

- a. Flexible cryo Probe of 2.4 mm diameter - 20 Qty
- b. Flexible cryo Probe of 1.7 mm diameter - 20 Qty
- c. Flexible cryo Probe of 1.1mm diameter - 10 Qty
- The cryoprobes should be reusable multiple times.
- d. Axial (Straight fire) probe - 10 Nos
- e. Lateral (Side fire) probe - 5 Nos
- f. Radial (Circumferential) probe - 5 Nos
- g. Neutral electrodes / patient plate for Argon Plasma procedures - 02 Box.

*Sanjay*

Dr. Sanjay Das  
 MD, EDMM, FOCF, FNB  
 Associate Professor  
 Pulmonary Medicine  
 RMLIMS, Lucknow

*P.K.D.*

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## BASIC SLEEP LAB SYSTEM(DIGITAL VIDEO POLYSOMNOGRAPHY SYSTEM)

- 1) It should have a complete modular system with the facility to record 33 channels and be upgradable to 60 channels in the future.
- 2) The unit should be portable and allow the patient to move freely during the sleep study. The total weight of the system (excluding the PC) should not exceed 300 gms.
- 3) Should have the inbuilt capability to record abdominal and chest effort, Nasal/Oral Airflow (both Thermistor and Nasal Cannula), PLMs, Snoring (Microphone), Motor activity, body position, Spo2, pulse rate, moment, ambient light, Cpap/Bipap pressure and event marker and 15 EEG/EOG plus chin reference and ECG channel for complete staging.
- 4) The unit should have the facility to store data on a Flash card and simultaneously transmit it to the Base station/PC. Data Should Be Stored on a high-speed compact flash card with up to 1 GB capacity or up to a minimum of 24 hours of PSG recording time.
- 5) The system should be able to work on a battery so that there is no electrical interference with EEG signals.
- 6) Should have the ability to transfer data wirelessly/ Bluetooth from the patient side to the PC such that there are no wires connected from patient to acquisition PC also means full mobility to the patient.
- 7) The unit should have an intelligent connect facility.
- 8) Should have automatic analysis, detection of Apneas/Hypopneas, Bradycardia/Tachycardia's, O2 desaturations, Sleep Staging (Alpha, Beta & Delta freq analysis) calculation of Average Freq Analysis, Body Position, Pulse Transition Time, Snoring and PLM analysis.
- 9) Should have FFT Analysis of all EEG waveforms and capability to record Heart Rate Variability.
- 10) Should have adjustable low and high pass filters to have clear view of EEG.
- 11) Should have ability for re-referencing, re-montaging and re-filtering at any time or even after the study has been recorded.
- 12) Should have an ECG Elimination filter for EEG. Also should have facility of Brain mapping.
- 13) The system should be able to record Systolic and Diastolic BP either from PTT signal or from 3rd party standalone system through non-inflating soft finger cuffs that can directly be interfaced with the machine.
- 14) Should have scoring comparison (quality control) feature which will allow comparison between scoring by different users, including sleep stages, respiratory events and AHI, arousal's and limb movements, with provision for calculation of percentage agreement between different users.
- 15) The software should have ability to record and analyse raw data and generate the report according to recent AASM guidelines.
- 16) Should have capability to export and import the complete study in EDF Format, exe format, and reports can be exported to Excel and PDF format.

*Sanjay*

MD, EDPM, FCCP, FRC  
Associate Professor  
Pulmonary Medicine  
RMLIMS, Lucknow

*P.K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

- 17) Video Camera High Resolution ,Integrated IR illumination, Microphone, Line out for Speakers, Wall or ceiling mount, Power supply, Software for synchronized recording, editing and archiving
- 18) Camera should be controlled directly via Software.
- 19) Treatment facility: The system should be provided with Multimodality titration function i.e CPAP and Bilevel..
- 20) Review Station: Highest configuration Mac / Windows based 'all-in-one' desktop computers with at least 3rd Generation Intel Core™ i5 Processor, 8 GB RAM, 18-20 inch display with colour printer .

**Certifications:**

- 1. The unit should be either European CE Marked / FDA approved.

**Scope of supply:**

- 1. Both Full mask and Nasal mask for titration device to be provided.
- 2. The system quoted should be supplied with 100 number Nasal Cannulas .

*Sanjay*

Dr. (Sanjay) Sanjay Das  
 MD, ED, FRCR, FCCP, FRCR  
 Associate Professor  
 Pulmonary Medicine  
 RMLIMS, Lucknow

*P.K.D.*

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## HIGH END SLEEP LAB SYSTEM (DIGITAL VIDEO POLYSOMNOGRAPHY SYSTEM)

Description of Function: Polysomnography and sleep studies are performed to diagnose illnesses or syndromes related to sleep

**Operational Requirements:** The Polysomnography System must have an integrated ZRIP driver to set the patient faster and easier by reducing the no. Of connection during hook-up.

### Technical Specifications

**Total Number of Channels should be: More than 60**

- a) EEG input should be of : 32
- b) The machine should have EMG input of: 5
- c) The machine should have EOG of: 2
- d) The machine should have ECG: 7 (3 Physical and 4 derived)
- e) Nasal/oral/Airflow : 1
- f) Flow (Thermal) : 1
- g) Respiratory Effort, Zrip : 2
- h) Snoring, Microphone : 1
- i) Body Position : 1
- j) CPAP Pressure : 1
- k) Limb Movement : 2
- l) SaO2 [Masimo/Nonin/Nellcor/FAST] : 1
- m) Pulse rate : 1
- n) Light sensor : 1
- o) Sensors : 2

3.2 Sensor- pediatric and adult, microphone, pulse Oximeter sensor, and leads) of ECG, EEG, Leg & chin EMG, EOG

3.3 Additional 8 DC channels for external peripherals like capnography, PH, blood pressure Monitor etc.

### 3.4 Other Technical Specifications

- a) Pressure transducer for nasal airflow

*Sanjay*

MD, EDPM, FCCP, FRCR  
Associate Professor  
Pulmonary Medicine  
RMLIMS, Lucknow

*P.K.D.*

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

- b) Automatic chin EMG referencing
- c) Integrated Pulse Oximeter.
- d) on-screen impedance check
- e) Pulse transit time (PTT)
- f) Adjustable gain and notch filter.
- g) Full compressed raw data stored on all channels.
- h) Facility for fully synchronized and integrated patient video recording and monitoring.
- i) Video camera should be networked
- j) Real time Access to studies for analysis currently being recorded from the review/recording station.
- k) Data replay with software operates on latest Microsoft windows professional. Computer with 8 GB RAM with 1024 GB hard drive with color laser Printer.
- l) Computer interface through LAN for integration into hospital network.
- m) Portable recording workstations can operate anywhere/on standalone basis.
- n) Screen resolution from 800 X 600 to 1200 X 1600
- o) User definable Montages, montage changes
- p) User configurable reports-All night dump sleep stage summary, Arousal summary etc.
- q) Automatic Sleep Staging with manual override, Respiratory / PLM<sub>i</sub>s analysis, Neurological events.
- r) Independent, selectable time basis for upper & lower portions of the screen enabling the see fast moving traces like EEG and Slower respiratory waveforms on the lower half.
- s) Capnography Should Be there [accuracy  $\pm 0.1\%$  ]
- t) Titration device should be as follows:-

Modes: CPAP, Auto CPAP, S, Auto Bi-level, S/T, T, PC, AutoSV, AVAPS-AE.

Weight Approximately: less than 2.5 kg

Altitude compensation: Automatic

Pressure ranges CPAP: 4- 20 cm H<sub>2</sub>O Auto CPAP : 4- 20 cm H<sub>2</sub>O S Mode :EPAP: 4-25 cm H<sub>2</sub>O, IPAP: 4 – 30 cm H<sub>2</sub>O Auto Bi-level : EPAP: 4 -25 cm H<sub>2</sub>O, IPAP 4-25 cm H<sub>2</sub>O S/T, T, PC:EPAP:4- 25 cm H<sub>2</sub>O, IPAP:4 – 30 cm H<sub>2</sub>O AutoSV :EPAP: 4-30 cm H<sub>2</sub>O, Pressure Support: 0- 26 cm H<sub>2</sub>O AVAPS-AE: 4-30 cm H<sub>2</sub>O, Pressure Support 2 – 26 cm H<sub>2</sub>O

*Sanjay*  
 MD, ED, FRCR, FRCR, FRCR  
 Associate Professor  
 Pulmonary Medicine  
 RMLIMS, Lucknow

*P.K. Das*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**4. Environmental factors:**

The unit shall be capable of operating continuously in ambient temperature of 20- 30 deg C and relative humidity of 30-70%

**5 Power Supply**

- 5.1 Power input to be 220-240VAC, 50Hz fitted with Indian plug
- 5.2 UPS of suitable rating with voltages regulation and spike protection for 60 minutes back up.

**6 Documentation**

- 6.1 User/Technical/Maintenance manuals to be supplied in English.
- 6.2 List of important spare parts and accessories with their part number and costing.
- 6.3 Certificate of calibration and inspection.
- 6.4 List of equipment available for providing calibration and routine Preventive Maintenance Support as per manufacturer documentation in the service/technical manual.

**7 Interior**

- 7.1 One complete wooden double bed 6 feet width x 6 feet length with suitable double bed mattress (Sleepwell/ kurlon) with side table with One wooden double door cupboard with 70cm length x 35 cm width with multiple internal racks and one locker.
- 7.2 sound proofing [more than 10db sound]
- 7.3 False roofing with all necessary POP work with adequate LED lighting (Philips).

**Certifications:**

1. Shall meet IEC-60601-1-2:2001(Or Equivalent BIS) General Requirements of Safety for Electromagnetic Compatibility, or should comply with 89/366/EEC; EMC-directive.
2. Should be US FDA approved
3. Manufacturer should have ISO certification for quality standards.
4. Electrical safety conforms to standards for electrical safety IEC 60601-1 (OR EQUIVALENT international/national standard) General requirement for Electrical safety of Medical Equipment.

**Scope of supply:**

- Actigraphy-1
- LoFlo (Etco2) Starter Kit - 1
- Standard Set of sensor Kit - 2

*Sanjay*

*P. K. Das*

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Dr. P. K. Das, MCh, FRCR, FRCR, FRCR, FRCR  
Associate Professor  
Anaesthesiology  
Dr. RMLIMS, Lucknow

# IMPULSE OSCILLOMETRY SYSTEM (IOS) WITH PSG, DIFFUSION STUDY, FOT

## Should be able to measure

- Dynamic lung volumes
  - Measurement of the Forced Vital Capacity (FVC), Slow Vital Capacity (SVC) and Maximal Ventilatory Ventilation (MVV).
  - Graphic display of Flow/volume, Volume/time loops.
- Bronchial challenge test
  - Measurement of the response to Broncho constriction and Broncho dilatation, graphic display of fall FEV1.
  - Broncho - Challenge test with Body Plethysmography (RAW Challenge test)
  - Integrated dosimeter for accurate dose calculation.
- Static lung volumes
  - Measurement of TGV, RV, VC, IRV, ERV, FRC, TLC, IC
- Airway resistance
  - real-time display of curves and full editing capabilities for sReff, sRtot, sR0.5 and determination of Reff, Rtot, R0.5, etc
  - RAW (Insp, exp, tot), SRAW, GAW, SGAW, Derived parameters
- Respiratory Mechanics
  - MIP/MEP and Respiratory Drive (P0.1)
- CO-Diffusion SB Realtime:
  - with continuous, high speed gas analysis for calculation of DLCO, VA, KCO, TLC, FRC, RV and trapped gas evaluation.
- Forced oscillation technique/ Impulse oscillometry with measurement of Total Respiratory System Impedance, Resistance, Reactance, Resonance frequency, frequency dependency, average Rrs and Xrs, discriminant function with Accuracy  $\pm 2\%$

## Technical Specifications

### Body plethysmography

- A wide cabin with internal volume in range of 800-900 litres to provide ease of accessibility and comfort to the patient without effecting volume changes.
- The box should have with transparent glass walls to ensure visibility from all sides and minimize any claustrophobic feeling for the patient.
- The door should be especially designed to ensure full-proof tightness.
- The machine should have facility for door closing and opening both by operator and patient.
- The seat must be comfortable and adjustable in height.
- The arm for the breathing valve support must be flexible enough to allow tests execution even outside the cabin.
- Controlling station should be on a suitable movable trolley
- Gas sampling close to the mouth via thin sample line.

*Sanjay*

Dr. Sanjay Kumar  
M.D., EDPM, FCOG, FNB  
Associate Professor  
Pediatric Medicine  
RMLIMS, Lucknow

*P.K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

- Inhalation of the gas via built-in demand valve for minimum gas consumption.
- Airway pressure monitoring during the complete maneuver for full quality control
- Intercom facility for communication with the patient sitting inside the box.
- Automatic system calibration facility with ultrasonic sensor (preferably). If calibration needed than the necessary equipment/accessories for calibration must be supplied.
- The operating AC Voltage range of Indian 220 Volts AC
- Flow meters: latest technology-based flow sensor (ultrasonic preferable).
- Full test procedures should be able to complete in less than 3 minutes
- Should be able to view the last 4-5 s Raw loops with automatic slope (BTSPS) compensation
- Guidance and patient animation for stable sRaw and tidal breathing including view of breathing frequency (BF)
- Should be able to perform combined slow/forced spirometry manoeuvre or separated Manoeuvre
- Different animation incentive to perform forced Spirometry
- Should be able to review comprehensive results with clear, easy to read, logical screens, assisting technician and clinician with a variety of tools like Z-score, ULN-LLN
- Should have Single-click overlay functionality of all trials for resistance and FRC pleth curves to check reproducibility and quality
- Resistance/Volume loop for the quick diagnosis
- Comprehensive setting possibilities (axis scaling, resting/painting mode, number of loops, tangents for sReff, sRtot., ERV or IRV manoeuvre etc..)

#### Diffusion capacity

- Standard breath-holding maneuver with all test gases sampled at the mouth, from the start to the end of the test.
- Discard and sample volumes should be able to modify to test even the smallest vital capacity subjects and any volume of dead space.
- Should have Intra-breath/OR equivalent test facility for less cooperative, elderly patients when breath holding is not easy to obtain, with just a slow inhalation and exhalation.
- Should have a training mode so that the patient, coached by the operator, can practice a test with room air and therefore get faster to qualitative results on the diffusion manoeuvre without waste of test gas.
- Analyzer should be most linear one over the full range of measurement for Helium / Methane as tracer gas and CO analysis with acceptable range and accuracy.
  - CO Analyzer: Preferably Non-Dispersive Infrared (NDIR) or ATS/ ERS recommended techniques.
  - Helium Analyzer: The equipment must use Helium as tracer gas and measurement of He preferably by Ultrasonic Mol mass/Thermal Conductivity determination technique/ ATS/ERS recommended technique.

*Sanjay*

(Dr.) Sanjay  
M.D. DDM, FCCP, FRCR  
Associate Professor  
Pulmonary Medicine  
RMLIMS, Lucknow

*P.K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

### Impulse Oscillometry/Forced Oscillometry(FOT)

- Mouth Pressure sensor Range:  $\pm 12.7$  cmH<sub>2</sub>O, Resolution  $\pm 0.002$  cmH<sub>2</sub>O, Linearity 0.05% fs
- No patient co-operation should be required and the system should be suitable for use in adult patients even with advanced lung diseases.
- The measurement should be Fast and easy assessment and the processing time should be less than 10 seconds.
- Should be able to predict reversibility conditions using Tidal breath analysis (Tidal flow-volume)
- Sensors:
  - All sensors should preferably be non-consumable or their life should be specified and the bidder should arrange free sensors for the warranty/CMC period.
  - All sensors of equipment should meet the American Thoracic Society (ATS)/European Respiratory Society (ERS) standard for linearity, response time, and accuracy.
- Power Supply: The operating AC Voltage range should be 100-240V AC $\pm$ 10% 50/60Hz.
- Interface: It should have RS232/USB interface for connecting to a computer. The management software should be designed for Windows 10 environment and also should be able to connect to online hospital information system and work flow, when necessary, with easy data storage and recovery for research purpose.
- Essential Accessories: The system should be supplied with all essential accessories required like:
  - Medical grade compact trolley with height adjustable work surface, preferably from same/ reputed manufacturer (local trolley not acceptable)
  - All in one Desktop PC, with Intel i7 processor, 8GB RAM, 1TB hard drive memory, Original Windows 10 with anti-virus valid for 1 year, 20" LED Colour Display monitor, keypad and mouse.
  - Monochromatic laser printer
  - Integrated Isolation transformer for smooth functioning of the equipment
  - Online UPS 5-KVa
  - Diffusion Test gas cylinder with dual staged pressure regulators: (03 No's)
  - Anti-Bacterial Filters: 3000 nos.
  - Reusable rubber nose clips: 50 nos.
  - Silicon Mouthpieces: 1000 nos
- Report Designer for modification of an existing report or generate a new one, i.e., layout, graphs, parameters, style, font size and colour are free configurable.
- System should have all latest reference values including GLI 2017 as well as Indian reference values for Spirometry, Diffusion and Body plethysmography.
- System should have reference values for Oscillometry

*Sanjay*

Dr. Sanjay Kumar Singh  
 MD, EBM, FICP, FNB  
 Associate Professor  
 Pulmonary Medicine  
 RMLMS, Lucknow

*P.K. Das*

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLMS, Lucknow

**Certifications:**

- The system should have ISO/ BIS/ European CE/US FDA, certifications and should meet latest ATS/ERS standardization guidelines.
- The company should also provide a certificate stating the model provided in the latest version available.

*sanjay*

MD, ED, FRCA, FRCR, FRCR  
Associate Professor  
Intensive Care Medicine  
RMLIMS, Lucknow

*P.K. Das*

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**COPE PLEURAL BIOPSY NEEDLE:**

Consists of two needles:

Outer needle 10GA, Square Cut, Tapered Point

Inner Needles 13GA with fitted stylet 13GA with side slot

Sharp biopsy snare

The mirror finish length of the needle 5-inch

Can be steamed and sterilized

**Certification:**

Company should be ISO certified.

*Saijag* 08/04/2025

Dr. (P.K.) Das MD  
MD, EDRM, FCCP, FRCR  
Associate Professor  
Pulmonary Medicine  
RMLIMS, Lucknow

*P.K.D.*

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

प्रेषक,

महानिदेशक,  
चिकित्सा शिक्षा एवं प्रशिक्षण,  
उत्तर प्रदेश।

सेवा में,

प्रमुख सचिव,  
उत्तर प्रदेश शासन,  
चिकित्सा शिक्षा अनुभाग-एक।

संख्या-एम0ई0/पर्चेज(उपकरण)/2025-26/ 249

लखनऊ:दिनांक-06/06/2025

विषय-प्रदेश के राजकीय मेडिकल कालेजों/स्वशासी राज्य चिकित्सा महाविद्यालयों/चिकित्सा संस्थानों/चिकित्सा विश्वविद्यालयों में उपकरणों/फर्नीचरों के क्रय हेतु मानकीकृत तकनीकी विशिष्टियों के निर्धारण के सम्बन्ध में।

महोदय,

उपर्युक्त विषय के सम्बन्ध में अवगत कराना है कि शासन के कार्यालय ज्ञाप संख्या-आई/472361/2024 दिनांक-16.01.2024 द्वारा प्रदेश के राजकीय मेडिकल कालेजों/स्वशासी राज्य चिकित्सा महाविद्यालयों/चिकित्सा संस्थानों/चिकित्सा विश्वविद्यालयों में उपकरणों/फर्नीचरों के क्रय हेतु तकनीकी विशिष्टियों का निर्धारण किये जाने हेतु वित्तीय वर्ष 2024-25 हेतु पृथक-पृथक समितियों का गठन किया गया था। शासन द्वारा उक्त गठित समितियों से ही वर्ष 2025-26 के लिए भी उपकरणों की तकनीकी विशिष्टियां निर्धारण हेतु विस्तारित किया गया है।

महानिदेशालय के पत्र संख्या-एमई/पर्चेज/2024-25/605 दिनांक-08.11.2024 द्वारा प्रदेश के राजकीय मेडिकल कालेजों/स्वशासी राज्य चिकित्सा महाविद्यालयों/चिकित्सा संस्थानों/चिकित्सा विश्वविद्यालयों में उपकरणों/फर्नीचरों के क्रय हेतु शासनादेश संख्या-133/2021/आई/112605/2021 दिनांक-03.11.2021 द्वारा 136 उपकरण, शासनादेश संख्या-128/2022/आई/244885/2022 दिनांक-07.12.2022 द्वारा 393 उपकरण एवं शासनादेश संख्या-148/2023/आई/426645/2023 दिनांक-10.11.2023 द्वारा 33 उपकरणों की तकनीकी विशिष्टियां, जिनकी वैधता अवधि वित्तीय वर्ष 2024-25 (मार्च, 2025 तक) तक थी, के अतिरिक्त पूर्व के शासनादेशों क्रमशः दिनांक- 28.12.2017, 18.01.2018, 06.03.2018 व 23.08.2018 द्वारा स्वीकृत उपकरणों/फर्नीचरों की विभागावार समेकित सूची संलग्न कर वर्ष 2025-26 हेतु तकनीकी विशिष्टियों का निर्धारण किये जाने हेतु तकनीकी विशिष्टिता निर्धारण समितियों को पृथक-पृथक प्रेषित किये गये थे।

महानिदेशालय के उक्त पत्र दिनांक-08.11.2024 के क्रम में प्रो0 पी0 के0 दास, अध्यक्ष, क्लीनिकल विषयों हेतु, तकनीकी विशिष्टिता निर्धारण समिति, विभागाध्यक्ष, एनेस्थीसिया एवं गहन चिकित्सा विभाग, डा0 राम मनोहर लोहिया आयुर्विज्ञान संस्थान, लखनऊ ने पत्र संख्या-65/एनेस्थीसिया/डा0रा0म0लो0आ0सं0/2025 दिनांक-29.05.2025 द्वारा कुल 484, डा0 पुनीता मानिक, अध्यक्ष, नान क्लीनिकल विषयों हेतु, तकनीकी विशिष्टिता निर्धारण समिति, आचार्य, के0जी0एम0यू0, लखनऊ ने पत्र संख्या-177/ANAT/2025-26 दिनांक-05.06.2025 द्वारा कुल 197 तथा डा0 मोनिका अग्रवाल, अध्यक्ष, पैरा क्लीनिकल विषयों हेतु, तकनीकी विशिष्टिता निर्धारण समिति, आचार्य, के0जी0एम0यू0, लखनऊ ने पत्र संख्या-1713/सीएम/टेक्नी0स्पेशि0-2025 दिनांक-29.05.2025 द्वारा कुल 230, इस प्रकार कुल (484+197+230) 911 उपकरणों/फर्नीचरों की तकनीकी विशिष्टियां तैयार कराते हुए दो वर्षों की वैधता अवधि हेतु इस कार्यालय को प्रेषित की गयी है।

डा0 शालीन कुमार, अध्यक्ष, सुपर स्पेशियलिटी एवं अन्य अतिविशिष्ट उपकरणों हेतु, विभागाध्यक्ष, एस0जी0पी0जी0आई0, लखनऊ को महानिदेशालय द्वारा कुल 12 पत्र प्रेषित किये जाने

2. प्रेषित  
9.6.2025

के उपरान्त भी सुपर स्पेशियलिटी एवं अन्य अतिविशिष्ट कुल 81 उपकरणों की तकनीकी विशिष्टियां उपलब्ध नहीं करायी गयी है।

डा० शालीन कुमार, अध्यक्ष, सुपर स्पेशियलिटी एवं अन्य अतिविशिष्ट उपकरणों हेतु, विभागाध्यक्ष, एस०जी०पी०जी०आई०, लखनऊ द्वारा तकनीकी विशिष्टियां उपलब्ध न कराये जाने के कारण पूर्व में वित्तीय वर्ष 2022-23 से वित्तीय वर्ष 2024-25 तक सुपर स्पेशियलिटी एवं अन्य अतिविशिष्ट उपकरणों हेतु निर्धारित तकनीकी विशिष्टियों की समयावधि एक वर्ष (वर्ष 2025-26 तक) विस्तारित किये जाने हेतु पृथक से पत्र प्रेषित किया जा रहा है।

अतः तकनीकी विशिष्टिता निर्धारण समिति के अध्यक्षों द्वारा उपलब्ध करायी गयी कुल 911 उपकरणों/फर्नीचरों की तकनीकी विशिष्टियां, जो कि 02 वर्षों की वैधता अवधि हेतु प्रेषित की गयी है, को संलग्न कर इस आशय से प्रेषित है कि इन्हें वित्तीय वर्ष 2025-26 तथा वित्तीय वर्ष 2026-27 हेतु, 02 वर्षों के लिए उपकरणों/फर्नीचरों के क्रय हेतु निर्धारित किये जाने के सम्बन्ध में आवश्यक शासकीय आदेश निर्गत करने का कष्ट करें।

संलग्नक-यथोपरि।

भवदीया



(किंजल सिंह)  
महानिदेशक

# Radiology



**... Certificate about Technical Specifications  
related to Department of Radiology by committee  
members**

SR. NO.	NAME OF EQUIPMENT	GO NUMBER	APPROX. COST
1.	PREMIUM REAL TIME 4D COLOUR DOPPLER ULTRASOUND SYSTEM FOR OBSTETRICS AND GYNAECOLOGY (FOR CENTRE WITH HIGH VOLUME OBSTETRIC ULTRASOUND WORKLOAD)	GO-28-DEC-17 SUCHI-1	60 LACS
2.	COMPUTED RADIOGRAPHY SYSTEM WITH DRY LASER IMAGER	GO-7-DEC-2022 GO-23-AUG-18 SUCHI-4	15 LACS
3.	MULTI LOAD COMPUTED RADIOGRAPHY SYSTEM WITH DRY LASER IMAGER		50 LACS
3.	SPECIFICATION FOR DIGITAL MOBILE RADIOGRAPHY SYSTEM WITH FLAT PANEL DETECTOR	GO-23-AUG-18 SUCHI-4 GO-1/112605/2021 GO-7-DEC-2022 GO-28-DEC-17 SUCHI-1	25 LACS
4.	TECHNICAL SPECIFICATION OF DIGITAL MAMMOGRAPHY	GO-1/112605/2021 GO-28-DEC-17 SUCHI-1	200 LACS
5.	SPECIFICATION FOR DIGITAL RADIOGRAPHY SYSTEM (1000 MA) WITH TWO FLAT PANEL DETECTORS	GO-1/112605/2021 GO-1/112605/2021 GO-7-DEC-2022 GO-28-DEC-17 SUCHI-1	(200 LACS)
6.	DIGITAL RADIOGRAPHY FLUOROSCOPY SYSTEM WITH FLAT PANEL DETECTOR	GO-1/112605/2021 GO-1/112605/2021 GO-7-DEC-2022	450 LACS
6.	BASIC COLOR DOPPLER ULTRASOUND EQUIPMENT		30 LACS
6.	MID END COLOR DOPPLER ULTRASOUND EQUIPMENT		40 LACS
6.	UPPER MID END COLOR DOPPLER ULTRASOUND SYSTEM WITH REAL TIME 2D SHEAR WAVE ELASTOGRAPHY		75 LACS
6.	HIGH END COLOR DOPPLER EQUIPMENT WITH REAL TIME 2D SHEAR WAVE ELASTOGRAPHY		100 LACS
7.	TOMO-MAMMOGRAPHY/TOMOSYNTHESIS GUIDED BREAST BIOPSY UNIT	GO-7-DEC-2022 GO-1/112605/2021	400 LACS
7.	TOMO-MAMMOGRAPHY/TOMOSYNTHESIS GUIDED BREAST BIOPSY UNIT		500 LACS
8.	300 MA FIX X-RAY MACHINE WITH HORIZONTAL TABLE & WALL MOUNT CHEST STAND	GO-28-DEC-17 SUCHI-1	20 LACS

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**Dr. Sukriti Kumar**  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU Lucknow

*[Signature]*  
**Prof. P.K. Das**  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow



**... ABOUT Technical Specifications  
related to Department of Radiology by committee  
members**

	DIGITAL RADIOGRAPHY SYSTEM (300 MA) WITH SINGLE DETECTOR		50 LACS
9.	500 MA FIX X-RAY MACHINE WITH HORIZONTAL TABLE & WALL MOUNT CHEST STAND	GO-28-DEC-17 SUCHI-1	25 LACS
	SPECIFICATION FOR DIGITAL RADIOGRAPHY SYSTEM (500 MA) WITH TWO DETECTORS		75 LACS
	SPECIFICATION FOR DIGITAL RADIOGRAPHY SYSTEM (500 MA) WITH TWO DETECTORS		150 LACS
10.	128 SLICE CT SCAN	GO-7-DEC-2022 GO-7-DEC-2022 GO-7-DEC-2022 GO-7-DEC-2022 GO-1/12605/2021 GO-7-DEC-2022	10 CRORES
11.	3T MRI SYSTEM	GO-7-DEC-2022	25 CRORES
	1.5 TESLA MRI MACHINE		19 CRORES
12.	SINGLE PANEL X RAY ILLUMINATOR	GO-7-Dec-2022	10,000/-
13.	DUAL PANEL X-RAY ILLUMINATOR	"	20,000/-
14.	TRIPPLE PANEL X-RAY ILLUMINATOR	"	30,000/-
15.	QUAD PANEL X-RAY ILLUMINATOR	"	40,000/-

This is to certify that technical specification of all the above-mentioned machine/instruments, approved by the technical committee is not of any specific company. The technical features of the equipment/instruments from all reputed firms in the current market have been included in this specification to the best of my knowledge and belief & in the opinion of the technical committee.

The technical specification duly signed by the technical committee members is attached herewith.

**Dr. Sukhni Kumar**  
Assistant Professor  
Department of Radiodiagnosis

**Dr. Sukhni Kumar**  
Professor Junior Grade  
Department of Radiodiagnosis

Department of Radiodiagnosis  
KGMU, Lucknow.

**Dr. Samrendra Narayan**  
Professor  
Department of Radiodiagnosis  
Dr.RMLIMS, Lucknow

**Prof. P.K. Das**  
Chairman

Technical Specifications Committee  
Clinical Subjects & Others  
Head, Department of Anesthesiology & CCM  
Dr RMLIMS, Lucknow

**Premium Real Time 4D Colour Doppler Ultrasound System for  
Obstetrics and Gynaecology (for centre with high volume obstetric  
ultrasound workload)**

1. System should be the latest "state of the art" fully digital Ultrasound equipment capable of performing, OBS-GYN, Radiology, MSK, Vascular, Small parts Cardiology Adult and Neonatal
2. The system should have the following modes: B-Mode (2D), conventional M-Mode with varying sweep rates, Anatomical M-Mode, PW Doppler with high PRF (PW), High PRF Doppler Mode, (TD) – Tissue Doppler mode, Color Flow Doppler Mode (CFM), Power Doppler Mode (PD), directional power Doppler, HD-Flow Doppler Mode (HD-Flow), and B-Flow (BF). B/Color/FW Doppler in simultaneous real time. Volume Mode: 3D Static & 4D Real Time on Convex and Intracavity probes and Matrix technology probes should be compatible with the system
3. Power Doppler Angio imaging and perfusion studies should be available for visualization of flow in small vessels and should be supported by all transducers.
4. System should have fully independent triplex multiple mode operation for extraordinary ease during Doppler examination, should be possible on all probes.
5. 23 inch High Resolution LCD/ LED/OLED with high resolution 10" LCD touch panel & 4 Active universal Probe Ports
6. Volume imaging, multi-slice imaging with variable slice thickness and multiplanar imaging on all types of 3D and 4D modes.
7. System should have facility for volume 3D/4D with Convex and option of taking 4D TV Probe in near future
8. Should be capable of performing live 4D Imaging with Volume transducers. 4 D imaging should be possible in grayscale, colour mode, harmonic mode and with contrast agent imaging. Instant rendering of MPR images should be possible that rival acquired 2D resolution.

*[Signature]*  
Dr. Sukriti Kumar  
Professor Junior Grade

Department of Radiodiagnosis  
KGMU, Lucknow

*[Signature]*  
Prof. P.K. Das  
Professor & Head

Dept. of Anaesthesiology & Critical Care  
KGMU, Lucknow

**Premium Real Time 4D Colour Doppler Ultrasound System for  
Obstetrics and Gynaecology (for centre with high volume obstetric  
ultrasound workload)**

- 3D/4D tool Obtain any plane from a 3D or 4D volume by simply drawing a line, curve, polyline or trace through a structure. This valuable technology enables views of even irregularly shaped structures not attainable in 2D imaging. Excellent approach for examination of complex structures with curvilinear or irregular shapes. Benefit Reduces your manipulation of X-Y-Z Allows any slice in any plane - no longer locked into orthogonal planes Ease of understanding of coronal plane when you simply 'draw' one
9. System should have 17,00,000 or more digital processing channels. Higher number of channels will be preferred.
  10. Dynamic range should be 260 dB or more, with range adjustability by selecting different Dynamic Contrast Curves. Higher dynamic range will be preferred.
  11. A 2D imaging depth of at Minimum Depth of Field: 1 cm (Zoom, probe dependent)  
Maximum Depth of Field: 40 cm (probe dependent) More will be preferred.
  12. 256 (8 bits) discrete grey levels
  13. 16.8 million Colours 24 bit
  14. 2D acquisition frame rate more than >1200 frames/sec, color Doppler frame rate more than 400/s
  15. Multiple focal imaging
  16. Real time compounding with colour or power Doppler imaging
  17. Multiple frequency selection for better penetration and resolution for better tissue differentiation and better contrast resolution
  18. Post processing tools for annotation, measurement, correction of angle, baseline, sweep speed should be possible on stored images
  19. System should have multivariate Tissue Harmonic imaging facility including coded harmonics on all transducers. It should be able to operate with compound imaging

Dr. Mukriti Kumar

Professor Junior Grade

Department of Radiodiagnosis

KGMU, Lucknow

Prof. P.K. Das

Professor & Head

Dept. of Anaesthesiology & CCM

Dr. RMLIMS, Lucknow

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- and speckle reduction algorithm. System should have one touch tissue contrast resolution adjustment without altering the set pre-sets levels.
20. System should have real time compounding image technology with minimum 11 transmitted lines of sight. Real-time Compound Imaging should operate in conjunction with Tissue Harmonic Imaging, volume modes, Panoramic imaging, and duplex Doppler, and in conjunction with speckle reduction imaging
  21. High resolution algorithms for advanced speckle noise reduction, refined tissue pattern displays, and fine border definition. Should operate in 2D and 2D/CFI/Doppler mixed modes and with 3D and contrast agent imaging. This feature shall have operator selectable settings and be capable of displaying in side-by-side mode with non-speckle reduced image.
  22. Should have trapezoidal imaging and steerable imaging for 2D, colour & Doppler with linear probe. Beam Steering should be possible with angles up to 30 Degree on linear probe.
  23. Panoramic / extended field of view imaging should be available on 2D mode on convex and linear transducers. This mode should build the extended field-of-view in a real-time manner, showing the image as it builds.
  24. One button automatic adjustment / optimization for 2D mode, color mode and Doppler mode. With auto correction of relevant fields of the 3D mode as well
  25. Incorporates advanced technology like coding excitation transmit technology and Coded harmonics mode for imaging deeper areas for imaging obese patients will be preferred.
  26. The system should have a fast boot up time less than 200 seconds, when switch 'ON' from 'OFF' position, and less than 18 second from 'STANDBY' position. Specify the system booting time, less will be preferred.
  27. System should have high-capacity fans with automatic speed for system cooling.

Dr. Sukran Kumar

Professor Junior Grade

Department of Radiodiagnosis

KG MU, Lucknow

Dr. P. K. Das

Professor & Head

Dept. of Anaesthesiology & CCM

Dr. RMLIMS, Lucknow

**Premium Real Time 4D Colour Doppler Ultrasound System for  
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ultrasound workload)**

28. Year of introduction of the specific model – should be as latest as possible, preferably should have been launched within 3-5 years.
29. Unique user-friendly user interface for comfort and fast throughput

**SYSTEM CONTROLS:**

31. System should have at least 45 automated and user programmable pre-sets (output power, signal processing and calculations)
32. System should have facility to adjust 2D performance instantly for different patient types (Thin, average, obese)
33. The system shall display thumbnails on a clipboard with live gray mode while scanning to facilitate exams.
34. Pan and zoom facility with high resolution results in both live & frozen images. Higher zoom will be preferred. with HD-Zoom functionality up to 22x Zoom
35. Cine loop review facility in individual and mixed modes (frame by frame and in video mode) ,2D: up to 10 min (depending on B-image size and FPS); typical: about 3min/4000 images (with curved array: 15cm depth,  
 • M-Mode: up to 20 min motion time (depending on sweep speed and depth)  
 • Doppler mode – up to 10 min motion time (depending on sweep speed)
36. Post processing in Freeze mode (Dynamic Range adjustment, Colour display on / off, Colour / Doppler invert, Colour/ Doppler baseline adjustment, sweep speed, measurement, annotation and pictogram). Post processing of B-mode images with Speckle Reduction algorithm.
37. Real-time automatic Doppler calculations on touch of a button. Should provide facility to apply automatic Doppler analysis retrospectively to frozen spectral data or data retrieved from Doppler scrolling. Possibility of manual Doppler trace
38. System should have at least 8 callipers with depth information and extensive, customizable measurement and report packages including Vascular, Abdominal, Small-

**Dr. Supriti Kumar**

Professor Junior Grade

Department of Radiodiagnosis

KGMU, Lucknow

**Prof. P.K. Das**

Professor & Head

Dept. of Anaesthesiology & CCU

Dr. RMLIMS, Lucknow

### Premium Real Time 4D Colour Doppler Ultrasound System for Obstetrics and Gynaecology (for centre with high volume obstetric ultrasound workload)

Parts, Urology, Paediatrics, Ortho, Neurology, complete Obstetrics, multi-gestational Calculations, Gynaecology, and Fetal Heart report packages.

- 39. Callipers should have minimum precision of 0.1mm, small size callipers for measuring < 5 mm
- 40. Callipers of dynamically varying contrast compared to background. Delete last measurement option, curved linear distance measurement.
- 41. Measurements (distance & area) should be possible in real time (non-frozen), frozen & on saved images as well.
- 42. Facility to save reports along with patient data which can be retrieved later. Measured parameters must be printed directly in form of a report through laser printer.
- 43. System should have facility of electronic biopsy guide and algorithm for clear needle visualization. The system should be capable of displaying biopsy lines (for all Transducers) while performing a fusion of B mode and color mode.
- 44. Speed & Volume Angle adjustment on volume imaging
- 45. Different render direction to view the volume image
- 46. Advanced tool for accurate quantification of irregular regions in 3D & automatically calculates the number and volume of hypo-echoic structures to speed follicular assessments
- 47. Ability to restrict firing of the probe to a particular slice thickness of the region of interest
- 48. Advanced tool for selection of slice thickness out of complete volume dataset
- 49. 4D fetal Echo- 2D +COLOR+B flow, STIC + Power Doppler Mode
  - STIC + CFM Doppler Mode, • STIC + HD-Flow Mode • STIC + CRI
  - STIC + CRI + CFM • STIC + CRI + PD
  - STIC + CRI + HD-Flow • STIC + B-Flow
  - STIC + multi-slice mode with cine movement.

**Dr. Sukrin Kumar**  
 Professor Junior Grade  
 Department of Radiodiagnosis  
 KGMU, Lucknow

*[Signature]*  
 Dept. of Radiodiagnosis  
 RMLIMS, Lucknow.

*[Signature]*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCU  
 Dr. RMLIMS, Lucknow

**Premium Real Time 4D Colour Doppler Ultrasound System for  
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50. Advanced imaging mode for visualisation of hypo-echoic areas and get automatic precise volume followed with the measurements of each region and proper reporting.
51. Simultaneous visualisation of 3 planes and Realtime 4D to guide the needle to the lesion
52. Additional Software related to follicle, Biometry, Advanced 4D, Scan Assist, Render should be quoted as standard part of the Scope of supply Transforming Nuchal Thickness measurement with automation within fraction of seconds for the fast and accurate scanning supporting sonographers or radiologist to finish their scan within short time
53. Should have auto 3D/ 4D rendering as well to get the best reproduction of 3D image in fraction of second with one touch
54. Advanced Spatio Temporal Image correlation with STIC & Anatomical-M mode for the diagnoses of atrial and ventricle synchronisation/ dysfunctionality of the Fetal heart. Automated sonography-based technology helps streamline the acquisition of volumetric images of the fetal heart, displaying all eight recommended views with two steps after accusation of volume data set.

**PHYSICAL DIMENSIONS:**

55. The equipment should be a room based wheeled unit with integrated brake, footrest, transducer, cable and gel bottle holder, and with hydraulic height adjustment facility for control panel and monitor independently. Transducer and gel bottle holders should be provided from both sides of the keyboard for the user-friendliness of the machine.
56. 23 inch High Resolution LCD/LED Display
57. Extra Light Innovative user interface with high resolution 10.1 in LCD touch panel & System should have a full-size Alphanumeric Keyboard with interactive backlighting. The keyboard should be floating with rotation from centre, and with adjustable Height.

Dr. Sukh Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

Dept. of Radiodiagnosis  
KGMU, Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCU  
Dr. RMLIMS Lucknow

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58. Integrated recording keys for remote control of up to 4 Peripherals or DICOM devices, one dedicated DVD recording key

59. The system shall have 4 universal probe ports easy to access location with electronic switching facility. 4 Active universal Probe Ports

**IMAGE STORAGE, DOCUMENTATION DEVICES & CONNECTIVITY  
ISSUES:**

60. Must allow digital storage of gray scale as well as color images (both frozen & cine loops). Facility of reviewing and exporting in different formats.

61. System shall support the ability to store digital raw data that allows optimizing imaging parameters such as B Gain, TGC, Color Gain, Dynamic Range, Speckle Reduction levels, Doppler Gain, Doppler Base Line on image recalled from the image archive.

62. The system should have on board storage facility for at least 500 GB. The hard drive should be inbuilt. Cine Features: • Dual/Quad image CINE Display • CINE Gauge and CINE image number display • CINE Review Loop • Selectable CINE Sequence for CINE Review (by Start

Frame and End Frame) • Side Change in dual CINE Mode • Measurements /Calculations & Annotations on CINE Length: • 512MB: up to 10 min and 13,200 frames (depending on

B-image size & FPS); typical: about 3 min/4000 images (with curved array: 15cm depth, angle 81°, 22 FPS) • M-Mode: 32MB: up to 1 min motion time (depending on sweep and depth) • PW/CW-Mode: 32MB: up to 1 min motion time (depending on sweep speed)

63. The system shall provide the ability to sort images stored on board based on patient name, exam date, patient ID and exam types. Patient directory should show network status as print status, archive status, commit status and export to DVD status.

Integrated Software DVR • Digital recording • One drive for data export and recording

*Dr. Sumit Kumar*

Professor Junior Grade

Department of Radiodiagnosis  
KGMU, Lucknow

*Prof. P.K. Das*

Professor & Head

Dept. of Anaesthesiology & CCU  
Dr. R.M. ...

**Premium Real Time 4D Colour Doppler Ultrasound System for  
Obstetrics and Gynaecology (for centre with high volume obstetric  
ultrasound workload)**

- DVD Formats: DVD+R, -R, +RW, -RW for recording, DVD and CD support for data export • USB support: FAT32 compatibility
- 64. Possibility to modify / edit patient data during and after exam has been stored and saved
- 65. Must have an integrated CD /DVD writing- burning facility and it could be viewed on any ordinary PC. Machine must have capability to write CD/DVD separately of a previous patient during scanning to save time. Should be able to archive data from previously stored CD/DVD. DVD / CD drive to store / retrieve images in different formats (TIFF/JPG / AVI / DICOM) / Patient reports
- 66. System should be DICOM (higher version) ready (Storing, Transfer, Print
- 67. USB PORT: minimum 4 USB ports in machine and must be providing with USB memory stick to transfer images
- 68. System should be easily intergraded in hospital PACS without any extra cost

**TRANSDUCERS & BIOPSY ATTACHMENTS:** (C. The system must be provided with the following transducers: (all the supplied transducers should be provided with reusable biopsy guide) and bandwidth can be wider by 2 MHz on either side and narrow by up 1 MHz on one end of width)

- a) Convex Probe 2-5 MHz for Abdomen
- b) TV/TR Volume Probe 4 - 9 MHz for Obstetrics, Gynaecology
- c) Linear Probe 4 MHz to 12 MHz
- d) TV/TR Probe 4 - 9 MHz for Obstetrics, Gynecology
- e) Convex Volume Probe 2 - 8 MHz for Abdomen, Obstetrics, Paediatrics

**Accessories:**

- a) B/W thermal printer of latest model for image printouts. Please specify the brand, model and specification details.
- b) Suitable Online UPS with 30 minutes of battery backup

**Dr. Sukhri Kumar**

Professor, Junior Grade

Department of Radiodiagnosis

KGMU, Lucknow

**Prof. P.K. Das**

Professor & Head

Dept. of Anaesthesiology & Critical Care

Dr. P.K. Das

**Premium Real Time 4D Colour Doppler Ultrasound System for Obstetrics and Gynaecology (for centre with high volume obstetric ultrasound workload)**

**Others:**

- a) All information in the tender document must be supported in the product data sheet
- b) Compliance statement sheet must quote page number/s as it appears in the product data sheet enclosed by the vendor
- c) System should be European CE and USFDA certified

*[Handwritten signature]*  
 Deptt. of Radiodiagnosis  
 KGMU, Lucknow.

*[Handwritten signature]*

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

*[Handwritten signature]*

Dr. Sukriti Kumar  
 Professor Junior Grade  
 Department of Radiodiagnosis  
 KGMU, Lucknow

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# Computed Radiography System with Dry Laser Imager

Computed Radiography must be a state-of-the-art system manufactured by a reputed brand or manufacturer adhering to following specifications. CR system should broadly comprise of following modules/ components:

## I. IMAGE RECORDING SYSTEM (READER/ DIGITIZER)

## II. IDENTIFICATION & CR PROCESSING WORKSTATION (1 Each)

## III. DRY LASER IMAGER

### I. IMAGE RECORDING SYSTEM (READER/ DIGITIZER)

- The CR reader / digitizer should be able to process minimum 60 image plates/hr of the largest size cassette i.e. 14"x17".
- CR reader / digitizer must be able to handle phosphor image plates.
- It should have a resolution of 5 pixels/mm, 10 pixel/mm & 20 pixels/mm
- Gray scale resolution: CR reader / digitizer should have a minimum resolution of 12bits/ pixel for images sent to CR processing station.

### II. IDENTIFICATION & CR PROCESSING WORKSTATION.

- Should have min. 17" LCD/TFT display for console and reviewing workstation of 19" clinical grade Monitor to view images of good resolution.
- Mechanism for printing Multiple Images in one film, with the possibility of slide and true size printing
- Should have a protocol for verifying the connectivity status of configured image destinations.
- Should have Customizable Graphic User Interface
- Should be capable to store more than 5000 images
- Indication of Under/Over Exposure on the preview module.
- Capability of interfacing to HL7, Non-HL7, Proprietary, DICOM Work list or user defined Windows/DOS /Linux based interface protocols to HIS/RIS.
- Customizable Graphic User Interface (GUI) in Identification station with facility of selecting DICOM print & Storage destination.
- Mechanism for User release from Preview terminal in case of Auto-routing Images to Pre-defined DICOM Destinations.
- Solution for storing patient demographic data for multiple exams in RIS/non RIS environment.
- It should be possible to put a custom configurable data field in the demographic information of the patient.
- CD and DVD Burner.
- Various image-processing protocols should be available for the respective regions of the body.
- Built in routine for using predefined image processing parameters for image quality enhancement.

*Dr. Suniti Kumar*

Professor, Junior Grade

Department of Radiodiagnosis

KG MU, Lucknow

*P.K. Das*

Professor & Head

Dept. of Anaesthesiology & CCM

Dr. RMLIMS, Lucknow

## Computed Radiography System with Dry Laser Imager

- Mechanism for storing the Patient image based on name, date, exam, etc.
- Capability of storing user defined image processing parameters.
- Capability of overwriting predefined image parameter with user-defined parameters & storing these two images separately.
- Manual correction typographically in-Patient Demographic module, in case of any problem with RIS connection.
- Capability of changing W/L, Flipping, Rotating, Zooming, Collimating Annotating incoming image

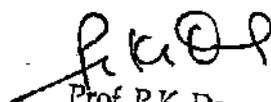
### III. DRY LASER IMAGER SYSTEM

- Should be a Dry laser image printer with a resolution of 500 dpi or more
- Should have a gray scale resolution of at least 14 bits.
- Processing capacity should be minimum 70 Films/hr for the largest size (14"x17").
- Capable of Printing Images in DICOM 3.0 format or latest version.
- The system must have at three online film sizes and should be capable of printing any of the 8" X 10", 10" X 12", 14" X 17" films.

### IV. Accessories

- The following sizes of radiography cassettes along should be supplied along with the unit.
  - a) 14" X 17": 4 nos.
  - b) 10"x 12": 4Nos.
- Should supply an ON-LINE compatible UPS of 3 kva battery backup for 30 minutes.
- Equipment should be notified European CE (notified 4 digit no) / USFDA approved. Copy of the certificate shall be produced along with the technical bid.

Topic of Radiodiagnosis  
for RMLIMS, Lucknow.

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

# Multi load Computed Radiography System with Dry Laser Imager

## A. Multi Load /Multi-slot (Computed Radiography (CR) System

1. CR System should be high quality, state of the art system with fast processing capability. It should have the following specifications.
2. CR System should be multiload/multi-slot type: capable of processing three or more image plates simultaneously
3. Image recording system (cassettes & imaging plates). The following sizes of radiography cassettes along with image plates should be supported by the unit.
  - a. 35 cm X 43 cm or 14"x17" :10 nos
  - b. 24 cm X 30 cm or 10"x12" : 10 nos

## B. Image reader (CR reader/ digitizer)

1. The CR reader / digitizer should be able to process 65 image plates/hr or more
2. CR reader digitizer must be able to handle phosphor image plates.
3. CR Reader capable of handling the latest Dual side needle/ structured / columnar image plates will be preferred.
4. It should have a resolution of 6 pixels/ mm (minimum) for standard resolution cassettes & 10 pixel / mm (minimum) for high resolution cassette reading.
5. Digitizer must have a resolution of 20 pixel/ mm (minimum) for screening mammography.
6. Gray scale resolution: CR reader / digitizer should have a minimum resolution of 12bits/ pixel for images sent to CR processing station.

## C. Image Workstation, Processing Software & Patient Registration System

1. The processing station must have 6GB RAM, at least 2x 500 GB SSD in RAID configuration and 19-inch clinical grade monitor. The PC hardware and monitors must be from reputed brands like DELL, HP, and BARCO etc. The monitor should have a wide viewing angle, and it should be clinical grade monitor with at least 1.3 MP resolution.
2. Processing server capable of identification of patient demographics to the acquired images will be preferred, else a separate identification – station must be provided.
3. The server and /or work station must be DMWL (DICOM modality worklist) compliant to access patient and study data from HIS or RIS.
4. It should provide display of acquired images with greater details of demographics viz. patient/ study listening for easy access
5. The server must provide full amount of postprocessing features viz. geometric corrections, window level algorithms, annotations like markers, predefined text, drawing lines and geometrical shapes, multi-image processing, scale measuring distance and angles, shuttering, histograms, grey scale reversal, edge enhancement, noise reduction, indication of gray scale saturation level, latitude reduction etc. Image crop, zoom in & zoom out option.
6. The system should have a facility to indicate over /under exposure in the preview screen.
7. Software should be capable of digital correction of image quality & contrast.
8. It should be equipped with latest/updated DICOM printing and should be able to print multiple formats of patient study. It Should be able to send DICOM images to DICOM workstation or PACS without loss of information

Dr. Sukni Kumar

Professor Junior Grade

Department of Radiodiagnosis

KGMU, Lucknow

Prof. P.K. Das

Professor & Head

Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

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## Multi load Computed Radiography System with Dry Laser Imager

9. Should be equipped with DICOM CD writer for transferring image
10. Should be able transfer & store images on external device viz. CD or pen drive etc.
11. Kindly specify the image preview time.

### D. Dry Imager:

1. It should be of multi-slot type
2. The system must have a dry imager Without no wet chemistry
3. It must be DICOM 3.0 compatible allowing multiple modalities to be connected at a time
4. The system must be able to print at least 60 films/ hr of the largest size.
5. The system must deliver its first film in less than 90 seconds from the request sent
6. The imager must have spatial resolution of 500 ppi minimum
7. The system must have contrast resolution of 14 bits/pixel or more. The system must have at least three online film sizes and should be capable of printing any of the 8" x10", 10"x12", 11"x14" or 14"x17" films.
8. The imager should support daylight loading of films.

**E. Online UPS backup:** UPS backup of at least 30 minutes should be Provided for the whole system

**F. Power ratings:** Kindly specify

**G. Supplier:** Both CR system & Dry Imager should be supplied by OEM

**H. Certifications:** Both CR system & Dry Imager should have certifications from US FDA/ notified body European CE & ISO.

**I. Installation:** CR system & Dry Imager should be installed on "turnkey" basis. Civil work including site modification, if any, should be done according to hospital rules.

Dr. Sukriti Kumar

Professor Junior Grade

Department of Radiodiagnosis

KGMU, Lucknow

Dept. of Radiodiagnosis  
KGMU, Lucknow

Prof. P.K. Das

Professor & Head

Dept. of Anaesthesiology & CCM

Dr. RMLIMS, Lucknow

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## Specification for Digital Mobile Radiography System with Flat Panel Detector

State of Art, High frequency microprocessor controlled Mobile X-Ray with Fully integrated panel with touch screen console of suitable size. Integrated machines has seamless connectivity, Image acquisitions computer for easy troubleshooting of the system having following features:

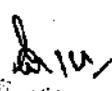
### The Generator:

- a) Microprocessor controlled high frequency inverter type (100 KHz or more) for constant output.
- b) It should have power rating of 6 KW or more.
- c) It should have a digital display of mAs and KV.
- d) KV range: 40kV to 125kV or wider range.
- e) Max mA 150 or more.
- f) mAs selection: 1 to 200mAs or more.
- g) The system should have APR of minimum 150 anatomical programs or more.
- h) Should have 18 inch or more touch screen console for integrated x-ray generator operation and image viewing at control side. Touch screen/feather touch screen console at tube side for ease of work at x-ray generator operation from tube end side also.

### X-Ray Tube and Collimator:

- a) Stationary anode and focal spot size should be 0.8-1.6mm or better.
- b) Should have collimator with on/off switch and auto shut facility.
- c) Display: Digital display of mAs and KV for easy parameter settings.
- d) Should display the Errors in case if any malfunction occurs in the system.
- e) The unit must have an effective braking system for parking and transport. The tube stand must be gas spring balanced stand (SBM)/fully
- f) counter balanced tube head stand with tube head rotation in all directions.
- g) The machine should have concealed cable in arm design.
- h) The system should have dual gas spring design to keep the tube-head straight always during up-down movement of Tube head.
- i) The system should have storage space to keep accessories, etc.
- j) The system should have the storage space for Flat Panel Detector:
- k) The machine should be equipped with double step exposure switch with long cord.
- l) The system should fully be safe with respect to: Over Current (b) Over Voltage (c) Maximum loading of tube
- m) Should have inbuilt Battery backup to do at least 100 X-Ray or more without need of any power source. (both for the x-ray exposure and control panel)

  
Dr. S. Prithi Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

  
Dept. of Radiodiagnosis  
RMLIMS, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCU  
Dr. RMLIMS, Lucknow

# Specification for Digital Mobile Radiography System with Flat Panel Detector

## Flat Panel Detector:

- a) The Detector should be Wireless, Size 14x17 and direct deposition CSI material or better.
- b) The weight of detector should be 3.5 kg or less
- c) The active area should be 358 x 430mm or better
- d) The Pixel Pitch should be 150 $\mu$  or less
- e) The Resolution should be 2.5k x 3.0k Pixels or better
- f) The system should have control panel of 18 inch (High Resolution) or more for detector imaging as mentioned above
- g) The detector should have IP67 or more rating against ingress protection.
- h) The detector should be supplied with good quality protection cover with
- i) integrated handle to prevent for breakdown during fall.
- j) The detector should have 100 or more images storage memory.
- k) Two nos. rechargeable batteries should be supplied with one charger.
- l) The software and Flat Panel Detector should be from same manufacturer.

## Miscellaneous

- a) The unit should operate on single phase power supply and should have plug in facility to any standard wall outlet with automatic adaption to line voltage  $\pm 10\%$ , 230volts, 15 Amp. plug.
- b) X-Ray Machine should be BIS/European CE with notified body/ USFDA & AERB approved.
- c) Flat Panel Detector should be European CE from a notified body and USFDA approved.
- d) The Flat panel detector and its image acquisition software should be from same manufacturer of the equipment with model of the detector should be mentioned on it.
- e) Two zero lead apron of 0.5mm lead equivalent.

Optional item: Dual tray dry laser printer 500 DPI or more to accommodate all film sizes

Dr. Sukrit Kumar

Professor Junior Grade

Department of Radiodiagnosis

KG MU, Lucknow

Dept. of Radiodiagnosis  
KG MU, Lucknow

Prof. P.K. Das

Professor & Head

Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Technical Specification of Digital Mammography

1. State of art, Full field digital mammography unit. Detector, Acquisition Software and generator should be from the same OEM only.  
The system should have the following features:
2. X-Ray Generator
  - a. X-Ray generator should deliver high frequency constant output with a minimum rating of 5KW with 100 mA at 35 kV.
  - b. kV range should be 22 to 49 kV or higher in 1kV increment.
  - c. mAs range should be 2 to 600 mAs or higher.
  - d. Automatic exposure control with manual override facility
  - e. Exposure lock to prevent accidental double exposure.
3. X-Ray tube
  - a. Heat storage capacity should be 150 KHU or more.
  - b. Dual focal spots of size 0.3 (large) and 0.1 mm (small).
4. Gantry
  - a. Fully motorized vertical movement and isocentric rotation. System should have comprised of Motorized retractable physical Grid with ratio shall be 5:1 or better with at least 30 lines per cm placed above the detector.
  - b. SID of 65 cm or more.
  - c. Removable patient face shield.
  - d. Fully automated compression mode.
5. Digital Flat Panel Detector
  - a. Solid state direct conversion type TFT based Flat Panel Detector, size 24x30 cm  $\pm$  1 cm or more. Specific Make, Model, Origin & OEM authorization of the detector quoted.
  - b. Pixel size of 100 micron or less
  - c. Specify image matrix (in pixel) and image size (in MB)
6. Acquisition workstation
  - a. Medical Grade Monitor of resolution of 3 megapixel or more
  - b. Facility for patient information, work list, scheduled workflow, mammography and Tomosynthesis image review, print, storage, query and retrieve
  - c. Storage capacity of 5000 images or more
  - d. Radiation dose of both standard views (2D) and Tomosynthesis (3D) should be displayed and transmitted to RIS-PACS
7. Image documentation and transfer
  - a. It should be possible to transfer images to USB drive in DICOM and PC format from Acquisition workstation and Reporting workstation.
  - b. The workstation is to be integrated with DICOM compliant network of the institute
  - c. Mammography and Tomosynthesis images should be vendor neutral so that viewing at any other workstation and storage in institute PACS server is possible.

Dr. S. K. Das  
Dept. of Radiodiagnosis  
KGMU, Lucknow

Dr. Sukanti Kumar  
Professor, Senior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CC  
Dr. RMLIMS, Lucknow

# Technical Specification of Digital Mammography

If these image formats are proprietary, appropriate licenses should be provided to convert them for general viewing.

- d. DICOM modality work list (DMWL) and modality pre procedure setup (MPPS) should be enabled.
- 8. Compression paddles
  - a. Two standard compression paddles of width 15 cm or more and 24 cm or more
  - b. Spot compression and axilla compression paddles
  - c. Wire localization paddle with open window and alpha-numeric markers
  - d. Original (OEM) wall mounted hanger for compact docking of above-mentioned paddles
- 9. Standard accessories
  - a) Latest BI-RADS Atlas (6th Edition) in hardcopy as well as soft copy
  - b) Multi-Modality viewer for viewing CT, MR, US, CR etc. images.
  - c) Radiation shield with 0.5 mm lead equivalent around acquisition workstation
  - d) The system should be regularly maintained in the latest version of computing software; including software platform updates/upgrades released for the respective system that can prepare it for future enhancements shall be free of cost during warranty and CMC period.
  - e) UPS for 30 minutes back-up for entire system.
  - f) Two tray online film camera with dpi 500 or more for printing of mammography films. Required networking of the same shall be done by the vendor.
  - g) Furniture and other accessories: Five Chairs, one Almira, one stool, two cupboard, two table with storage. Good quality ultralight Zero lead aprons with integrated thyroid shields (5 Nos) and stand. Ultrasonic pest repellents Four units to be provided and installed Regular servicing for pest / termite control to be undertaken.
  - h) Fire detection system to be provided in the area using photoelectric smoke detector and heat detectors on the ceiling and will be connected to the main panel of the center as per the requirement of IS/BIS/national/international code. Minimum 4kg of portable ABC type fire extinguishers to be provided for firefighting (5 Nos.).
  - i) Name boards for all rooms. Changing rooms should have change lockers and dressing table. Any other furniture item as per requirement. All furniture items should be of standard make. LED X-ray Film viewer with adjustable brightness; capable of holding 3 films of 14"x17" size, in all rooms as per requirement. Cabling of Network (LAN) connectivity for camera system, console system, workstation and computers etc. White Boards, Pin Boards and Wall clock etc. in all rooms as per requirements.
  - j) Whitewash every 2 years and day-to-day routine maintenance including problems arising from seepage, etc.
  - k) Sound proofing of the room

Dr. Sukriti Kumar  
 Professor Junior Grade  
 Department of Radiodiagnosis  
 KGMU, Lucknow

*[Signature]*  
 P. K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

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 DEPT. OF RADIOLOGY  
 KGMU, LUCKNOW

## Technical Specification of Digital Mammography

### 10. Other features

- a) The vendor should assist and facilitate site approval, registration, licensing and Certification of the facility by AERB.
- b) Vendors should have at least Five installation sites in India of the quoted system (with the quoted detector make/model configuration): performance certificate needs to be submitted along with the supporting documents.
- c) Onsite Training- The application specialist of the company should stay at the site at-least for 5 days at the time of installation to train all faculty members and technicians in machine operations. This will be followed by similar two visits of 5 days each in the initial 6 months or whenever required. The visits should be scheduled in consultation with the department of Radio-diagnosis.
- d) The system should have the following safety mechanisms: over voltage protection, short circuit protection and phase sequence corrector (for 3 phase equipment)

### 11. After sales, Warranty and CMC

- a) The comprehensive onsite warranty shall commence from the date of issue of installation certificate by the institute. The warranty will include main unit with all parts including x-ray tube and detector, all accessories and optional items supplied with the unit, all turkey items, including batteries etc. One free software upgrade during warranty and unlimited software updates should be provided.
- b) Regular maintenance and QA checks as per AERB norms will also be part of warranty and CMC.
- c) After sales service: a factory trained service engineer should be available and Service call must be attended within 24 hours.
- d) If the unit is being quoted by Indian agency which is not a direct subsidiary of the principals; an undertaking from the principals must be provided that in case of discontinuation or change of the agency, merger, acquisition or any corporate rearrangement, the principal will arrange for onsite maintenance of the unit and abide by all terms and conditions of the tender.

### 12. Turnkey Installation:

- a) The unit will be installed on Site-modification basis. The vendor should inspect the site before quoting and ensure that the unit and all accessories can be installed in the available space without any functional compromise. Civil modifications (Civil, electrical, fire safety and AC work) to be done as per the requirement in Machine & Reporting Room. Optimal Radiation safety requirements must be taken into consideration. Airconditioning for the Mammography Room should be provided. Adequate furniture and fixtures of reputed brands should be provided. It should also include approved quality floor tiles and full height wall tiles. Power supply by the institute will be terminated at desired one point within the

Dr. Sumit Kumar

Professor Junior Grade

Department of Radiodiagnosis

KGMU, Lucknow

Dept. of Radiodiagnosis  
in PGALMS, Lucknow.

Prof. P.K. Das

Professor & Head

Dept. of Anaesthesiology & C...

Dr. RGLIMS, Lucknow

## Technical Specification of Digital Mammography

Mammography site. All electrical provisions including equipment mains panel, UPS cabling and DB, earthing etc. will be vendor's responsibility. All Site-modification work must comply with hospital norms.

### 13. Instructions to vendors

- a) All information asked must be provided clearly in compliance sheet under same headings. Haphazardly given information will not be considered.
- b) Original Product Datasheet of main unit and all accessories, including third party items to be provided as a part of the technical bid. Photocopy or computer-generated data sheets or emails shall not be accepted.
- c) Any technical clarification required which is not mentioned in the product data sheet should be clarified by the principals or manufacturer.
- d) On-site training of the staff by application expert should be provided for the period of not less than 2 weeks, as per the convenience of the department.
- e) "The equipment should have USA FDA or European CE certified with four digit notified Body number or BIS approved and certificate to be submitted. OR. Should meet IEC 60601-1, IEC60601-1-2 and IEC 60601-2-37 standards and valid test report to be submitted from NABL accredited lab for the quoted model or lab in the country of origin"

Dept. of Radiodiagnosis  
Dr. RMLIMS, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Sukanti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

## Specification for Digital Radiography System (1000 ma) with Two Flat Panel Detectors

Digital X-ray should be state of the art with features equivalent to the latest model launched in latest release in RSNA. The Unit should be completely integrated system (integrated X-ray generator and image acquisition control console).

Tube & detector must be manufactured by the principal vendor themselves.

The Detector and the Console software must be from the same manufacturer and integrated with the X-ray console.

The original data sheet of tube, generator, detector must be part of technical bid document.

It should have following specifications:

### 1. Generator

- a) 1000 mA unit with microprocessor controlled high frequency X-ray generator with power output of 80 KW or more
- b) The exposure range should be 40-150KV
- c) The minimum exposure time should be 1msec or less.
- d) Automatic exposure control function is an essential requirement.
- e) mA Output Should be 800mA @ 100 KV; 1000mA @80Kv or more

### 2. X-Ray Tube

- a) Should be ceiling suspended
- b) Tube should have at least 2 focal spots
  - Small focal spot should be 0.6 or less and large focal spot should be 1.3 or less
  - Tube loading should be at least 30 KW for small and at least 80 KW for large focus.
  - Should have motorized movement of ceiling suspended tube in all directions
- c) Should have electromagnetic locks with collision protection sensor.
  - Field size programming should be possible.
  - Anode heat storage capacity should be 400 KHU or more
- d) X ray tube and collimator section should have automated image shuttering and cropping facility in collimator.

Dr. Sukanti Kumar  
Professor Junior

Department of Radiology  
KGMU, Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCU  
Dr. RMLIMS, Lucknow

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## Specification for Digital Radiography System (1000 ma) with Two Flat Panel Detectors

- e) All the movements of the overhead tube suspension (3D column stand) and the chest stand (vertical detector) should be fully motorized. It should be possible to override it manually.
- f) There should be auto positioning of the overhead tube suspension against both the vertical detector and the table detector. This should be possible through selected protocol from the console using remote control.
- g) Tube tracking should be there in all axes
- h) Tube rotation: Vertical axis +/- 135 degrees, Horizontal axis +115/-115 degrees or better. Please specify rotation of your offered model.
- i) Should have motorized copper filter to avoid unwanted radiation
- j) Overhead tube suspension (3D column stand) should also have a touch screen with display of important parameters and controls. The tube head touch screen should enable following functionalities:

Touch screen control on tube head should have control of all essential parameters like SID, Kv, mA, collimation etc.

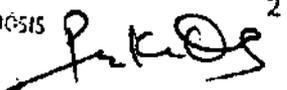
Patient demographic data like name, gender etc display on tube head screen should be displayed each time before examination to avoid mix up of patients in a heavy workload environment

### 3. Horizontal Bucky Table

- a) Motor driven, adjustable height floating tabletop of carbon fiber or equivalent material.
- b) Compact bucky table with integrated built-in digital flat panel detector.
- c) Foot switches for adjusting height, longitudinal/side to side movements, locking.
- d) Detector movement should be synchronized with movement of the X-Ray tube.
- e) Tube movement should be synchronized with the table so that the SID is maintained automatically
- f) Removable grid for SID of 100cms for horizontal table applications
- g) Automatic exposure control should be available
- h) Table should support patient weight of at least 200Kg.

### 4. Vertical Bucky (Wall stand)

  
Dr. Sukhvir Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Specification for Digital Radiography System (1000 ma) with Two Flat Panel Detectors

- a) Motorized, counter balanced adjustable height vertical Bucky with integrated built-in digital flat panel detector.
- b) Should be possible to tilt the Vertical detector system (-20° to + 90°)
- c) Should be able to travel vertically from 15 inches to 60 inches above floor level
- d) Detector movement should be synchronized with movement of the X-Ray tube in all planes.
- e) Removable grid for SID of 180cms for vertical bucky applications
- f) Automatic exposure control should be available

### 5. Detector System

- a) Two Digital flat panel detector systems with detector integrated into the wall stand and integrated for Bucky table. (total of 2 separate detectors). The detector should have a non-tiled CSI scintillator on the tube side and amorphous silicon photo diode array behind.
- b) Minimum size of detector should be 43cms X 43 cms or more for integrated detector. Vendor should also offer any other smaller size detector for pediatric patients as an option. Please quote its price separately in the price bid.
- c) Image matrix size 2.8k x 2.8k pixels or more.
- d) Pixels size should be 150p.m or less
- e) Image resolution should be 3.3 lp/mm or more
- f) DQE of detector system should be 70% or more at 0 lps/mm or more
- g) Tube assembly movement to be automatically synchronized with both the horizontal and vertical detectors movement
- h) MTF at 80% @ 1lp/mm
- i) Detector should be dust and water resistance with IP54/ IPX3 rating

### 6. Operating (acquisition) Station

- a) Both Manual and Automatic Facility for data input from RIS/HIS via DICOM.
- b) Should have high resolution TFT/LCD monitors of minimum 21" size or more (fully flat) with minimum 1024x1024 or more display matrix and antireflective front screen.
- c) Image acquisition matrix should be minimum of 2k x 2K
- d) System should have auto protocol select

Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

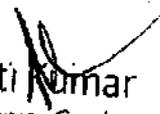
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

### Specification for Digital Radiography System (1000 ma) with Two Flat Panel Detectors

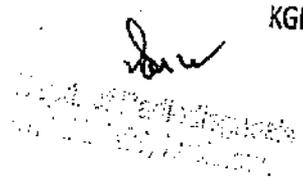
- e) Operating console should have facility for patient identity entry, viewing and processing images, documentation.
- f) Preview image should be ready in 5 sec or less
- g) Ortho Stitching should be available in vertical stand as well as on the table. The stitching should be automated. Stitching should be possible on main system. There should be in built measurement scale. The automated sticking should use rotational stitching method or equivalent.
- h) The console should have automatic program to indicate over /under exposure visually in the preview screen. It should be able to indicate the exposure on the flat panel comparing the Target Exposure Index (TEI) so that the radiographer can clearly understand if the image is over exposed or underexposed
- i) Latest generation processor with 16GB RAM
- j) The operating system should be latest platform only with latest security features

#### 7. Image Viewing, Post Processing and reporting Station and Documentation

- a) An Independent Workstation with all post processing and printing facility should be quoted with storage capability of 10,000 or more images with ability to review and report X Rays independent of main console.
- b) High speed intel Xeon processor based (Z400 workstation) CPU (3.0 GHz or higher processing speed) with post processing capability
- c) 16 GB RAM or more
- d) Should have its independent memory and hard disk of at least 1TB
- e) Should have a high-resolution medical grade LCD colour monitor of 19" or more.
- f) Should have independent monitor of high resolution TFT/LCD monitor of 19" or more.
- g) Image display matrix should be of high resolution, minimum of 1.5 K x 1.5 K
- h) Post acquisition image processing, viewing, reprocessing, hard copy documentation and onward transmission should be possible.
- i) Image processing functions like rotate, mirroring, zoom, move, and windowing filter should be possible.
- j) There should be facility for measurements.

  
 Dr. Sukriti Kumar  
 Professor Junior Grade  
 Department of Radiodiagnosis  
 KGMU, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
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### Specification for Digital Radiography System (1000 ma) with Two Flat Panel Detectors

- k) Should be connected to a Dry chemistry Camera of 500 DPI or more for documentation. The camera should accept all size films upto 14"x17" size (three film size trays should be active).
- l) Multiformat printing should be possible with user selectable options.
- m) Work list should be auto refreshing

#### 8. Image Storage and Transmission

- a) Acquisition system should have hard disc storage capacity should be of 10000 or more images and Additional post processing Workstation should have storage capacity of 10,000 images or more.
- b) The systems should support storage of images on compact discs and DVD
- c) The system should be DICOM 3.0 (or higher version) ready (like send, receive, print, record on CD/DVD, acknowledge etc.) for connectivity to any network, computer/PC etc. in DICOM format.
- d) Integration and networking should be possible with any other existing/future networking including other modalities, HIS and RIS and PACS. Vendor will connect it to existing RIS PACS network without extra cost for existing and future networking.

#### 9. Accessories to be supplied with system

- a) Dry Laser camera should print at least 3 sizes of films online out of 8x10, 10x12, 10x14, 11x14, and 14x17 inches. 14 x 17 inch film size is mandatory.
- b) Suitable Online UPS with 15 min Back up to be supplied with system.
- c) Light weight zero lead radiation protection apron (lead equivalent 0.5mm) lead -2 Nos. with stand and hanger
- d) Gonad shield (2no.), Thyroid shield (2 Nos.)
- e) LED X-ray Film viewer with adjustable brightness: capable of holding 4 films of 14"x17" size
- f) Lead Glass 100 cm x 100 cm
- g) Suitable Voltage Stabilizer for the DR system should be supplied
- h) Compression belt for IVP

#### 10. Installation:

Dr. Sukriti Kumar  
 Professor Junior Grade  
 Department of Radiodiagnosis  
 KGMU, Lucknow

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*[Signature]* 5  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCU  
 Dr. RMLIMS, Lucknow

6 > >

## Specification for Digital Radiography System (1000 ma) with Two Flat Panel Detectors

- a) Installation to be done on turnkey basis. The installation and commissioning of the new machine shall be free. The site can be seen by the vendor and room plan Lay out to be submitted along with Bid. Flooring, wall furnishing, radiation shielding, limited civil and electrical work will be included.
- b) Appropriate structural shielding/ lead equivalent shall be provided for walls, doors, ceiling and floor of the room housing the X-ray equipment so that radiation exposures received by workers and the members of the public are kept to the minimum and shall not exceed their respective dose limits (as per the AERB). The lead glass size between the machine room and the console should be at least 100 x 100 cms.
- c) The vendor/OEM shall provide a written undertaking that OEM shall be responsible for the decommissioning as per the AERB norms of the machine at the end of its life, free of cost. In the event that the OEM/vendor merges with another company or shuts down during the warranty or CMC period, the successor company Shall assume full responsibility for the decommissioning at no additional cost.
- d) Footstep for patients: 2
- e) Examination Stool – 1
- f) Name Boards for all rooms and AERB based radiation related signage
- g) Fire extinguishers 2 no's 5 Kg ABC type to be provided.
- h) Split/Windows air conditioners may be used according to room requirement & suitability. Humidity control should be effective to eliminate moisture condensation on equipment surface.
- i) It is the vendor's responsibility to ensure that all cables are properly sealed to prevent any rodent related damage, and that the outdoor unit of the AC is adequately covered.
- j) A set of one table and 4 movable chairs (Godrej/ zeeken/ equivalent) for operator/ workstation
- k) Operating manual

### 11. Others:

- a) The offer should be accompanied by the original product data sheet and brochure of the product tube and generator and detector.
- b) The AERB type approval certificates must be submitted at the time of bid submission.
- c) The X-ray unit should be approved by CE with 4 digits notified body number / USFDA/ BIS &

Dr. Sukriti Kumar

Professor Junior Grade

Department of Radiodiagnosis

KGMU, Lucknow

6

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCU  
Dr. RMLIMS, Lucknow

## Specification for Digital Radiography System (1000 ma) with Two Flat Panel Detectors

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- d) QA test should be done free of cost during the warranty period, QA test shall be done in the CMC period, and the rates shall be included in the CMC offered.
- e) The manufacturing firm should be ISO 13485: 2016 & ISO 9001:2015 approved.
- f) The firm should have a service center in the state to ensure prompt after-sales service.
- g) The manufacturer should have a toll-free call center for logging service requests.

  
Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLHMS, Lucknow

  
Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

## Digital Radiography Fluoroscopy System with Flat Panel Detector

1. At least two out of three component i.e. X-Ray Tube, X-Ray Generator and Flat Panel Detector should be manufactured by the OEM (Original Equipment Manufacturer) of the Quoted Model to facilitate proper service back up.
2. The make & Model of X-Ray Generator, X-Ray Tube & Flat Panel Detector should be clearly mentioned in the Compliance & Technical offer along with details in the Product Datasheet otherwise bid will be technically rejected.
  - a) All information in the tender document must be supported in the product data sheet. Please attached the original manufacture's product catalogue and datasheets. Photocopied, computer generated catalogue and datasheet will not be accepted.
  - b) Compliance statement sheet must quote page number/s as it appears in the product data sheet enclosed by the vendor. Failing to quote relevant page numbers in product data sheet may lead to disqualification of the vendor bid.
  - c) All hardware, software, networking and electric material for unit functionality to be provided and covered in warranty and maintenance

The unit should have the following specifications

3. **X-Ray Generator and tube:**
  - a) 1000mA unit with microprocessor controlled high frequency with power output 80kW or more
  - b) Over the couch Grid Controlled X-Ray tube for fluoroscopy and spot radiography
  - c) Anode heat storage capacity of 700 KHU or more
  - d) Dual focal spot: larger 1.2 mm or lower and smaller 0.7 mm or lower size
  - e) Small focal spot power rating should be in the range 30-50kW. Large focal spot power rating should be in the range 70-90kW
  - f) Maximum tube current for radiography 1000mA or higher
  - g) Different GRID Controlled Pulsed fluoroscopy modes for different anatomical regions. System should preferably have automatic brightness stabilization
  - h) Cineradiography should be possible (mention the frame rate), in addition to dynamic fluoroscopy image series capture.
  - i) The tube head should mandatorily consist of integrated camera with bird's eye view for correct collimation and patient positioning which helps to reduce retakes due to patient movement. The live image should be visible in console room on the main workstation.
  - j) Motorized copper prefiltration with at least 3 filter thickness, facility for automatic selection by patient's
  - k) X-Ray tube unit should have oblique angle range for cranio-caudal tilt
  - l) Collimator should have rectangular configuration
  - m) Asymmetrical collimation on either the left or right side
  - n) Virtual collimation
  - o) Table should have adjustable height with minimum height of 50 cm or less for elderly and frail patients transferred or dismantled easily.
  - p) Generator should have minimum exposure time of at least 1ms
4. **Remote Controlled R/F Table**
  - a) Floor mounted table with radiolucent tabletop with scratch free surface

  
Dr. Sumit Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Digital Radiography Fluoroscopy System with Flat Panel Detector

- b) Table should support patient of at least 200 kg or more in all positions
  - c) System should have motor driven fast longitudinal (Tabletop Movement/Imaging Chain Movement), horizontal, angulatory movements with electromagnetic brakes
  - d) Total patient coverage of 2 meter without repositioning the patient.
  - e) Table should have a sturdy removable footboard to support patients in tilt position
  - f) Table tilting range of +90 degree and at least -90 degree
  - g) Table should be equipped with tilting safety and anticollision measures
  - h) Lateral slide of tabletop should be 25 cm in your offered model
  - i) Table should have controls of all table movements, table elevation, x-ray unit including movement, tilt. Magnification & collimation should be available on the In Room Console
  - j) Foot Switch for moving Imaging Chain for Urology Cases
  - k) Table should have a variable height for easy patient transfer. Please specify vertical range of movement in your offered model- TO BE DELETED (REPEAT)
5. **Detector system with RF unit**
- a) Fully digital dynamic flat panel detector system. (not a CCD based system) with Cesium Iodide Scintillator or equivalent material
  - b) Detector size of at least 17" x 17" or more, with pixel pitch of 160 micron or less.
  - c) There should be AEC control for fluoroscopy and radiography, it should be possible to override AEC if required. Automatic selection of kV and mAs according to patient habitus.
  - d) The detector should have DQE of at least 65% or more @0.5lp/mm
  - e) The system must have a dose monitoring device in the beam path. Company must offer a model for deriving the patient dose or effective dose from the dosimeter reading.
  - f) System should have high quality removable grid or with grid parking facility.
6. **Image display monitor for examination room** : Ceiling mounted or movable trolley dual quality LCD monitors, each 19 inch size of 1 megapixel or more resolution, one displaying the reference image and other for current image/fluoroscopy.
7. **Console Control and console monitor including necessary hardware and software**
- a) High quality 19 inch LCD console monitor of 1 megapixel or more with English keyboard and mouse.
  - b) User friendly remote control console for easy access to all parameters with touch screen for console room.
  - c) Patient data entry, examination control, image post processing, image storage, image retrieval, printing, retrospective data editing all should be possible from the control console.
  - d) Adjustable preset exposure parameters of organ programs should be available to suit various patient types, including paediatric age group.
  - e) System should be DICOM Worklist, MPPS, DICOM Query, Retrieve CD/DVD drive, DICOM print enabled.

Dr. Sukrit Kumar  
Professor Junior Grade

Department of Radiodiagnosis.  
KGMU, Lucknow

Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

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## Digital Radiography Fluoroscopy System with Flat Panel Detector

- f) System should be seamlessly integrated with existing HIS/RIS and PACS at no extra cost.
- g) Registration via DICOM Worklist or manually at the system, postprocessing, including image cropping, edge enhancement, magnification, contrast brightness adjustment, labelling and accurate distance and angle measurements. Multiple format printing should be possible.
- h) Facility of prospective and retrospective storage of fluoro loop
- i) Automatic Stitching for Long Length Imaging. It should be able to measure Distance, Angle, & Cobb angle
- j) Collimator positioning should be possible without radiation using the last image hold up
- k) System should store at least 30,000 images of at least 1k x 1k matrix out of 30000 images at least 10000 images must be stored in on main system disc
- l) Dose reduction software should be available, mainly for thin and paediatric patients
- m) Exposure dose level should be displayed on the monitor in Real Time
- n) DICOM Radiation Dose Structured Report with dose information to be able to send to the network.
- o) DVD-R burning facility with software for easy viewing on any ordinary computer
- p) Remote diagnostics should be provided by the company including internet connectivity during the Warranty & CMC period
- q) Antivirus software to be provided during warranty & Comprehensive maintenance contract period

### 8. Accessories

- a) Online UPS with voltage stabilizer for at least 30 minutes back up for computer system. Appropriate KVA voltage stabilizer for entire unit
- b) Integrated Compression device (OEM)
- c) Radiation protection apron (BIS/ US FDA Approved/ European CE; Lead Free ultra-light weight) of high quality with hangers: (Total quantity 5: Front type- 3 Wrap around - 1 Two Piece type-1) it should be state of art light weight with a lead equivalent of 0.5 mm
- d) Two wall mounted hangers to hold 5 aprons each.
- e) Thyroid guards 3 in number with lead equivalent of 0.5 mm
- f) Lead spectacles 3 in numbers.
- g) Lead lined gloves: Two Pairs
- h) Gonad shield adult light weight (1), Gonad shield child light weight (1)
- i) LED x-ray film viewer with adjustable brightness capable of holding 3 films of 14" x 17" size
- j) Foot switch for fluoroscopy and spot films (OEM) 1 nos
- k) IV stand preferably should attach to table 1 nos
- l) Lead Glass for console room(3ft x 3ft atleast) to meet AERB requirements
- m) Soft head support (2)
- n) Belt compression device with a radiolucent belt for IVU (OEM) 1 nos

Dr. Suniti Kumar

Professor Junior Grade

Department of Radiodiagnosis

KGMU, Lucknow

Prof. P.K. Das

Professor & Head

Dept. of Anaesthesiology & CCM

Dr. RMLIMS, Lucknow

## Digital Radiography Fluoroscopy System with Flat Panel Detector

- o) Medical step stool for patient 1 nos. Cloth Hanger for patient
- p) One Dry Laser printer of at least 580 DPI. It should be DIOCOM ready and should be provided with multiple film tray sizes. At least three sizes of online film trays should be active (14"x17", 11"x14" and 8"x10"). The vendor should connect this printer with other existing DIOCOM equipment's in the Department with 10 packs of 17" x 14" films.
- q) Handgrips on table for patient (OEM) 1 nos
- r) Patient positioning mattress (OEM) 1 nos
- s) Footstep for patients: 2
- t) Intercom system for communication between the examiner and the patient (both way) (OEM)
- u) Removable lead flaps which can be inserted into the accessory rails of the primary collimator/X-Ray Tube Housing
- v) Lateral radiation protector (Ceiling Mounted Lead Radiation Protection Glass)
- w) Movable control console for examination room
- x) Additional work station with DICOM compatibility with 21 inch monitor for review and reporting with a storage of at least 1TB SSD hard disc.

### 9. Standards, Safety & other requirements

- a) Entire unit should be USA-FDA/ European CE (notified body) approved
- b) Electrical safety conforms to international standards for electrical safety
- c) System should be fitted with Indian plugs and operate with existing electricity supply in department
- d) The system should be AERB type approved and the copy of E-LORA Listing should be submitted along with bid.
- e) QA test should be done free of cost during the warranty period, QA test shall be done in the CMC period, and the rates shall be included in the CMC offered.
- f) The firm should have a service centre in the state to ensure prompt after-sales service.
- g) The manufacturer should have a toll-free call centre for logging service requests.

### 10. Installation: Turnkey

- a) Installation to be done on turnkey basis. The installation and commissioning of the new machine shall be free. The site can be seen by the vendor and room plan Lay out to be submitted along with Bid. Flooring, wall furnishing, radiation shielding, limited civil and electrical work will be included.
- b) Appropriate structural shielding/ lead equivalent shall be provided for walls, doors, ceiling and floor of the room housing the X-ray equipment so that radiation exposures received by workers and the members of the public are kept to the minimum and shall not exceed their respective dose limits (as per the AERB). The lead glass size between the machine room and the console should be at least

Dr. Sukhvikumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

Dr. P. K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

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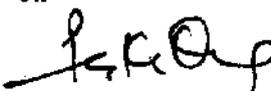
## Digital Radiography Fluoroscopy System with Flat Panel Detector

- c) The vendor/OEM shall provide a written undertaking that OEM shall be responsible for the decommissioning as per the AERB norms of the machine at the end of its life, free of cost. In the event that the OEM/vendor merges with another company or shuts down during the warranty or CMC period, the successor company shall assume full responsibility for the decommissioning at no additional cost.
- d) Name Boards for all rooms and AERB based radiation related signage
- e) Fire extinguishers 2 no's 5 Kg ABC type to be provided.
- f) Split/Windows air conditioners may be used according to room requirement & suitability. Humidity control should be effective to eliminate moisture condensation on equipment surface.
- g) It is the vendor's responsibility to ensure that all cables are properly sealed to prevent any rodent related damage, and that the outdoor unit of the AC is adequately covered.
- h) Two executive type office chair, Two table for computer system, one trolley for consumables and emergency drugs from reputed make like Godrej etc.
- i) Operating manual

### 11. Others:

- a) The offer should be accompanied by the original product data sheet and brochure of the product tube and generator and detector.
- b) The AERB type approval certificates must be submitted at the time of bid submission.
- c) The X-ray unit should be approved by CE with 4 digits notified body number / USFDA
- d) QA test should be done free of cost during the warranty period, QA test shall be done in the CMC period, and the rates shall be included in the CMC offered.
- e) The firm should have a service centre in the state to ensure prompt after-sales service.
- f) The manufacturer should have a toll-free call centre for logging service requests.

  
Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Basic Color Doppler Ultrasound Equipment

- 1) The system must be state of the art with fully digital technology equipment to incorporate the facility of 2D, M-Mode, Colour Doppler Imaging, PW Doppler, CW Doppler, Power Doppler, Directional Power angio, Contrast Imaging, Elastography imaging, Real time 3-D(4-D), Imaging for abdomen, obstetrics & Gynae, Cerebrovascular, peripheral vascular, adult trans-cranial & superficial parts imaging like breast, scrotum, thyroid, musculoskeletal application
- 2) System should have minimum 4.5 million digital processed channels.
- 3) System should have high dynamic range of at least 275 dB to pick up subtle echoes. Dynamic range in dB must be mentioned in the technical quote and supported with technical data sheet. System offered lesser dynamic range than specified will not be consider.
- 4) System should have 21" or more High-Resolution Flat Panel /LCD/LED monitor or better.
- 5) System should have at-least four Imaging universal active probe ports with electronic switching facility from keyboard.
- 6) Operating modes B-mode, M-Mode, B/M Mode, Doppler Mode, Colour flow, Power Doppler,
- 7) DCA/DPA, B/color flow, PW Doppler, Real time 3D ( 4-D imaging).
- 8) System should support broad band probes spanning a frequency of 1-18 MHz
- 9) B mode & B color simultaneous should be available side by side real time display of B-Mode & color flow. Digital zoom facility for region of interest in real time and frozen images.
- 10) Image storage facility on in build hard disc or MOD/CD/DVD-RW facility should be available. In built hard disk with minimum capacity of 500 GB. System should have extensive image management capability including thumb nail review, Cine loop editing etc.
- 11) Cine loop as well as cine scroll facility in B mode with storage of 800 or more images should be available. Cine loop frames should also be available for abdominal contrast applications
- 12) Should have the state of the art Transmit Real Time Compound Imaging Technology with Multiple transmitted lines of sight, wherein Multiple Coplanar Images from different

Dr. Sukanti Kumar

Professor Junior Grade

Department of Radiodiagnosis

KGMU, Lucknow

Prof. P.K. Das

Professor & Head

Dept. of Anaesthesiology & CCU

Dr. RMLIMS, Lucknow

## Basic Color Doppler Ultrasound Equipment

- viewing angles are obtained and combined into a single compound Image at real-time frame rates for improved visualization. Should demonstrate and show multiple transmitted line of sight in convex, linear and Endo cavity probes.
- 13) System must be offered with Speckle Reduction Imaging: Image processing technique to remove speckles and clutter artifacts
  - 14) Advanced measurements & calculation package for abdominal, obs./gynae, and urology, vascular, ortho should be available.
  - 15) System should be capable of scanning depth of 40cms or more depending upon selected transducer.
  - 16) System should have minimum 12inch high resolution user interface touch panel. Touch screen should enable easy navigation of controls and system interaction, Dual function mode switch and independent gain controls, for 2D, CPA, M-mode, Color, PW, CW Doppler, TDI, and 3D, measurement, annotation.
  - 17) System should have high 2D frame rate of at least 1900 frames/second. Acquisition frame rate should be mentioned in the technical quote If not mentioned. Please attach a letter from manufacturer along with the technical bid clearly stating the frame rate of the offered system.
  - 18) The system should have Contrast Harmonic Imaging and should have optimization settings to detect the Contrast Agents. Please specify other advanced Technologies to perform better Contrast Harmonic Imaging.
  - 19) Automatic real time & frozen tracing of instantaneous peak velocity & instantaneous mean velocity (or frequency) should be available. Triplex Imaging should be standard on the system.
  - 20) The System should have Panoramic imaging / Sie-scape and extended field of view imaging.
  - 21) The System should have strain based Elastography accompanied by quantification package software. One touch entry into Elastography mode.
  - 22) The System should have Fetal Heart STIC imaging. Fetal Echo facility must be part of system.
  - 23) Warranty and CMC price should be offered on Manufacturer letter head with undertaking "Manufacture will be responsible for warranty and CMC"

Dr. Sukh Kumar

Professor Junior Grade

Department of Radiodiagnosis

KGMU, Lucknow

Prof. P.K. Das

Professor & Head

Dept. of Anaesthesiology & CCM

Dr. RMLIMS, Lucknow

## Basic Color Doppler Ultrasound Equipment

- 24) Certification: System should be USFDA/ European CE from notified body approved.
- 25) System should offer with following transducers (Upto 2MHz wider bandwidth is acceptable or maximum up to 1 MHz narrow at one end) and accessories
- 1-5 MHz single crystal Broadband Convex Transducer for General Imaging, Abdomen, Renal, OB/GYN imaging. Must have Tissue Harmonic Imaging for excellent Image quality on Difficult to image patients.
  - 4-9 MHz Endocavity Transducer with minimum 180 degrees field of view. Must have Tissue Harmonic Imaging for excellent Image quality.
  - 4-12 MHz Linear Array Transducer for carotid, peripheral vascular, intervention, bowel, MSK and small parts, superficial imaging applications
  - B&W Thermal Printer with each System
  - 2 KVA online UPS. with each System

*[Signature]*  
 Dept. of Radiodiagnosis,  
 KGMU, Lucknow.

*[Signature]*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow.

*[Signature]*  
 Dr. Sukriti Kumar  
 Professor Junior Grade  
 Department of Radiodiagnosis  
 KGMU, Lucknow

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## Mid End Color Doppler Ultrasound Equipment

A state of art fully digital Color Doppler Ultrasound machine is required for abdominal, obstyene, MSK, pediatric, cardiac (adult/ pediatric), intraoperative, orthopedic applications. System should support adult, pediatric and neonatal cardiac probes, and biplane transducer with convex/convex firing for transrectal examinations.

Technical specifications:

### 1. Display and User Interface

- a) Monitor size should be at least 23 inches.
- b) The system should feature a touchscreen of more than 15 inches.
- c) The system must have more than four probe port connectors.

### 2. Imaging Capabilities

- a) The machine should support 3D/4D scanning and advanced 3D/4D imaging features, such as Whiz Render Live, Whiz Follicle, VLive 2.0 or equivalent
- b) The system should be able to pick micro vessel flow using a non-doppler technology
- c) It should have the capability to scan large organs up to 60 cm in a single stretch.
- d) It should provide real-time dynamic tissue and doppler optimization for enhanced scan quality.
- e) It should support strain elastography for assessing tissue stiffness.
- f) The system should support TVI (Tissue Velocity Imaging), AMM (Anatomical M-Mode), Auto EF (Ejection Fraction), and Stress Echo for cardiac scanning.

### 3. Data Processing and AI Integration

- a) The system must allow post-scan image raw data processing.
- b) It should provide scan follow-up functionality, enabling comparison of current scans with previous scans of the same patient.
- c) The system should support real-time automatic Doppler calculations.

### 4. Image Optimization and Storage

*[Signature]*  
Dr. Sudhakar Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

*[Signature]*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RML

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## Mid End Color Doppler Ultrasound Equipment

- a) The system should feature a one-touch shift between Smooth Mode and Sharp Mode for improved image viewing.
- b) It must have the capability to store voice-over recordings along with images.
- c) Strain elastography should be available with linear probe, TVTR probe and convex

### 5. Connectivity and Performance

- a) The system should support DICOM 3.0 connectivity.
- b) Frame rate should exceed 1700 frames per second (FPS).
- c) Maximum depth of field should range between 1 cm to 50 cm.
- d) The system should support Digital Quad Beamforming.
- e) Frequency range capability should be 2 – 20 MHz or wider.

### 6. Probe Compatibility (all probes should be supplied with reusable biopsy guides and the full calculation package of the application should be standard features of the system). Transducers and other accessories to be supplied as standard. (Frequency bandwidth required can be wider up to 2MHz or narrower at one end of width by not more than 1MHz)

- a. 2 to 5 MHz multi frequency broadband curved array transducer for abdominal, OB/GYN, vascular, urological, thoracic, pediatric, and MSK
- b. 4 to 13 MHz multi frequency broadband linear array transducer for vascular, small parts, pediatrics, MSK, and thoracic
- c. 4 to 10 MHz multi frequency broadband curved array transvaginal transducer for OB/GYN

7. **Printer:** System should be provided with black and white thermal printer, and 50 pieces of ultrasound gel

8. **UPS:** System should be provided with adequate rating online UPS with battery backup of 30 minutes for entire system

9. System should be USFDA/ European CE from Notified body approved.

### 10. Others:

- a) On site product training must be provided post installation of the system

Dr. Sukriti Kumar

Professor Junior Grade

Department of Radiodiagnosis

KGMU, Lucknow

Prof. P.K. Das

Professor & Head

Dept. of Anaesthesiology & CCM

Dr. RMLIMS, Lucknow

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**Mid End Color Doppler Ultrasound Equipment**

b) Any breakage/damage during supply will be replaced by a new instrument. No repair will be accepted. Certified packaging list of equipment with accessories should be available with delivery.

**11. Optional Probes:**

- a. Phased array transducer with frequency range between 1 to 4 (+/-1) MHz for Transcranial doppler and cardiac Examination biopsy
- b. Broadband linear array hockey stick transducer with operating frequency of 2 to 16 (+/-1) MHz
- c. 2 - 8 MHz (+/-1) Broadband Pediatric Cardiac Probe
- d. 2 - 12 MHz (+/-1) Broadband Neonatal Cardiac Probe
- e. 2 - 11 MHz (+/-1) Broadband Micro Convex Probe
- f. 2 - 8 MHz (+/-1) Broadband Convex Volume Probe
- g. 4 - 10 MHz (+/-1) Broadband TV/TR Volume Probe
- h. 2 - 8 MHz (+/-1) 2D Adult TEE probe

  
Dept. of Radiodiagnosis,  
KGMU, Lucknow.

  
**Dr. Sukviti Kumar**  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

  
**Prof. P.K. Das**  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

# Mid End Color Doppler Ultrasound Equipment

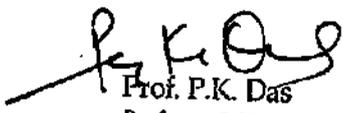
## Annexure: I

Optional Probes if needed budgetary allocation should be done approx....

- i. Phased array transducer with frequency range between 1 to 4 (+/-1) MHz for Transcranial doppler and cardiac Examination biopsy – 4,00,000
- j. Broadband linear array hockey stick transducer with operating frequency of 2 to 16 (+/-1) MHz – 5,00,000
- k. 2 – 8 MHz (+/-1) Broadband Pediatric Cardiac Probe – 4,00,000
- l. 2 – 12 MHz (+/-1) Broadband Neonatal Cardiac Probe – 5,00,000
- m. 2 – 11 MHz (+/-1) Broadband Micro Convex Probe – 4,00,000
- n. 2 – 8 MHz (+/-1) Broadband Convex Volume Probe – 4,00,000
- o. 4 – 10 MHz (+/-1) Broadband TV/TR Volume Probe – 5,00,000
- p. 2 – 8 MHz (+/-1) 2D Adult TEE probe – 17,00,000

  
Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow.

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Upper Mid End Color Doppler Ultrasound System with Real Time 2D Shear Wave Elastography

1. The equipment must be capable of operating in B, M, Doppler, Color flow and Power Doppler modes, Contrast microbubble ultrasound & 3D / 4D Volume Scanning, Real time 2D Shear Wave elastography, Liver Fat Quantification and Fusion capabilities.
2. It should support transducers with Single crystal, XDclear and Matrix technology. Further, it must include a full array of measurement and calculation packages. The specific minimum requirements for this equipment are as follows
3. System should have the latest technology to eliminate manual focus position and automatically focus the entire field of view on all the probes.
4. User Interface & Ergonomics.
  - a) The console should have height & rotation option
  - b) The system shall include at least a 23" LED/LCD/OLED/HDU monitor.
  - c) The monitor shall be mounted on an articulating arm that moves side-to-side, forward, and backward.
  - d) The system should have a touch panel of 12" or more
  - e) The system shall have minimum Four active universal probe ports
5. Productivity
  - a) The system shall offer an extended field-of-view imaging that operates by sweeping a transducer over the anatomy of interest up to 160 cm. This mode shall build the extended field-of-view in a real-time manner, showing the image as it builds.
  - b) System shall have image management features that store images by patient and include the ability to review images from different exam dates.
  - c) System shall support the ability to store digital data in, that allows to optimize imaging parameters such as B Gain, TGC, Color Gain, Dynamic Range, Speckle Reduction levels, Doppler Gain, Doppler Base Line on old Images & old loops recalled from the image archive.
  - d) System shall allow for live image and archive images side-by-side or quad display on a single monitor. This display shall allow any type of image – B-Mode, Color, or power Doppler on either side.
6. Workflow
  - a) Shear Wave Elastography with color coded adjustable box and quality indicator should be available in Convex, Linear Probe & TV/TR Probes, also measurement should be

Dr. Sukri Kumar

Professor Junior Grade

Department of Radiodiagnosis

KGMU, Lucknow

Prof. P.K. Das

Professor & Head

Dept. of Anaesthesiology & CCM

## Upper Mid End Color Doppler Ultrasound System with Real Time 2D Shear Wave Elastography

available in Kpa & m/s simultaneously. A maximum number of 10 or more measurements should be taken in 1 single frame. Offline measurements of Shearwave elastography should be possible.

- b) System should be capable to quantify liver steatosis to aid in early identification and monitoring of patients with NAFLD, NASH or ASH. Units should be in dB/m & dB/cm/MHz
  - c) System should have the capability to integrate both Shearwave elastography & fat quantification tools for better workflow
  - d) System should be Fusion, Navigation ready for future upgrades with built in sensors & Auto registration feature for end user comfort.
  - e) Contrast Ultrasound Capability (CEUS) with Times Intensity Curve Graphs with Convex, Linear, TV/TR,. Full calculation package on system. Software for calculation should be provided in a separate workstation (In addition to the USG machine) to increase the workflow. Both hardware and software should be part of the supply.
  - f) System should have the capability to compare previous patient images during live scan
  - g) System should have the capability to pick micro vessel flow using a non doppler technology.
  - h) System should have the capability to pic blood flow signals in gray scale imaging throughout in entire field of view (Scan Area) without using Doppler Technology this should display the true Hemodynamics. Also, this can be used side by side with B Mode
  - i) System should have the capability to measure the area of lesions/Cyst automatically
  - j) System should have an AI feature in doppler studies which automatically places the color box by understanding the location and direction of the vessels.
7. Data Processing.
- a) The system shall allow for post-storage image manipulation to provide maximum image flexibility, review and productivity. It shall include the ability to change all following on recalled old Stored Images/Loops:
    - i. Overall B-Mode gain, dynamic range and gray scale maps.
    - ii. Overall Doppler gain, base line shift, sweep speed and inverted spectral waveform.
    - iii. Anatomical M-Mode

Dr. Sukrit Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

# Upper Mid End Color Doppler Ultrasound System with Real Time 2D Shear Wave Elastography

- b) The system shall provide a display zoom function on frozen images.
- c) System should be offered with software beamforming technology such as cSound, nSight, or equivalent

## 8. Scanning Parameters

- a) The system should have Infinite number of effective processing channels
- b) The system shall possess the ability to control speckle through the use of a speckle reduction algorithm that enhances borders, reduces speckle artifact and improves detail and contract resolution in gray scale with compatibility in Color mode, 3D and side-by-side display. This feature shall have operator selectable settings and be capable of displaying in side-by-side mode with non-speckle reduced image.
- c) The system shall provide the ability to scan in the compound imaging mode
- d) The system shall provide scan depths from a minimum of 0 cm to a maximum of at least 100 cm.
- e) System Should have frame rate more than 2200 f/s
- f) System should have 256 gray shades
- g) B-Mode / M-mode Imaging
- h) The system shall provide the capability for coded tissue harmonic imaging on all offered transducers.
- i) Color flow/Bi -Directional Power Doppler/Pulse Wave Doppler
- j) Color flow/Microvascular flow/Power Doppler flow should display 3D effect

## 9. Measurements and Calculations

- a) Measurements should be possible on frozen images as well as on images recalled from the image archive.
- b) The system shall provide a comprehensive set of Renal, obstetrical and gynecologic calculations and vascular calculations with summary reports.
- c) Automatic measurements of Intima Media, NT & IT should be available to enhance accuracy & workflow

## 10. Image Archive and Networking

- a) The device should store images onto USB port storage device or SSD
- b) The system shall include at least 1TB HDD with 800GB space to store images.

Dr. Sukrit Kumar  
 Professor Junior Grade  
 Department of Radiodiagnosis  
 KGMU, Lucknow

*[Signature]*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

*[Faint stamp]*  
 Department of Radiodiagnosis  
 KGMU, Lucknow

## Upper Mid End Color Doppler Ultrasound System with Real Time 2D Shear Wave Elastography

c) The device should store images in DICOM, JPG, WMV and AVI formats for maximum flexibility.

d) DICOM Connectivity

### 11. Transducers

a) The system must be provided with the following transducers: (all the supplied transducers should be provided with reusable biopsy guide) and bandwidth can be wider by 2 MHz on either side and narrow by up 1 MHz on one end of width)

b) System should support Biplane transducer with Convex/Convex firing for transrectal examinations

c) System should be able to handle frequencies from 1-24 MHz

i. 1 – 6 MHz (+/-1) Broadband Single Crystal Convex Probe for Abdomen imaging with Shearwave Elastography

ii. 2 – 10 MHz (+/-1) Broad band – Single Crystal Linear probe for Abdomen, Vascular, Small Parts with Shearwave Elastography.

iii. 3 – 10 MHz (+/-1) Broad band – TV/TR Probe for Gynae Studies with Shearwave Elastography

iv. 6 – 20 MHz (+/-1) Broadband linear probe for MSK, Nerve and superficial applications (Hockey Stick)

12. **Printer:** System should be provided with black and white thermal printer, and 50 pieces of ultrasound gel

13. **UPS:** System should be provided with adequate rating online UPS with battery backup of 30 minutes for entire system

14. System should be USFDA/ European CE from Notified body approved.

### 15. Others:

a) On site product training must be provided post installation of the system

b) Any breakage/damage during supply will be replaced by a new instrument. No repair will be accepted. Certified packaging list of equipment with accessories should be available with delivery.

### 16. Optional Probes:

a. 6 – 15 MHz (+/-1) Matrix Linear Probe for Small Parts, MSK, Neonates & Pediatrics with Shear wave Elastography

Dr. Sukrit Kumar

Professor Junior Grade

Department of Radiodiagnosis

KGMU, Lucknow

Prof. P.K. Das

Professor & Head

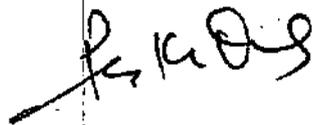
Dept. of Anaesthesiology & CCM

Dr. RMLIMS, Lucknow

**Upper Mid End Color Doppler Ultrasound System with Real Time 2D  
Shear Wave Elastography**

- b. 1 – 5 MHz (+/-1) Single Crystal Adult Cardiac Probe
- c. 2 – 8 MHz (+/-1) Broadband Pediatric Cardiac Probe
- d. 2 – 8 MHz (+/-1) Broadband Convex Volume Probe
- e. 3 – 10 MHz (+/-1) Broadband Convex TV/TR Probe
- f. 2 – 8 MHz (+/-1) 2D Adult TEE probe
- g. 4 – 15 MHz (+/-1) Broadband Hockey Stick Linear Probe
- h. 2 – 11 MHz (+/-1) Single Crystal Micro Convex Probe

  
Dr. Sukriti Kumar  
Department of Radiodiagnosis,  
KGMU, Lucknow.



Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

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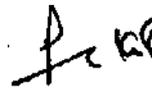
## Upper Mid End Color Doppler Ultrasound System with Real Time 2D Shear Wave Elastography

Annexure 1:

Note: Approx additional budgetary allocation if optional probes are chosen

6 – 15 MHz (+/-1) Matrix Linear Probe for Small Parts, MSK, Neonates & Pediatrics with Shearwave Elastography – 5,00,000
1 – 5 MHz (+/-1) Single Crystal Adult Cardiac Probe – 5,00,000
2 – 8 MHz (+/-1) Broadband Pediatric Cardiac Probe – 4,00,000
2 – 8 MHz (+/-1) Broadband Convex Volume Probe – 4,00,000
3 – 10 MHz (+/-1) Broadband Convex TV/TR Probe – 5,00,000
2 – 8 MHz (+/-1) 2D Adult TEE probe – 17,00,000
4 – 15 MHz (+/-1) Broadband Hockey Stick Linear Probe – 5,00,000
2 – 11 MHz (+/-1) Single Crystal Micro Convex Probe – 5,00,000

  
Prof. P.K. Das  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

# High End Color Doppler Equipment with Real time 2D Shear Wave Elastography

- I. The equipment must be capable of operating in B, M, Doppler, Color flow and Power Doppler modes, Contrast microbubble ultrasound & 3D / 4D Volume Scanning, Real time 2D Shear Wave elastography & Fusion capabilities.
- II. It should support transducers with Single Crystal and Matrix technology. Further, it must include a full array of measurement and calculation packages. The specific minimum requirements for this equipment are as follows
- III. System should have the latest technology to eliminate manual focus position and automatically focus the entire field of view on all the probes.
- IV. User Interface & Ergonomics
  - a. The console should have height & rotation option
  - b. The system shall include at least a 23" OLED/HDU monitor.
  - c. The monitor shall be mounted on an articulating arm that moves side-to-side, forward, and backward.
  - d. The system should have a touch panel of 12" or more
  - e. The system shall have minimum Four active universal probe Ports
- V. Productivity
  - a. The system shall offer an extended field-of-view imaging that operates by sweeping a transducer over the anatomy of interest. This mode shall build the extended field-of-view in a real-time manner, showing the image as it builds.
  - b. System shall have image management features that store images by patient and include the ability to review images from different exam dates.
  - c. System shall support the ability to store digital data in, that allows to optimize imaging parameters such as B Gain, TGC, Color Gain, Dynamic Range, Speckle Reduction levels, Doppler Gain, Doppler Base Line on old Images & old loops recalled from the image archive.
  - d. System shall allow for live image and archive images side-by-side or quad display on a single monitor. This display shall allow any type of image - B-Mode, Color, or power Doppler on either side.
- VI. Workflow

Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

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## High End Color Doppler Equipment with Real time 2D Shear Wave Elastography

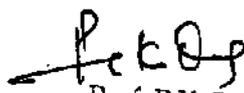
- a. Shear Wave Elastography with color coded adjustable box and quality indicator should be available in Convex, Linear Probe & TV/TR Probes, also measurement should be available in Kpa & m/s simultaneously. A maximum number of 10 or more measurements should be taken in 1 single frame. Offline measurements of Shearwave elastography should be possible.
- b. System should be capable to quantify liver steatosis to aid in early identification and monitoring of patients with NAFLD, NASH or ASH. Units should be in dB/m and dB/cm/MHz
- c. System should have the capability to integrate both Shearwave elastography & fat quantification tools for better workflow
- d. System should be Fusion/ Navigation ready for future upgrades with built in sensors & Auto registration feature for end user comfort.
- e. Contrast Ultrasound Capability (CEUS) with Times Intensity Curve Graphs. Full calculation package on system. Software for calculation should be provided in a separate workstation (In addition to the USG machine) to increase the workflow. Both hardware and software should be part of the supply.
- f. System should have the capability to compare previous patient images during live scan
- g. System should have the capability to pick micro vessel flow using a non doppler technology.
- h. System should have the capability to measure the area of lesions/Cyst automatically
- i. System should have an AI feature in doppler studies which automatically places the color box by understanding the location and direction of the vessels.

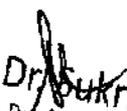
### VII.

#### Data Processing.

- a. The system shall allow for post-Storage image manipulation to provide maximum image flexibility, review, and productivity. It shall include the ability to change all following on recalled old Stored Images/Loops:
- b. Overall B-Mode gain, dynamic range and gray scale maps.



  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RML Hospital, Lucknow

  
Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

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## High End Color Doppler Equipment with Real time 2D Shear Wave Elastography

- c. Overall Doppler gain, base line shift, sweep speed and inverted spectral waveform.
- d. Anatomical M-Mode
- e. The system shall provide a display zoom function on frozen images.
- f. System should be offered with software beamforming technology, such as cSound, nSight, or equivalent

### VIII. Scanning Parameters

- a. The system should have minimum 10,000,000 digital system processing channels.
- b. The system shall possess the ability to control speckle through the use of a speckle reduction algorithm that enhances borders, reduces speckle artifact and improves detail and contrast resolution in gray scale with compatibility in Color mode, 3D and side-by-side display. This feature shall have operator selectable settings and be capable of displaying in side-by-side mode with non-speckle reduced image.
- c. The system shall provide the ability to scan in the compound imaging mode with up to 9 lines on all linear and convex probes.
- d. The system shall provide scan depths from a minimum of 2 cm to a maximum of at least 50 cm.
- e. System Should have frame rate more than 2800 f/s
- f. System should have 256 gray shades
- g. B-Mode / M-mode Imaging
- h. The system shall provide the capability for coded tissue harmonic imaging on all offered transducers.
- i. Color flow/Bi -Directional Power Doppler/Pulse Wave Doppler / simultaneous acquisition of at least two doppler waveform from two sample area in same frame.

### IX. Measurements and Calculations

- a. Measurements should be possible on frozen images as well as on images recalled from the image archive.

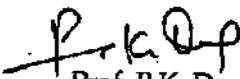
  
Dr. Sakriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## High End Color Doppler Equipment with Real time 2D Shear Wave Elastography

- b. The system shall provide a comprehensive set of obstetrical and gynecologic calculations and vascular calculations with summary reports.
- X. Image Archive and Networking
- The device should store images onto an integrated DVD-R Multidrive and a USB port storage device.
  - The system shall include at least 1TB HDD with 800GB space to store images.
  - The device should store images in DICOM, JPG, WMV and AVI formats for maximum flexibility.
  - DICOM Connectivity
- XI. Transducers
- System should be able to handle frequencies from 1-24 MHz
  - System should support Biplane transducer with Convex/Convex firing for transrectal examinations
  - The system must be provided with the following transducers: (all the supplied transducers should be provided with reusable biopsy guide) and bandwidth can be wider by 2 MHz on either side and narrow by up 1 MHz on one end of width)
    - 1 - 6 MHz (+/-1) Broadband Single Crystal Convex Probe for Abdomen imaging with Shear wave Elastography
    - 2 - 10 MHz (+/-1) Broad band - Single Crystal Linear probe for Abdomen, Vascular, Small Parts with Shear wave Elastography
    - 6 - 15 MHz (+/-1) Matrix Linear Probe for Small Parts, MSK, Neonates & Pediatrics with Shearwave Elastography
    - 6 - 20 MHz (+/-1) Broadband linear probe for MSK, Nerve and superficial applications (Hockey Stick)
    - 3 - 10 MHz (+/-1) Broad band - TV/TR Probe for Gynae Studies with Shear wave Elastography
  - Optional Probes
    - 1 - 5 MHz (+/-1) Single Crystal Adult Cardiac Probe
    - 2 - 8 MHz (+/-1) Broadband Pediatric Cardiac Probe

  
 Dr. Sukriti Kumar  
 Professor Junior Grade  
 Department of Radiodiagnosis  
 KGMU, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anesthesiology & CCM

677  
**High End Color Doppler Equipment with Real time 2D Shear Wave  
Elastography**

3. 2 - 8 MHz (+/-1) Broadband Convex Volume Probe
  4. 3 - 10 MHz (+/-1) Broadband Convex TV/TR Probe
  5. 2 - 8 MHz (+/-1) 2D Adult TEE probe
  6. 4 - 15 MHz (+/-1) Broadband Hockey Stick Linear Probe
  7. 2 - 11 MHz (+/-1) Single Crystal Micro Convex Probe
- XII. Should be supplied with B&W Thermal Printer
- XIII. Should be Supplied with Suitable UPS for 30mins backup
- XIV. The system should be USFDA and European CE certified.

*[Signature]*  
Dept. of Radiology, etc.  
RMLIMS, Lucknow.

*[Signature]*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

*[Signature]*  
Dr. Sukma Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

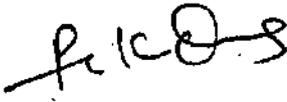
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## High End Color Doppler Equipment with Real time 2D Shear Wave Elastography

Annexure: Approx additional budgetary allocation if optional probes are chosen

- a. 1 – 5 MHz (+/-1) Single Crystal Adult Cardiac Probe – 5,00,000
- b. 2 – 8 MHz (+/-1) Broadband Pediatric Cardiac Probe – 4,00,000
- c. 2 – 8 MHz (+/-1) Broadband Convex Volume Probe – 4,00,000
- d. 3 – 10 MHz (+/-1) Broadband Convex TV/TR Probe – 5,00,000
- e. 2 – 8 MHz (+/-1) 2D Adult TEE probe – 17,00,000
- f. 4 – 15 MHz (+/-1) Broadband Hockey Stick Linear Probe – 5,00,000
- g. 2 – 11 MHz (+/-1) Single Crystal Micro Convex Probe – 5,00,000

  
Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Department of Radiodiagnosis  
KGMU, Lucknow

6771

# Tomo-Mammography/Tomosynthesis Guided Breast Biopsy unit

High Volume tertiary care Centre

The system should have following features:

- 1 X-ray Generator
  - a) X-ray generator should deliver high frequency constant output with minimum rating of 5KW with 100 mA or more at 35 kV.
  - b) kV range should be 22 to 45 kV or higher in 1kV increment.
  - c) mAs range should be 4 to 500 mAs or higher.
  - d) Automatic exposure control with manual override facility.
  - e) Exposure lock to prevent accidental double exposure.
- 2 X-ray tube
  - a) Heat storage capacity should be 150 KHU or more.
  - b) Dual focal spots of size 0.3 (large) and 0.1 mm (small).
  - c) There should be two or more nos of Filtration
- 3 Gantry
  - a) Fully motorized vertical movement and rotational movement
  - b) SID of 65 cm or more.
  - c) Removable patient visor/face shield.
  - d) Fully automated compression mode.
  - e) Single touch positioning of the gantry should be possible for smooth operation (MLO to CC or CC to MLO)
- 4 Digital Flat Panel Detector
  - a) Solid state Direct conversion type, size 24 cm x 29 cm ( $\pm 1$  cm).
  - b) Pixel size of 100 micron or less with same resolution in both 2D and 3D images
  - c) Specify image matrix (in pixel) and image size (in MB)
- 5 Digital breast Tomosynthesis
  - a) Fully integrated USFDA or European CE approved Tomosynthesis Mammography system to be supplied as the standard component.
  - b) It should be possible to perform 3D exam in both CC and MLO views.
  - c) It should be possible to obtain both standard views (2D view) and (3D view) without repositioning of the patient or any change in the attachments.
  - d) Specify time taken for tomosynthesis acquisition.

*Dr. Swati Kumar*

Professor Junior Grade

Department of Radiodiagnosis

KGMU, Lucknow

*P.K. Das*  
Prof. P.K. Das

Professor & Head

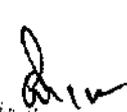
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Dr. RMLIMS, Lucknow

# Tomo-Mammography/Tomosynthesis Guided Breast Biopsy unit

High Volume tertiary care Centre

- e) It should be possible to generate synthesized mammographic view from Tomo data.
  - f) Mammography skin markers for marking palpable lumps, area of concern, skin moles and scars from previous surgeries. (20 each)
- 6 Acquisition workstation
- a) Diagnostic Grade Monitor of resolution of 3 megapixel or more
  - b) Facility for patient information, work list, scheduled workflow, mammography and
  - c) Tomo image review, print, storage, query and retrieve
  - d) Storage capacity of 5000 cases or more
  - e) There should be height adjustment of working table to facilitate users.
- 7 REPORTING WORKSTATIONS: (2 nos.):
- a) The Image processing as well as reviewing software for both 2D and 3D should be USFDA/CE/BIS approved
  - b) The Image processing as well as reviewing software for contrast enhanced mammography should be USFDA/CE/BIS certified
  - c) 2 Nos. of Medical grade Monitors of minimum 12 Megapixel resolution, capable of at least 1000cd/m<sup>2</sup> brightness, with Out-of-the-box calibration to the DICOM grayscale display function for luminance.
  - d) There should be automated built-in QA and calibration
  - e) There should be a protective anti-reflective glass panel to prevent accidental damage to the screen.
  - f) Dedicated mammography workflow keypad should be provided.
  - g) Customizable workflow, image layout and image orientation
  - h) It should be ready for multimodality (ultrasound, CT, MRJ) viewing
  - i) DICOM storage, query, retrieve, print in ready to use configuration
  - j) Storage capacity of minimum 20,000 images.
- 8 Image documentation and transfer
- a) It should be possible to transfer images to USB drive in DICOM and PC format from Acquisition workstation and Reporting workstation.
  - b) The workstation is to be integrated with DICOM compliant network of the institute
  - c) Mammography and tomosynthesis images should be vendor neutral so that viewing at any other workstation and storage in institute PACS server is possible. If these image formats are proprietary, appropriate licenses should be provided to convert them for general viewing.

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

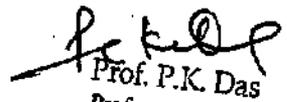
  
Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

# Tomo-Mammography/Tomosynthesis Guided Breast Biopsy unit

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- d) DICOM modality worklist (DMWL) and modality pre-procedure setup (MPPS) should be enabled.
- 9 Contrast enhanced mammography
- The system should be capable of dual energy contrast enhanced mammography in 2D acquisition mode. The software and hardware for contrast enhanced mammography should be clinically validated on patients. Proof of validation and any further technical advancement to be submitted
  - Facility for contract biopsy should be provided. System should allow radiologists to perform biopsy targeting on captured contrast enhanced images.
  - Dual head pressure injector compatible with mammography system - 01 no (Specify the make of the injector)
  - Injector syringes (100) with IV-line connectors to be provided. Unit price of consumables to be quoted separately for additional requirement in future
- 10 Digital Stereotactic breast biopsy facility
- Upright biopsy unit, which should allow biopsy in both CC and ML orientation of the gantry. The biopsy unit should be less than 7 kg in weight.
  - Facility for stereotactic biopsy should be provided
  - Tomo-Biopsy facility should be provided. (with all hardware and at least 10 consumable sets)
  - It should be ready to use with standard hookwire needles, 14G core biopsy guns and vacuum assisted biopsy probes. Needle holders, biopsy guides and any other hardware or software required for this purpose should be included with the unit.
- 11 Compression paddles
- Two standard compression paddles of width 15 cm more and 24 cm more
  - Spot and Magnification paddle and small breast paddles should be supplied
  - Stereotactic biopsy paddle with open window, Mag platform
  - Wire localization paddle with open window and alpha-numeric markers
  - Original (OEM) wall mounted hanger for compact docking of above mentioned
  - paddles
  - Cross hair localization kit.
- 12 Standard accessories

  
 Dr. Sukriti Kumar  
 Professor Junior Grade  
 Department of Radiodiagnosis  
 KGMU, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RML Hospital

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# Tomo-Mammography/Tomosynthesis Guided Breast Biopsy unit

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- a) Wireless localization markers should be provided for marking small, non-palpable lesions preoperatively. Magseed/Saviscout/localizer or equivalent (50 IN NO) with appropriate compatible reader probe. Unit Price of consumables for markers to be quoted separately for additional requirement in future.
- b) ACR approved phantom to be supplied along with the system and the supplier shall provide regular calibration and QA during the warranty and CMC period.
- c) Specimen localizing grid trays (60 nos.) for transporting surgical breast specimens for imaging without losing specimen orientation (ACCuGrid/KliniTray or equivalent)
- d) Mammography skin marker for palpable mass, area of concern and scars (30 each)
- e) Stereotactic core biopsy image and transport containers (30 in No) CoreTainer or equivalent.
- f) Hookwire needle localization wire protectors to stabilize the hookwire during transport from radiology suite to operating theatre
- g) Latest BI-RADS Atlas (6th Edition) in hardcopy as well as soft copy.
- h) Latest training phantoms for demonstration stereotactic biopsy and ultrasound guided biopsy (one each)
- i) Multi Modality viewer for viewing CT, MR,US, CR etc. images.
- j) Radiation shield with 0.5 mm lead equivalent around acquisition workstation
- k) The system should be regularly maintained in the latest version of computing software; including software platform updates/upgrades released for the respective system that can prepare it for future enhancements shall be free of cost during warranty and CMC period.
- l) UPS for 30 minutes back-up for entire system.
- m) Two tray online film camera with dpi 500 or more for printing of mammography films. Required networking of the same shall be done by the vendor.
- n) System should have FDA approved AI solution which utilizes AI analytics to uniquely reconstruct 3D Data based on stack imaging to reduce reading time, reducing data storage space and network traffic (Stack Imaging or equivalent). The AI software should be based on space and network traffic (Stack Imaging or equivalent). The AI software should be based on space and network traffic (Stack Imaging or equivalent). The AI software should be based on space and network traffic (Stack Imaging or equivalent).
- o) Machine learning and deep learning and should be able to categorize and prioritize case reading, depending on the findings. Please specify details of features. All AI solutions should be FDA approved
- p) Furniture and other accessories: Five Chairs, one Almira, one stool, two cupboard, two table with storage. Good quality ultralight Zero lead aprons with integrated thyroid shields (5 Nos) and stand. Ultrasonic pest repellents Four units to be provided and installed Regular servicing for pest / termite control to be undertaken.
- q) Fire detection system to be provided in the area using photoelectric smoke detector and heat detectors on the ceiling and will be connected to the main panel of the center as per the requirement of IS/BIS/national/international code. Minimum 4kg of portable ABC type fire extinguishers to be provided for firefighting (5 Nos.).
- r) Name boards for all rooms. Changing rooms should have change lockers and dressing table. Any other furniture item as per requirement. All furniture items should be of standard make. LED X-ray Film viewer with adjustable brightness; capable of holding 3 films of 14"x17" size, in all rooms as per requirement. Cabling of Network (LAN) connectivity for camera

Dr.  Ankriti Kumar  
Professor Junior Grade

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Department of Radiodiagnosis  
KGIMU, Lucknow

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# Tomo-Mammography/Tomosynthesis Guided Breast Biopsy unit

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- system, console system, workstation and computers etc. White Boards, Pin Boards and Wall clock etc. in all rooms as per requirements.
- s) Whitewash every 2 years and day-to-day routine maintenance including problems arising from seepage, etc.
  - t) Sound proofing of the room
- 13 Other features
- a) The vendor should assist and facilitate site approval, registration, licensing and Certification of the facility by AERB.
  - b) Vendors should have at least Five installation sites in India of the quoted system (with the quoted detector make/model configuration): performance certificate needs to be submitted along with the supporting documents.
  - c) Onsite Training- The application specialist of the company should stay at the site at-least for 5 days at the time of installation to train all faculty members and technicians in machine operations. This will be followed by similar two visits of 5 days each in the initial 6 months or whenever required. The visits should be scheduled in consultation with the department of Radio-diagnosis.
  - d) The system should have the following safety mechanisms: over voltage protection, short circuit protection and phase sequence corrector (for 3 phase equipment)
- 14 After sales, Warranty and CMC
- a) The comprehensive onsite warranty of five years of entire system shall commence from the date of issue of installation certificate by the institute. The warranty will include main unit with all parts including x-ray tube and detector, all accessories and optional items supplied with the unit, all turkey items, including batteries etc. One free software upgrade during warranty and unlimited software updates should be provided.
  - b) Regular maintenance and QA checks as per AERB norms will also be part of warranty and CMC.
  - c) After sales service: a factory trained service engineer should be available and Service call must be attended within 24 hours.
  - d) If the unit is being quoted by Indian agency which is not a direct subsidiary of the principals; an undertaking from the principals must be provided that in case of discontinuation or change of the agency, merger, acquisition or any corporate rearrangement, the principal will arrange for onsite maintenance of the unit and abide by all terms and conditions of the tender.
- 15 Turnkey Installation:
- a) The unit will be installed on Site-modification basis. The vendor should inspect the site before quoting and ensure that the unit and all accessories can be installed in the available space without any functional compromise. Civil modifications (Civil, electrical, fire safety and AC work) to be done as per the requirement in Machine & Reporting Room. Optimal Radiation

  
Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

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# Tomo-Mammography/Tomosynthesis Guided Breast Biopsy unit

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safety requirements must be taken into consideration. Airconditioning for the Mammography Room should be provided. Adequate furniture and fixtures of reputed brands should be provided. It should also include approved quality floor tiles and full height wall tiles. Power supply by the institute will be terminated at desired one point within the Mammography site. All electrical provisions including equipment mains panel, UPS cabling and DB, earthing etc. will be vendor's responsibility. All Site-modification work must comply with hospital norms.

## 16 Instructions to vendors

- a) All information asked must be provided clearly in compliance sheet under same headings. Haphazardly given information will not be considered.
- b) Original Product Datasheet of main unit and all accessories, including third party items to be provided as a part of the technical bid. Photocopy or computer-generated data sheets or emails shall not be accepted.
- c) Any technical clarification required which is not mentioned in the product data sheet should be clarified by the principals or manufacturer.
- d) On-site training of the staff by application expert should be provided for the period of not less than 2 weeks, as per the convenience of the department.
- e) "The equipment should have USA FDA or European CE certified with four digit notified Body number or BIS approved and certificate to be submitted. OR. Should meet IEC 60601-1, IEC60601-1-2 and IEC 60601-2-37 standards and valid test report to be submitted from NABL accredited lab for the quoted model or lab in the country of origin"

## 17 Optional accessories

- a) Vacuum assisted breast biopsy system which should be compatible with stereotactic, ultrasound biopsy systems. It should be pneumatically driven with single incision and single insertion device for multiple tissue sampling. System should offer continuous saline lavage to reduce risk of hematoma formation. (BREVERA or Bard-encore or equivalent). It should be configured ready to use with stereotactic as well as handheld ultrasound guidance Complete consumable sets for stereotactic, ultrasound and MR compatible biopsy guns (20nos each, total 60 numbers) and compatible biopsy site marker clips (20nos each, total 60 numbers) should also be supplied. Unit Price of consumables for vacuum assisted biopsy to be quoted separately for additional requirement in future (Optional).
- b) Specimen Radiography facility should be provided in the procedure room without any additional x-ray shielding. Image resolution of 80 micron or less with spatial resolution of 70 lp/mm or more. Active image area should be 16x16 cm or more.

  
Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM

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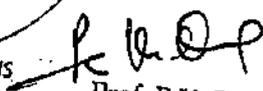
# Tomo-Mammography/Tomosynthesis Guided Breast Biopsy unit

High Volume tertiary care Centre with advanced research and superspecialist department

The system should have following features:

- 1 X-ray Generator
  - a) X-ray generator should deliver high frequency constant output with minimum rating of 5KW with 100 mA or more at 35 kV.
  - b) kV range should be 22 to 45 kV or higher in 1kV increment.
  - c) mAs range should be 4 to 500 mAs or higher.
  - d) Automatic exposure control with manual override facility.
  - e) Exposure lock to prevent accidental double exposure.
- 2 X-ray tube
  - a) Heat storage capacity should be 150 KHU or more.
  - b) Dual focal spots of size 0.3 (large) and 0.1 mm (small).
  - c) There should be two or more nos of Filtration
- 3 Gantry
  - a) Fully motorized vertical movement and rotational movement
  - b) SID of 65 cm or more.
  - c) Removable patient visor/face shield.
  - d) Fully automated compression mode.
  - e) Single touch positioning of the gantry should be possible for smooth operation (MLO to CC or CC to MLO)
- 4 Digital Flat Panel Detector
  - a) Solid state Direct conversion type, size 24 cm x29 cm ( $\pm 1$  cm).
  - b) Pixel size of 100 micron or less with same resolution in both 2D and 3D images
  - c) Specify image matrix (in pixel) and image size (in MB)
- 5 Digital breast Tomosynthesis
  - a) Fully integrated USFDA or European CE approved Tomosynthesis Mammography system to be supplied as the standard component.
  - b) It should be possible to perform 3D exam in both CC and MLO views.
  - c) It should be possible to obtain both standard views (2D view) and (3D view) without repositioning of the patient or any change in the attachments.

Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radio Diagnosis  
KGMU, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

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## Tomo-Mammography/Tomosynthesis Guided Breast Biopsy unit

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- d) Specify time taken for tomosynthesis acquisition.
  - e) It should be possible to generate synthesized mammographic view from Tomo data.
  - f) Mammography skin markers for marking palpable lumps, area of concern, skin moles and scars from previous surgeries. (20 each)
6. Acquisition workstation
- a) Diagnostic Grade Monitor of resolution of 3 megapixel or more
  - b) Facility for patient information, work list, scheduled workflow, mammography and
  - c) Tomo image review, print, storage, query and retrieve
  - d) Storage capacity of 5000 cases or more
  - e) There should be height adjustment of working table to facilitate users.
7. REPORTING WORKSTATIONS: (2 nos.):
- a) The Image processing as well as reviewing software for both 2D and 3D should be USFDA/CE/BIS approved
  - b) The Image processing as well as reviewing software for contrast enhanced mammography should be USFDA/CE/BIS certified
  - c) 2 Nos. of Medical grade Monitors of minimum 12 Megapixel resolution, capable of at least 1000cd/m<sup>2</sup> brightness, with Out-of-the-box calibration to the DICOM grayscale display function for luminance.
  - d) There should be automated built-in QA and calibration
  - e) There should be a protective anti-reflective glass panel to prevent accidental damage to the screen.
  - f) Dedicated mammography workflow keypad should be provided.
  - g) Customizable workflow, image layout and image orientation
  - h) It should be ready for multimodality (ultrasound, CT, MRI) viewing
  - i) DICOM storage, query, retrieve, print in ready to use configuration
  - j) Storage capacity of minimum 20,000 images.
8. Image documentation and transfer
- a) It should be possible to transfer images to USB drive in DICOM and PC format from Acquisition workstation and Reporting workstation.
  - b) The workstation is to be integrated with DICOM compliant network of the institute
  - c) Mammography and tomosynthesis images should be vendor neutral so that viewing at any other workstation and storage in institute PACS server is possible. If these image formats are proprietary, appropriate licenses should be provided to convert them for general viewing.

*Dr. Sukriti Kumar*  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

*P.K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

# Tomo-Mammography/Tomosynthesis Guided Breast Biopsy unit

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- d) DICOM modality worklist (DMWL) and modality pre-procedure setup (MPPS) should be enabled.
- 9 Contrast enhanced mammography
- a) The system should be capable of dual energy contrast enhanced mammography in 2D acquisition mode. The software and hardware for contrast enhanced mammography should be clinically validated on patients. Proof of validation and any further technical advancement to be submitted
- b) Facility for contract biopsy should be provided. System should allow radiologists to perform biopsy targeting on captured contrast enhanced images.
- c) Dual head pressure injector compatible with mammography system - 01 no (Specify the make of the injector)
- d) Injector syringes (100) with IV line connectors to be provided. Unit price of consumables to be quoted separately for additional requirement in future
- 10 Digital Stereotactic breast biopsy facility
- a) Upright biopsy unit, which should allow biopsy in both CC and ML orientation of the gantry. The biopsy unit should be less than 7 kg in weight.
- b) Facility for stereotactic biopsy should be provided
- c) Tomo-Biopsy facility should be provided. (with all hardware and at least 10 consumable sets)
- d) It should be ready to use with standard hookwire needles, 14G core biopsy guns and vacuum assisted biopsy probes. Needle holders, biopsy guides and any other hardware or software required for this purpose should be included with the unit.
- 11 Compression paddles
- a) Two standard compression paddles of width 15 cm more and 24 cm more
- b) Spot and Magnification paddle and small breast paddles should be supplied
- c) Stereotactic biopsy paddle with open window, Mag platform
- d) Wire localization paddle with open window and alpha-numeric markers
- e) Original (OEM) wall mounted hanger for compact docking of above mentioned
- f) paddles
- g) Cross hair localization kit.
- 12 Standard accessories
- a) Vacuum assisted breast biopsy system which should be compatible with stereotactic, ultrasound biopsy systems. It should be pneumatically driven with single incision and single insertion

Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

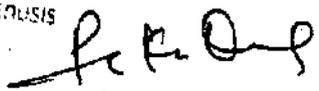
Dr. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

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- device for multiple tissue sampling. System should offer continuous saline lavage to reduce risk of hematoma formation. (BREVERA or Bard-encore or equivalent). It should be configured ready to use with stereotactic as well as handheld ultrasound guidance Complete consumable sets for stereotactic, ultrasound and MR compatible biopsy guns (20nos each, total 60 numbers) and compatible biopsy site marker clips (20nos each, total 60 numbers) should also be supplied. Unit Price of consumables for vacuum assisted biopsy to be quoted separately for additional requirement in future.
- b) Wireless localization markers should be provided for marking small, non palpable lesions preoperatively. Magseed/Saviscout/localizer or equivalent (50 IN NO) with appropriate compatible reader probe. Unit Price of consumables for markers to be quoted separately for additional requirement in future.
  - c) ACR approved phantom to be supplied along with the system and the supplier shall provide regular calibration and QA during the warranty and CMC period.
  - d) Specimen localizing grid trays (60 nos.) for transporting surgical breast specimens for imaging without losing specimen orientation (ACCuGrid/KliniTray or equivalent)
  - e) Mammography skin marker for palpable mass, area of concern and scars (30 each)
  - f) Stereotactic core biopsy image and transport containers (30 in No) CoreTainer or equivalent
  - g) Hookwire needle localization wire protectors to stabilize the hookwire during transport from radiology suite to operating theatre
  - h) Latest BI-RADS Atlas (6th Edition) in hardcopy as well as soft copy
  - i) Latest training phantoms for demonstration stereotactic biopsy and ultrasound guided biopsy (one each)
  - j) Multi Modality viewer for viewing CT, MR,US, CR etc. images.
  - k) Radiation shield with 0.5 mm lead equivalent around acquisition workstation
  - l) The system should be regularly maintained in the latest version of computing software; including software platform updates/upgrades released for the respective system that can prepare it for future enhancements shall be free of cost during warranty and CMC period.
  - m) UPS for 30 minutes back-up for entire system.
  - n) Specimen Radiography facility should be provided in the procedure room without any additional x-ray shielding. Image resolution of 80 micron or less with spatial resolution of 70 lp/mm or more. Active image area should be 16x16 cm or more.
  - o) Two tray online film camera with dpi 500 or more for printing of mammography films. Required networking of the same shall be done by the vendor.
  - p) System should have FDA approved AI solution which utilizes AI analytics to uniquely reconstruct 3D Data based on stack imaging to reduce reading time, reducing data storage space and network traffic (Stack Imaging or equivalent). The AI software should be based on machine learning and deep learning and should be able to categorize and prioritize case reading, depending on the findings. Please specify details of features. All AI solutions should be FDA approved

Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

# Tomo-Mammography/Tomosynthesis Guided Breast Biopsy unit

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- r) Furniture and other accessories: Five Chairs, one Almirah, one stool, two cupboard, two table with storage. Good quality ultralight Zero lead aprons with integrated thyroid shields (5 Nos) and stand. Ultrasonic pest repellents Four units to be provided and installed Regular servicing for pest / termite control to be undertaken.
- s) Fire detection system to be provided in the area using photoelectric smoke detector and heat detectors on the ceiling and will be connected to the main panel of the center as per the requirement of IS/BIS/national/international code. Minimum 4kg of portable ABC type fire extinguishers to be provided for firefighting (5 Nos.).
- t) Name boards for all rooms. Changing rooms should have change lockers and dressing table. Any other furniture item as per requirement. All furniture items should be of standard make. LED X-ray Film viewer with adjustable brightness; capable of holding 3 films of 14"x17" size, in all rooms as per requirement. Cabling of Network (LAN) connectivity for camera system, console system, workstation and computers etc. White Boards, Pin Boards and Wall clock etc. in all rooms as per requirements.
- u) Sound proofing of the room

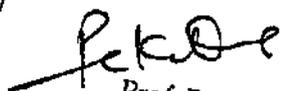
## 13 Other features

- a) The vendor should assist and facilitate site approval, registration, licensing and Certification of the facility by AERB.
- b) Vendors should have at least Five installation sites in India of the quoted system (with the quoted detector make/model configuration): performance certificate needs to be submitted along with the supporting documents.
- c) Onsite Training- The application specialist of the company should stay at the site at-least for 5 days at the time of installation to train all faculty members and technicians in machine operations. This will be followed by similar two visits of 5 days each in the initial 6 months or whenever required. The visits should be scheduled in consultation with the department of Radio-diagnosis.
- d) The system should have the following safety mechanisms: over voltage protection, short circuit protection and phase sequence corrector (for 3 phase equipment)

## 14 After sales, Warranty and CMC

- a) The comprehensive onsite warranty of five years of entire system shall commence from the date of issue of installation certificate by the institute. The warranty will include main unit with all parts including x-ray tube and detector, all accessories and optional items supplied with the unit, all turkey items, including batteries etc. One free software upgrade during warranty and unlimited software updates should be provided.
- b) Regular maintenance and QA checks as per AERB norms will also be part of warranty and CMC.

Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

# **Tomo-Mammography/Tomosynthesis Guided Breast Biopsy unit**

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- c) After sales service: a factory trained service engineer should be available and Service call must be attended within 24 hours.
- d) If the unit is being quoted by Indian agency which is not a direct subsidiary of the principals; an undertaking from the principals must be provided that in case of discontinuation or change of the agency, merger, acquisition or any corporate rearrangement, the principal will arrange for onsite maintenance of the unit and abide by all terms and conditions of the tender.

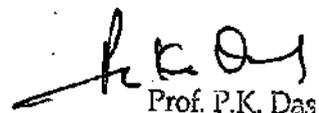
## 15 Turnkey Installation:

- a) The unit will be installed on Site-modification basis. The vendor should inspect the site before quoting and ensure that the unit and all accessories can be installed in the available space without any functional compromise. Civil modifications (Civil, electrical, fire safety and AC work) to be done as per the requirement in Machine & Reporting Room. Optimal Radiation safety requirements must be taken into consideration. Airconditioning for the Mammography Room should be provided. Adequate furniture and fixtures of reputed brands should be provided. It should also include approved quality floor tiles and full height wall tiles. Power supply by the institute will be terminated at desired one point within the Mammography site. All electrical provisions including equipment mains panel, UPS cabling and DB, earthing etc. will be vendor's responsibility. All Site-modification work must comply with hospital norms.

## 16 Instructions to vendors

- a) All information asked must be provided clearly in compliance sheet under same headings. Haphazardly given information will not be considered.
- b) Original Product Datasheet of main unit and all accessories, including third party items to be provided as a part of the technical bid. Photocopy or computer-generated data sheets or emails shall not be accepted.
- c) Any technical clarification required which is not mentioned in the product data sheet should be clarified by the principals or manufacturer.
- d) On-site training of the staff by application expert should be provided for the period of not less than 2 weeks, as per the convenience of the department.
- e) "The equipment should have USA FDA or European CE certified with four digit notified Body number or BIS approved and certificate to be submitted. OR. Should meet IEC 60601-1, IEC60601-1-2 and IEC 60601-2-37 standards and valid test report to be submitted from NABL accredited lab for the quoted model or lab in the country of origin"

  
Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. RMLIMS, Lucknow

# 300 mA Fix X-Ray machine with Horizontal Table & Wall Mount Chest Stand

## X-Ray Generator:

- Microcontroller-based High-frequency (40 KHz or more) X-Ray generator.
- Output power should be 15KW or more.
- KV Range 40 to 125KV
- mA range 300 mA or more
- mAs range – Up to 250mAs
- Over-Load Indication should be available.
- Digital Display of KV, mA, mAs.

## X-Ray Tube:

- The tube should be a Rotating Anode.
- Dual Focal Spot: Small- 1 mm<sup>2</sup> or smaller & Large 2 mm<sup>2</sup>.
- One pair of High-tension cables (at least 6 meters)
- LED Collimator with full-field illumination with auto shut facility after 30 secs.
- Collimator brightness should be  $\geq 100$  lux.
- The anode heat capacity should be 140KHU or more.

## Control Panel:

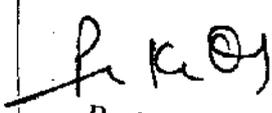
- User configurable, 216 no. of Anatomical programs or more
- Detailed Error Indication in case of malfunction in X-ray equipment.
- Display of KV mAs & Sec.
- mA Control
- KVp increment & Decrement in step of 1KVp only.
- Overload indication.
- The Control Panel should be compact and pedestal mount.

## Radiography Table:

- Radiolucent Table-Top, Phenolic laminated sheet of 0.5 Al equivalent
- Moving Bucky Cassette Tray, Compatible with Cassette sizes of – 8" x 10", 10" X 12", 12" X 15" & 14" X 17" with auto centering & Cassette lock
- Length: 1925mm
- Width : 710mm
- Height: 785mm
- X-Ray Area: 1925 x 695mm
- Grid: 8:1, 60 LPI

  
Dr. Sukriti Kumar

Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow



# 300 mA Fix X-Ray machine with Horizontal Table & Wall Mount Chest Stand

## Tube Stand

- a) Floor to Ceiling Stand with 360° Axis Rotation
- b) Column Movement can be arrested by Foot Lock
- c) Column Height: 2400mm or more
- d) Column Horizontal Travel: 3300 mm or more
- e) Tube Horizontal Travel: 800mm or more
- f) Tube Vertical Travel: 1700mm or more
- g) Tube Rotation: 360°

**Wall Mount Chest Stand:** Suitable wall Mount Chest Stand

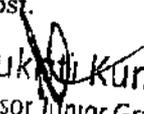
**Power Supply Requirement:** 440VAC ± 10%, Three phase, 50/60 Hz.

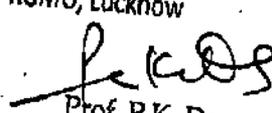
## Standard Accessories:

The machine should be supplied with complete dark room accessories (a) Safe light (b) Master Tank 9ltrs complete with two tank (c) Half film blocker (d) Lead Markers (e) Zero Lead aprons -02 Qty (0.25mm equivalent) (f) X ray clips and hangers 12 each (g) Developer & Fixer one pack each (h) 12x15 film box of 50 sheets (i) two LED View Box (3 plate) (with full installation on turn key basis for machine and dark room accessories) (j) Appropriate (AERB approved) movable Lead barrier with viewing lead glass window (12 inch by 12 inch across or larger) for placing between the operator and x-ray assembly during exposure.

## Installation:

- a) Installation to be done on turnkey basis and has to be quoted after visiting the site and available infrastructure.
- b) Appropriate structural shielding shall be provided for walls, doors, ceiling and floor of the room housing the X-ray equipment so that radiation exposures received by workers and the members of the public are kept to the minimum and shall not exceed their respective dose limits (as per the AERB).
- c) The vendor/OEM shall provide a written undertaking that OEM shall be responsible for the decommissioning as per the AERB norms of the machine at the end of its life, free of cost. In the event that the OEM/vendor merges with another company or shuts down during the warranty or CMC period, the successor company shall assume full responsibility for the decommissioning at no additional cost.
- d) Footstep for patients: 2
- e) Examination Stool - 1

  
Dr. Sukh Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## 300 mA Fix X-Ray machine with Horizontal Table & Wall Mount Chest Stand

- f) Name Boards for all rooms and AERB based radiation related signage
- g) Fire extinguishers 2 no's 5 Kg ABC type to be provided.
- h) Split/Windows air conditioners may be used according to room requirement & suitability. Humidity control should be effective to eliminate moisture condensation on equipment surface.
- i) It is the vendor's responsibility to ensure that all cables are properly sealed to prevent any rodent related damage, and that the outdoor unit of the AC is adequately covered.
- j) 4 plate led film viewer.
- k) A set of one table and 4 movable chairs (Godrej/ zeeken/ equivalent) for operator/ workstation

### Others:

- a) The offer should be accompanied by the original product data sheet and brochure of the product tube and generator.
- b) The AERB type approval certificates must be submitted at the time of bid submission.
- c) The X-ray unit should be approved by CE with 4 digits notified body number / USFDA/ BIS & CDSCO.
- d) QA test should be done free of cost during the warranty period, QA test shall be done in the CMC period, and the rates shall be included in the CMC offered.
- e) The manufacturing firm should be ISO 13485: 2016 & ISO 9001:2015 approved.
- f) The firm should have a service center in the state to ensure prompt after-sales service.
- g) The manufacturer should have a toll-free call center for logging service requests.

*[Signature]*  
Dept. of Radiodiagnosis  
RMLIMS, Lucknow

*[Signature]*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

*[Signature]*  
Dr. Sukanti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

# Digital Radiography System (300 ma) with Single Detector

## X-Ray Generator:

- Microcontroller-based High-frequency X-Ray generator.
- The frequency should be 40 KHz or more.
- Output power should be 15KW or more.
- KV Range – 40 to 125KV
- mA range – 300 mA or more
- mAs range – Up to 250mAs
- Over-Load Indication should be available.
- Digital Display of KV, mA, mAs.

## X-Ray Tube:

- The tube should be a Rotating Anode.
- Focal Spot: Small- 1 mm<sup>2</sup> & Large 2 mm<sup>2</sup>.
- One pair of High-tension cables (at least 6 meters)
- LED Collimator with full-field illumination with auto shut facility after 30 secs.
- Collimator brightness should be  $\geq 100$  lux.
- The anode heat capacity should be 140KHU or more.

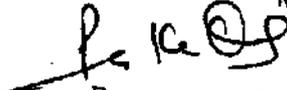
## Control Panel

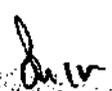
- User configurable, 216 no. of Anatomical programs or more
- Detailed Error Indication in case of malfunction in X-ray equipment.
- Display of KV mAs & Sec.
- mA Control
- KVp increment & Decrement in step of 1KVp only.
- Overload indication.
- The Control Panel should be compact and pedestal mount.

## Detector.

- The flat panel detector should be with CsI scintillator layer with latest technology.
- Should be Fixed 17x17 inches detector.
- Should have a spatial resolution of 3.6 lines pair/millimeter or better.

  
Dr. Mukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Digital Radiography System (300 ma) with Single Detector

- The resolution should not be less than 3072 x 3072 pixels.
- Should have a minimum image depth of 16 bit.
- The System should be able to enhance MTF by software.
- The Pixel pitch should be 140 $\mu$  or lesser.
- Real-time & Post Processing features including Stitching Software
- Detectors and Console Software should be mandatorily from the same manufacturer of FPD.

### Tube & Detector Stand with Housing & Removable Grid

Ceiling Free Tube & detector Stand with manual movement, bot stand

- Vertical Movement of Detector: 1310mm  $\pm$ 10mm
- Detector Rotation:  $\pm$ 90 $^{\circ}$   $\pm$ 10 $^{\circ}$
- Electromagnetic Locks
- Grid Holder
- Removable Grid: 103LPI; 10:1 Grid

### Mobile Radiography Table:

- Table-Top Length: 1950 mm
  - Table-Top Width: 660 mm
  - Table-top height: 760 mm
  - Four Wheels (Front Wheels with lock; Rear Wheels without Lock)
- Table-Top Material: Bakelite.

### Acquisition Workstation:

Both Manual and Automatic Facility for data input from RIS/HIS via DICOM.

The Print Layout Editor allows to: - Select different printing formats (DICOM, Paper) - Print up to 25 images on one film, according to printer capability (multiple image printing) - Print zoomed images - Print patient and examination data within the acquired images (customizable at configuration)

The workstation should be supplied with the following configuration: CPU - Intel i5/ i7 latest generation available at the time of delivery, RAM - at least 8GB, HDD - 1TB

Dr. Sukriti Kumar

Professor Junior Grade

Department of Radiodiagnosis  
KGMU, Lucknow

Prof. P.K. Das

Professor & Head

Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Digital Radiography System (300 ma) with Single Detector

(SSD), OS Windows 10 32/64 bit. Display Monitor: 24" size; 1900 x 1080 Pixels, LED  
UPS for CPU (backup time at least: 15 min)

### Additional Workstation

Images, documentation etc. image Preview, Image processing functions like rotate, mirroring, zoom, move, windowing, filter and printing etc. should be available. This workstation should be supplied with the following configuration: CPU – Intel i5/ i7 latest generation available at the time of delivery, RAM – at least 8GB, HDD – 1TB (SSD), OS Windows 10 32/64-bit, Display Monitor: 24" size; 1900 x 1080 Pixels, LED. UPS for CPU (backup time at least: 15 min)

### DICOM Printer

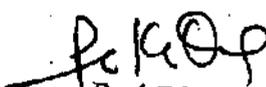
- a) Minimum Two Tray Laser Printer 500 dpi, 50-micron laser spot spacing.
- b) Integrated DICOM interface supports printing from DICOM modalities.
- c) Supports the following film sizes: 14X17 in. (35 x 43 cm), 11 x 14 in. (28 x 35 cm), 10 x 12 in. (25 x 30 cm), 8 x 10 in. (20 x 25 cm)

**Power Supply Requirements:** 440VAC $\pm$  10%, Three phase, 50/60 Hz.

### Installation:

- a) Installation to be done on turnkey basis and must quoted after visiting the site and available infrastructure.
- b) Appropriate structural shielding/ lead equivalent shall be provided for walls, doors, ceiling and floor of the room housing the X-ray equipment so that radiation exposures received by workers and the members of the public are kept to the minimum and shall not exceed their respective dose limits (as per the AERB). The lead glass size between the machine room and the console should be at least 3 feet x 4 feet.
- c) The vendor/OEM shall provide a written undertaking that OEM shall be responsible for the decommissioning as per the AERB norms of the machine at the end of its life, free of cost. In the event that the OEM/vendor merges with another company or shuts down during the warranty or CMC period, the successor company Shall assume full responsibility for the decommissioning at no additional cost.
- d) Footstep for patients: 2
- e) Examination Stool - 1

Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Digital Radiography System (300 ma) with Single Detector

- f) Name Boards for all rooms and AERB based radiation related signage
- g) Fire extinguishers 2 no's 5 Kg ABC type to be provided.
- h) Split/Windows air conditioners may be used according to room requirement & suitability. Humidity control should be effective to eliminate moisture condensation on equipment surface.
- i) It is the vendor's responsibility to ensure that all cables are properly sealed to prevent any rodent related damage, and that the outdoor unit of the AC is adequately covered.
- j) 4 plate led film viewer.
- k) A set of one table and 4 movable chairs (Godrej/ zeeken/ equivalent) for operator/ workstation
- l) Two zero lead apron of 0.5mm lead equivalent and two thyroid shield.

### Others:

- a) The offer should be accompanied by the original product data sheet and brochure of the product tube, generator and detector.
- b) The AERB type approval certificates must be submitted at the time of bid submission.
- c) The X-ray unit should be approved by CE with 4 digits notified body number / USFDA/ BIS & CDSCO.
- d) QA test should be done free of cost during the warranty period, QA test shall be done in the CMC period, and the rates shall be included in the CMC offered.
- e) The manufacturing firm should be ISO 13485: 2016 & ISO 9001:2015 approved.
- f) The firm should have a service center in the state to ensure prompt after-sales service.
- g) The manufacturer should have a toll-free call center for logging service requests.

  
Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow



Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Prof. P.K. Das  
Department of Radiodiagnosis  
KGMU, Lucknow

## 500 mA Fix X-Ray machine with Horizontal Table & Wall Mount Chest Stand

### X-Ray Generator:

- a) Microcontroller-based High-frequency X-Ray generator.
- b) The frequency should be 40KHz or more.
- c) Output power should be 40KW or more.
- d) KV Range – 40 to 125KVp.
- e) mA range – 50 to 500 mA.
- f) 500mA @ 80KV, 400mA @ 100KV.
- g) Small Focus mA Station: 50, 100, 160.
- h) Large Focus mA Station: 200, 250, 320, 400, 500
- i) mAs range – 1 to 800 mAs.
- j) Over-Load Indication should be available.
- k) Digital Display of KV, mA, mAs/Sec.

### X-Ray tube:

- a) The tube should be Rotating Anode.
- b) Focal Spot: Small 1.0mm x 1.0mm (or smaller) & Large 2mm x 2mm.
- c) One pair of High-tension cables (at least 6-meters)
- d) LED Collimator with full field illumination with the auto shut facility after 30 secs.
- e) Collimator brightness should be  $\geq 100$  lux.
- f) The anode heat capacity should be 140KHU or more.

### III. Radiography Table:

- a) Radiolucent Table-Top, Phenolic laminated sheet of 0.5 Al equivalent
- b) Moving Bucky Cassette Tray, Compatible with Cassette sizes of – 8" x 10", 10" X 12", & 14"X17" with auto centring & Cassette lock
- c) Length : 1920mm or more
- d) Width : 710mm or more
- e) Height : 785mm or more
- f) X-Ray Area : 1925 x 694mm
- g) Grid : 8:1, 60 LPI

### Tube Stand

- a) Floor to Ceiling Stand with 360° Axis Rotation
- b) Column Movement can be arrested by Foot Lock
- c) Column Height: 2400mm or more
- d) Column Horizontal Travel: 3300 mm or more
- e) Tube Horizontal Travel: 800mm or more
- f) Tube Vertical Travel: 1700mm or more
- g) Tube Rotation: 360°

  
Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

# 500 mA Fix X-Ray machine with Horizontal Table & Wall Mount Chest Stand

Wall Mount Chest Stand: Suitable wall Mount Chest Stand

## Control Panel:

- a) User configurable, 216 no. of Anatomical programs or more
- b) Detailed Error Indication in case of malfunction in X-ray equipment
- c) Display of KV, mA, mAs & Sec
- d) KVp increment & Decrement in step of 1KVp only.
- e) Overload indication.
- f) The Control Panel should be compact.

Power Supply Requirements: 440VAC,  $\pm 10\%$  Three phase, 50Hz.

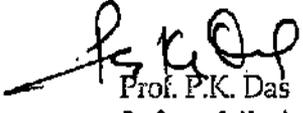
## Standard Accessories:

The machine should be supplied with complete dark room accessories (a) Safe light (b) Master Tank 9ltrs complete with two tank (c) Half film blocker (d) Lead Markers (e) zero Lead aprons -02 Qty (.25mm equivalent) (f) X ray clips and hangers 12 each (g) Developer & Fixer one pack each (h) 12x15 film box of 50 sheets (i) two LED View Box (3 plate) (with full installation on turn key basis for machine and dark room accessories) (j) Appropriate (AERB approved) movable Lead barrier with viewing lead glass window (12 inch by 12 inch across or larger) for placing between the operator and x-ray assembly during exposure.

## Installation:

- a) Installation to be done on turnkey basis and has to be quoted after visiting the site and available infrastructure.
- b) Appropriate structural shielding shall be provided for walls, doors, ceiling and floor of the room housing the X-ray equipment so that radiation exposures received by workers and the members of the public are kept to the minimum and shall not exceed their respective dose limits (as per the AERB).
- c) The vendor/OEM shall provide a written undertaking that OEM shall be responsible for the decommissioning as per the AERB norms of the machine at the end of its life, free of cost. In the event that the OEM/vendor merges with another company or shuts down during the warranty or CMC period, the successor company shall assume full responsibility for the decommissioning at no additional cost.
- d) Footstep for patients: 2
- e) Examination Stool - 1
- f) Name Boards for all rooms and AERB based radiation related signage
- g) Fire extinguishers 2 no's 5 Kg ABC type to be provided.

  
Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## 500 mA Fix X-Ray machine with Horizontal Table & Wall Mount Chest Stand

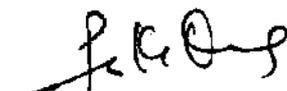
- b) Split/Windows air conditioners may be used according to room requirement & suitability. Humidity control should be effective to eliminate moisture condensation on equipment surface.
- i) It is the vendor's responsibility to ensure that all cables are properly sealed to prevent any rodent related damage, and that the outdoor unit of the AC is adequately covered.
- j) 4 plate led film viewer.
- k) A set of one table and 4 movable chair (Godrej/ zeeken/ equivalent) for operator/ workstation

### Others:

- a) The offer should be accompanied by the original product data sheet and brochure of the product tube and generator.
- b) The AERB type approval certificates must be submitted at the time of bid submission.
- c) The X-ray unit should be approved by CE with 4 digits notified body number / USFDA/ BIS & CDSCO.
- d) QA test should be done free of cost during the warranty period, QA test shall be done in the CMC period, and the rates shall be included in the CMC offered.
- e) The manufacturing firm should be ISO 13485: 2016 & ISO 9001:2015 approved.
- f) The firm should have a service center in the state to ensure prompt after-sales service.
- g) The manufacturer should have a toll-free call center for logging service requests.

  
Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

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## Specification for Digital Radiography System (500 ma) with Two Detectors(j)

40KW, 500 mA Digital Radiography System with Floating Top Table, Vertical Bucky Stand, and 2 Nos. 17x17" Latest generation CsI Scintillation Flat Panel Detector

### X-Ray Generator:

- a) Microcontroller controlled High-frequency X-Ray generator 40 KHz or more.
- b) Output power should be 40 KW or more.
- c) KV Range - 40 to 125KVp
- d) mA range - Up to 500 mA.
- e) mAs range - up to 800 mAs
- f) Overload Indication should be available.
- g) Digital Display of KV, mA, mAs/Sec

### X-Ray Tube:

- a) The tube should be Rotating Anode.
- b) Focal Spot: Small 1mm<sup>2</sup> & Large 2mm<sup>2</sup>.
- c) One pair of High-tension cables.
- d) LED Collimator with full-field illumination with auto shut facility after 30 secs.
- e) Collimator brightness should be  $\geq 100$  lux.
- f) The anode heat capacity of the tube should be 140KHU or more.

### Radiography Table:

- a) The table should be horizontal floating type.
- b) Bucky table with floating table-top with immense flexibility and ease in positioning.
- c) Tabletop positioning with the release of electromagnetic brakes controlled with a foot-operated lever.
- d) Table Height - 710 cm or less.
- e) Tabletop - 220 x 70 cm or wider.
- f) Tabletop should be made up of low radiation absorption ( $< 1.0$  mmAl equivalent), water-proof material, and stain-free.

*M*  
Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

*P.K.D.*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Specification for Digital Radiography System (500 ma) with Two Detectors<sup>(i)</sup>

- g) Longitudinal Travel: 76 cm or more
- h) Transverse Travel: 23 cm or more
- i) Electromagnetic locking of the table movement

### Bucky for Table:

- a) Grid 10 :1, 103 LPI,
- b) 60 cm travel; movement arrested by electromagnetic brakes.
- c) Should be capable of accommodating 17 x17" Flat Panel Detector.

### Floor Mounted Tube Stand

- a) Tube Stand Movement should be arrested by electromagnetic locks.
- b) Column longitudinal travel: 2315mm  $\pm$  10mm
- c) Tube transverse travel: 370mm  $\pm$  10mm.
- d) Tube vertical travel: 1310mm  $\pm$  10mm.
- e) Tube rotation:  $\pm$  90°.
- f) Column axis rotation:  $\pm$  360°

### Vertical Bucky Stand:

- a) Ceiling-free counterbalanced column.
- b) Height should be 200cm  $\pm$  5cm.
- c) UP/ Down travel of bucky: 1310mm  $\pm$  10mm
- d) Magnetic Locks:
- e) Grid 10: 1, 103 LPI.
- f) Should be capable of accommodating 17 x17" Flat Panel Detector.

### Control Panel

- a) User configurable, 216 no. of Anatomical programs or more
- b) Detailed Error Indication in case of malfunction in X-ray equipment.
- c) Display of KV, mA, mAs & Sec
- d) Density Control
- e) KVp increment & Decrement in step of 1KVp only.
- f) Overload indication.
- g) The Control Panel should be compact & Pedestal mount.

  
 Dr. Sukriti Kumar  
 Professor Junior Grade  
 Department of Radiodiagnosis  
 KGMU, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

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## Specification for Digital Radiography System (500 ma) with Two Detectors(i)

### Fixed Digital Flat Panel Detector for table and vertical bucky(2Nos 17 x 17 inch)

- a) The flat panel detector should be with CsI scintillator layer with latest technology.
- b) The Detector should have a spatial resolution of 3.6 lines pair/millimeter or better.
- c) The Pixel pitch should be 140 $\mu$  or lesser.
- d) The resolution should not be less than 3072 x 3072 pixels.
- e) Should have a minimum image depth of 16 bits.
- f) The System should have an algorithm to enhance MTF by software.
- g) The Software should have image-stitching facility manual & Auto image stitching.
- h) Detectors and console Software should be mandatorily from the same manufacturer of FPD.

### Acquisition Workstation:

Both Manual and Automatic Facility for data input from RIS/HIS via DICOM.

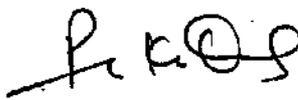
The Print Layout Editor allows to: - Select different printing formats (DICOM, Paper) - Print up to 25 images on one film, according to printer capability (multiple image printing) - Print zoomed images - Print patient and examination data within the acquired images (customizable at configuration)

The workstation should be supplied with the following configuration: CPU – Intel i5/ i7 latest generation available at the time of delivery, RAM – at least 8GB, HDD – 1TB (SSD), OS Windows 10 32/64 bit. Display Monitor: 24" size; 1900 x 1080 Pixels, LED

### Additional Workstation

Images, documentation etc. image Preview, Image processing functions like rotate, mirroring, zoom, move, windowing, filter and printing etc. should be available. This workstation should be supplied with the following configuration: CPU – Intel i5/ i7 latest generation available at the time of delivery, RAM – at least 8GB, HDD – 1TB (SSD), OS Windows 10 32/64-bit, Display Monitor: 24" size; 1900 x 1080 Pixels, LED.

  
Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow.

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLJMS, Lucknow

## Specification for Digital Radiography System (500 ma) with Two Detectors(i)

### DICOM Printer

- a) Minimum Two Tray Laser Printer 500 dpi, 50-micron laser spot spacing.
- b) Integrated DICOM interface supports printing from DICOM modalities.
- c) Supports the following film sizes: 14X17 in. (35 x 43 cm), 11 x 14 in. (28 x 35 cm), 10 x 12 in. (25 x 30 cm), 8 x 10 in. (20 x 25 cm)

### Power Supply Requirements: 440VAC $\pm$ 10%, Three phase, 50/60 Hz.

- a) Online UPS with 45 minutes back up for both workstation and for the imager
- b) Suitable Voltage Stabilizer for the DR system should be supplied

### Installation:

- c) Installation to be done on turnkey basis and has to quoted after visiting the site and available infrastructure.
- d) Appropriate structural shielding/ lead equivalent shall be provided for walls, doors, ceiling and floor of the room housing the X-ray equipment so that radiation exposures received by workers and the members of the public are kept to the minimum and shall not exceed their respective dose limits (as per the AERB). The lead glass size between the machine room and the console should be at least 3 feet x 4 feet.
- e) The vendor/OEM shall provide a written undertaking that OEM shall be responsible for the decommissioning as per the AERB norms of the machine at the end of its life, free of cost. In the event that the OEM/vendor merges with another company or shuts down during the warranty or CMC period, the successor company shall assume full responsibility for the decommissioning at no additional cost.
- f) Footstep for patients: 2
- g) Examination Stool - 1
- h) Name Boards for all rooms and AERB based radiation related signage
- i) Fire extinguishers 2 no's 5 Kg ABC type to be provided.
- j) Split/Windows air conditioners may be used according to room requirement & suitability. Humidity control should be effective to eliminate moisture condensation on equipment surface.
- k) It is the vendor's responsibility to ensure that all cables are properly sealed to prevent

Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

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## Specification for Digital Radiography System (500 ma) with Two Detectors(i)

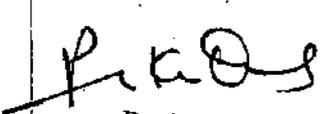
- any rodent related damage, and that the outdoor unit of the AC is adequately covered.
- l) 4 plate led film viewer.
  - m) A set of one table and 4 movable chairs (Godrej/ zeeken/ equivalent) for operator/ workstation
  - n) Two zero lead apron of 0.5mm lead equivalent and two thyroid shield.
  - o) Operating manual

### Others:

- a) The offer should be accompanied by the original product data sheet and brochure of the product tube and generator and detector.
- b) The AERB type approval certificates must be submitted at the time of bid submission.
- c) The X-ray unit should be approved by CE with 4 digits notified body number / USFDA/ BIS & CDSCO.
- d) QA test should be done free of cost during the warranty period, QA test shall be done in the CMC period, and the rates shall be included in the CMC offered.
- e) The manufacturing firm should be ISO 13485: 2016 & ISO 9001:2015 approved.
- f) The firm should have a service center in the state to ensure prompt after-sales service.
- g) The manufacturer should have a toll-free call center for logging service requests.

  
Dr. Sukriti Kumar

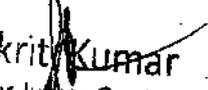
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

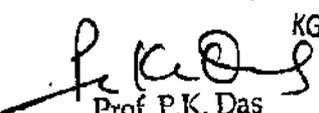
  
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Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

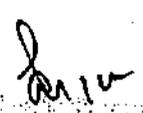
  
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## Specification for Digital Radiography System (500 ma) with Two Detectors (ii)

1. **Digital Radiography System with Two Detectors**
  - a) The system should have two detectors; Wire cum wireless detector in the patient table and one in the Bucky wall stand with one integrated control console capable of controlling generator, X-ray tube, imaging system and table from the central console.
  - b) X-ray Generator/ detector/ tube should be from reputed manufacturer and
  - c) Original data sheet should be provided with the bid document for transformer, detector, X-ray Tube
2. **Generator:**
  - a) High frequency generator with output power 52 KW or more.
  - b) mAs 0.5/ 1 - 500 or more
  - c) KV should range 40-150 KV.
  - d) Output should be 500 mA or more
  - e) It should have automatic exposure control (AEC) device.
  - f) Tube overload protection should be available
3. **X-RAY Tube & Collimator:** The X- Ray tube should be high speed rotating anode, compatible with the
  - a) Generator with rotation speed of at least 8000 RPM. It must have dual focus facility (small focus of 0.6mm square and large focus of 1.0 to 1.2- mm square).
  - b) Tube with anode heat storage capacity 300 KHU or more.
  - c) Motorized collimator with light field indicator & total filtration of at least 1 mm Al.
  - d) Equipment should have auto tracking and automated vertical stitching functionality
4. **Ceiling mounted Column Support:**
  - a) Ceiling Suspended tube support with counterbalancing should be provided.
  - b) Movements should be easy and simple with Electromagnet locking.
  - c) It should allow three -dimensional movements of the tube head covering a huge area.

  
 Dr. Sukrit Kumar  
 Professor Junior Grade  
 Department of Radiodiagnosis  
 KGMU, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Dr. RMLIMS, Lucknow

## Specification for Digital Radiography System (500 ma) with Two Detectors (ii)

- d) An LCD/ LED display screen should be available on the X-ray tube for control and display of multiple functions like tube angle, SID.
- e) Stand should have Longitudinal, Transverse and Vertical movement.
- f) Movements of stand should be Counterbalance /motorized.
- g) Longitudinal movement: more than 3200 mm
- h) Transverse movement: more than 2000 mm
- i) Vertical up/down movement: more than 1500 mm
- j) Tube Head Rotation should be possible along its
- k) Horizontal axes (at least  $\pm 180^\circ$  degrees with detent position 0 degree and  $\pm 90$ -degree lock at any position) and
- l) Vertical axes- please specify.
- m) Electromagnetic locks should be available for safety. Auto Stop function should be possible to meet the Chest bucky distance.

### 5. Vertical Bucky Stand with integrated detector.

- a) Vertical Bucky stand should be Stationary The unit should be provided with vertical Bucky with motorized tilt facility.
- b) Bucky should have Removable /retractable movable grid with minimum grid ratio of 10: 1 or better. Chest X-Ray or Pediatric X-Ray should be possible by removing the grid.
- c) The vertical Bucky stand should accommodate an integrated solid-state detector of size at least 34cm x 43 cm
- d) Tilt of Bucky - Specify (motorized).
- e) Vertical Bucky should be height adjustable (at least 150 cm).
- f) All the movements of the vertical Bucky stand, and Bucky should be electromagnetically lockable.

### 6. Digital Radiography Detector (Two) one on Chest Stand/Vertical Bucky Stand (Fixed) and one Separate wireless detachable detector compatible with table Bucky:

- a) Flat Panel solid state detector type fixed in the bucky wall stand.
- b) Size: 43cm x 43cm
- c) Scintillator: Cesium Iodide (CsI)

  
 Dr. Sanjit Kumar  
 Professor Junior Grade  
 Department of Radiodiagnosis  
 KGMU, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

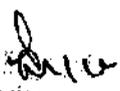
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## Specification for Digital Radiography System (500 ma) with Two Detectors (ii)

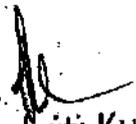
- d) Image Matrix 2.8k x 2.8k or better
- e) Pixel Size: 150 $\mu$ m or smaller
- f) DQE (Detector Quantum Efficiency) - Please specify and should match in two detectors
- g) The Panel should be integrated to the same workstation for both
- h) Detector should have software which corrects the effect of scatter radiation on acquired image by processing, without the need of physical grid Detectors.

### 7. Horizontal Table

- a) Fixed Horizontal 4-way floating tabletop of size at least 200 cm x 80 cm
- b) Transverse and longitudinal movements of the tabletop should be locked by electromagnetic locks.
- c) Movements of table should be motorized:
- d) Transverse movements:  $\pm 12.5$  cm or more
- e) Longitudinal movements:  $\pm 45$  cm or more
- f) Height adjustment facility should be available with at least 30cm ( $\pm 10\%$ ) lift. Lowest height should be lesser than 55cm ( $\pm 10\%$ ).
- g) Maximum weight carrying capacity for the table during up/ down movement should be equal to or more than 300 kg.
- h) The table Bucky should have Removable /retractable Moving grid of 10:1 grid ratio or better.

  
Prof. P.K. Das  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

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## Specification for Digital Radiography System (500 ma) with Two Detectors (ii)

### 8. Console and Image Processing Workstation:

- a) The digital workstation should be based on the latest high-speed microprocessor (launched not before two years of supply) with at least 8 GB RAM, S-ATA drive and capacity for storage of at least 4000 images. CD /DVD reader /writer /USB facility for exporting images should be available.
- b) It should have facility for acquiring images from the detector system.
- c) It should have Digital image processing technology and software.
- d) It should be provided with 19" or larger size anti-glare color display with matrix of at least 1024 x 1024.
- e) Following should be possible
  - Digital Display of kV & mAs
  - Selection of KV & mAs
  - Anatomical Programming Radiography: At least 200 pre-programmed organ programs should be available.
  - Exposure Control.
- f) Preview image should be available in less than 9 seconds.
- g) Processed image should appear in less than 10 seconds.
- h) Automatic image optimization
- i) Image harmonization algorithms for uniform images should be available.
- j) Pre-set image processing tools for different anatomy should be available.
- k) Post processing functions must be available like Image cropping, rotation, vertical and horizontal reversal, windowing for contrast / brightness, black/white image inversion, Image annotation, arrow marking, R/L marking, image comments. Quantification with angle distance measurements should be available.
- l) User-defined printing formats must be available.
- m) The workstation should be DICOM compatible and have networking capability for delivering images electronically to HIS/RIS/PACS, remote workstations, image archives and printers

### 9. DICOM Printer

- a) Minimum Three Tray Laser Printer 500 dpi, 50-micron laser spot spacing.

  
Dr. Sukr Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Specification for Digital Radiography System (500 ma) with Two Detectors (ii)

- b) Integrated DICOM interface supports printing from DICOM modalities.
  - c) Supports the following film sizes: 14X17 in. (35 x 43 cm), 11 x 14 in. (28 x 35 cm), 10 x 12 in. (25 x 30 cm), 8 x 10 in. (20 x 25 cm)
- 10. Power Supply Requirements: 440VAC $\pm$  10%, Three phase, 50/60 Hz.**
- a) Online UPS with 45 minutes back up for both workstation and for the imager
  - b) Suitable Voltage Stabilizer for the DR system should be supplied
- 11. Installation:**
- a) Installation to be done on turnkey basis and has to be quoted after visiting the site and available infrastructure.
  - b) Appropriate structural shielding/ lead equivalent shall be provided for walls, doors, ceiling and floor of the room housing the X-ray equipment so that radiation exposures received by workers and the members of the public are kept to the minimum and shall not exceed their respective dose limits (as per the AERB). The lead glass size between the machine room and the console should be at least 3 feet x 4 feet.
  - c) The vendor/OEM shall provide a written undertaking that OEM shall be responsible for the decommissioning as per the AERB norms of the machine at the end of its life, free of cost. In the event that the OEM/vendor merges with another company or shuts down during the warranty or CMC period, the successor company shall assume full responsibility for the decommissioning at no additional cost.
  - d) Footstep for patients: 2
  - e) Examination Stool - 1
  - f) Name Boards for all rooms and AERB based radiation related signage
  - g) Fire extinguishers 2 no's 5 Kg ABC type to be provided.
  - h) Split/Windows air conditioners may be used according to room requirement & suitability. Humidity control should be effective to eliminate moisture condensation on equipment surface.
  - i) It is the vendor's responsibility to ensure that all cables are properly sealed to prevent any rodent related damage, and that the outdoor unit of the AC is adequately covered.
  - j) Four plate led film viewer.
  - k) A set of one table and 4 movable chairs (Godrej/ zeeken/ equivalent) for operator/

Dr. Sumati Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow



## Specification for Digital Radiography System (500 ma) with Two Detectors (w)

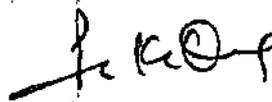
workstation

- l) Two zero lead apron of 0.5mm lead equivalent and two thyroid shield.
- m) Standard accessories if available should be provided including:
- n) Abdominal compression belt, handgrip (2units) for the table & vertical bucky stand and lateral cassette holder, shall be supplied along with main equipment.
- o) Operating manual should be provided with the machine.

### 12. Others:

- a) The offer should be accompanied by the original product data sheet and brochure of the product tube and generator and detector.
- b) The AERB type approval certificates must be submitted at the time of bid submission.
- c) The X-ray unit should be approved by CE with 4 digits notified body number / USFDA/ BIS & CDSCO.
- d) QA test should be done free of cost during the warranty period, QA test shall be done in the CMC period, and the rates shall be included in the CMC offered.
- e) The manufacturing firm should be ISO 13485: 2016 & ISO 9001:2015 approved.
- f) The firm should have a service center in the state to ensure prompt after-sales service.
- g) The manufacturer should have a toll-free call center for logging service requests.

  
Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

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1 Gantry

- a) Aperture  $\geq 70$  cm
- b) Scan fields  $\geq 50$  cm
- c) Gantry Tilt: minimum physical / digital tilt of 20 degrees on either side
- d) Integrated display panel: Integrated display panel Gantry front OR Tablet based on mobile workflow showing patient information, an ECG, breath-holding and scan guidance\

2 X-RAY Generator

- a) Output capacity (actual and not effective) 72 kW or more
- b) mA range: 20-600mA or more
- c) kV : 80-135 KVP

3 Tube Assembly

- a) Tube Voltage: 80-135KV or more
- b) Tube current range: 600mA or more
- c) Anode heat storage capacity: 7 MHU or Direct Cooling Technology
- d) Anode heat dissipation rate: 1 MHU per minute
- e) Focal spot: Please specify.

4 Patient Table

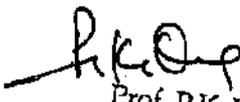
- a) Maximum load capacity  $\geq 200$  kg
- b) Scannable range 1700 mm
- c) Longitudinal table speed  $2100$  mm per sec

5 Scanning Modes

5.1 Spiral scanning

- a) Spiral exposure At least 60 sec or more
- b) Scan time for full 360degree rotation in all modes 0.35 sec

  
Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. RMLIMS, Lucknow

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5.2 Axial Scanning

- a) Slice Thickness (Axial mode) 0.625 — 5 mm variable
- b) Dynamic Multi scan: It must be possible to do dynamic multi scan for any body part

6 Data Acquisition Configuration System Latest Detector

- a) Number of acquired / generated slices per rotation in all modes: Minimum 128 slices in all modes with minimum 64 physical rows of detector
- b) Whole brain perfusion: The system should do whole brain CT perfusion with coverage of not less than 8 cm.
- c) Dynamic CTA: Enabling 4D CT DSA, time resolved perfusion with a minimum range of 4 cm.

7 PATIENT COMMUNICATION

- a) Integrated patient intercom: There should be integrated patient intercom
- b) Automatic patient instruction: A standard set of commands for patient communication before, during, and after scanning should be available in the English and Hindi language

8 Patient Registration:

- a) Pre-registration: It should be possible to do pre-registration of patient at any time prior to scans
- b) Emergency registration: Special emergency registration should be possible

9 Operator Console with Table

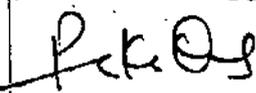
- a) CPU Processor: Minimum quad core processor, 900 GE hard disc, 32 GB RAM. The best available option to be quoted by the vendor
- b) Single/ dual 24" high resolution lcd monitors with 1024x1024 or more
- c) Software: Should perform the functions like scanning image reconstruction, film documentation, MPR, CT angiography, MIP, 30 VRT. 3D SSD. Fly through, readymade perfusion for stroke imaging.

  
Dr. Sukriti Kumar

Professor Junior Grade

Department of Radiodiagnosis

KGMU, Lucknow



Prof. P.K. Das

Professor & Head

Dept. of Anaesthesiology & CCM

Dr. RMLIMS, Lucknow

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- d) 4D Workflow: 4D workflow with direct generation of axial, sagittal, coronal or double-oblique images from standard protocols.
- e) CT Angiography and Automated bone removal: Protocols to do CT angiography of region and accurate presentation of subtracted CTA data sets
- f) Metal Artifact Reduction (MAR) should be available in CT main console or Workstation
- g) Monitor of 18" or more with Cart for carrying monitor and Fact switch for display of images during CT guided intervention.

10 **Image Post Processing**

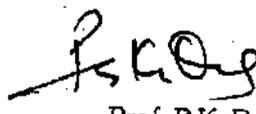
- a) Architecture: A Client Server Architecture base solution (IntelliSearch portal/ AW Server/Syngo Via etc.) Server Hardware details: Intel Gold CPU 8-core, 64 to 96 GB RAM, 3 TB storage with separate disks for system SW, Win Server 2019 edition (latest)/Linux & NVIDIA 5 to 8 GB GPU.
- b) Client hardware (2 units) specification for each client station.
- c) Monitors: One 19" or more display monitor per client, each monitor of 2 Megapixels or more, mouse, online continuous ups of at least 2kVA

Server S/w Basic capabilities (2 or more concurrent users for all applications)

- d) MPR: Real-time multi-planar reconstruction (MPR) of secondary views, with viewing perspectives in all planes including curved & orthogonal MPR.
- e) ROI evaluation: Parallel evaluation of multiple ROI in circle, irregular and polygonal forms.
- f) Statistical Evaluation: Image annotation and labelling, Angle measurement and Distance measurement
- g) 2D:2-D. including image zoom and pan, image manipulations, reversal of greyscale values
- h) 3D: MIP, Min IP, SSD, VRT and other advanced 3D applications and color-coding for different tissues

Advanced application as mentioned below (2 numbers of concurrent license)

  
Dr. S. K. Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

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- i) CT Angio: Automatic table and bone subtraction in CT angiography, Single click bone removal, manual vessel tracking, ability for a bone free visualization of the selective highlighting of high contrast structures. vessel tracking, single click Stenosis measurement and coronary vessel tracing.
  - j) CT Neuro perfusion: Software for advanced cerebral perfusion study with stroke protocol and summary maps of the perfused area.
  - k) Cardiac Function and Ca scoring: Left Ventricular Analysis (LVA), Left ventricular wall analysis and Automated left ventricular segmentation.
  - l) OEM/Vendor should provide AI-enable Motion correction in Coronary Angiograph
  - m) Integrated fusion: multi-modality fusion- fusion between PCT-CT, PET-UR, CT-UR, MRMR. Etc.
  - n) Neuro OSA For evaluating cranial arteries by single click bone subtraction
  - o) Stroke Analysis & Quantification Stroke Analysis & Quantification "Advanced application as mentioned (2 number of concurrent licensers)
  - p) Complete Liver Volumetry & Segmentation; Complete Liver volumetry & Segmentation "Advanced application as mentioned (2 number of concurrent license)"
- 11 Image Reconstruction:
- a) Recon speed: Minimum 35 images/sec
  - b) Recons Field of View: 5 to 50 cm continuous
  - c) Recon Matrix: 512 X 512
- 12 Dose Reduction Techniques
- a) Pre-patient collimation: There should be pre-patient collimation to reduce unnecessary dose to the patient Iterative
  - b) Latest Iterative Reconstruction Technique: reconstruction technology for all imaging protocols which reduces dose while simultaneously improving low contrast detectability & spatial resolution and reduces image noise.
  - c) Pediatric g infant protocol: Dedicated pediatric / infant protocol to be offered by the vendor.

Dr. Sauriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

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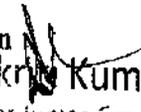
- 13 **DUAL HEAD PRESSURE INJECTOR:** Dual head pressure injector with Synchronization with CT Scanner (of any make), with dual flow with 50 nos of Syringes & 200 sets of tubing's. Unit price for disposable syringe and tubing set should be quoted separately and the same should be valid during warranty period.
- 14 **Dry Chemistry Camera:** Dry chemistry camera of DPI 500 or more of any reputed make e.g., Fujifilm, Carestream, Agfa, or Konika. With 3 tray facility - 17X14, 10X12 and others.
- 15 **UPS:** UPS With Maintenance free batteries capable of 30 minutes back-up to run the entire CT, Computers, Dry chemistry camera Workstations etc.
- 16 **Multi Parameter Monitor:** Multi Para monitor 10-inch monitor, ECG, SPO2, NIBP module of a reputed make for monitoring vital parameters.
- 17 **Miscellaneous:**
- a) **LEAD APRONS:** LIGHT WEIGHT lead Aprons (0.25mm lead equivalent) with hangers - 4 Nos.
  - b) **LEAD GLASS:** Lead Glass of 200 X 100 cm as per AERB Norms
  - c) **LEAD APRON STAND:** Lead apron stand — 1 No.
  - d) **THYROID SHIELD:** 3 nos
  - e) **Gonadal Shields — 3 nos**
  - f) **Standard Patient positioning accessory and restraining device:** All standard Accessories pertaining to patient comfort and desired study like patient restraint kit, table pad, cushions and pads
  - g) **Onsite Training:** In-house training should be provided for technical staff and radiologists from an application expert from the principal Manufacturer for a minimum period of 4 weeks in the beginning and 2 wks after 6 months of operation.
- 18 **Installation**
- a) **Installation to be done on turnkey basis.** The installation and commissioning of the new machine shall be free. The site can be seen by the vendor and room plan Lay out to be

**Dr. Akriti Kumar**  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

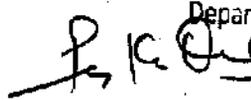
  
**Prof. P.K. Das**  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

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- submitted along with Bid. Flooring, wall furnishing, radiation shielding, limited civil and electrical work will be included.
- b) Appropriate structural shielding/ lead equivalent shall be provided for walls, doors, ceiling and floor of the room housing the equipment so that radiation exposures received by workers and the members of the public are kept to the minimum and shall not exceed their respective dose limits (as per the AERB). The lead glass size between the machine room and the console should be at least 200 x 100 cms.
  - c) The vendor/OEM shall provide a written undertaking that OEM shall be responsible for the decommissioning as per the AERB norms of the machine at the end of its life, free of cost. If the OEM/vendor merges with another company or shuts down during the warranty or CMC period, the successor company Shall assume full responsibility for the decommissioning at no additional cost.
  - d) Name Boards for all rooms and AERB based radiation related signage
  - e) Appropriate Fire extinguishers ABC type to be provided.
  - f) Split/Windows air conditioners may be used according to room requirement & suitability. Humidity control should be effective to eliminate moisture condensation on equipment surface.
  - g) It is the vendor's responsibility to ensure that all cables are properly sealed to prevent any rodent related damage, and that the outdoor unit of the AC is adequately covered.
  - h) Two executive type office chairs, two table for computer system, one trolley for consumables and emergency drugs from reputed make like Godrej etc.
  - i) Operating manual
- 19 Certification:
- a) Should have import/manufacturing license from Central licensing Authority or State licensing authority Of CDSCO for Medical Devices and copy of valid license should be submitted for the quoted model. In case the vendor has not yet obtained import/manufacturing license from CDSCO for the quoted model, proof of application

  
Dr. Sukruth Kumar  
Professor Junior Grade

Department of Radiodiagnosis  
IGMU, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

128 Slice CT scan

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- for CDSCO medical device license to be submitted in the bid document and valid CDSCO license to be produced at the time of supply /NOA for the quoted
- b) The system should be AERB type approved, and the copy of E-LORA Listing should be submitted along with bid. If the quoted model has not been yet installed in India, vendor should submit NOC from AERB.
  - c) Regular QA according to AERB norms will be the responsibility of the bidder during warranty and CMC period. Regular QA according to AERB norms will be the responsibility of bidder during warranty and CMC period.
  - d) The offered system should be BIS / European CE with 4 digits notified body no / USFDA certified.

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*P.K.D.*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

*[Signature]*  
Dr. S. Anjali Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

3T MRI system

	None of the components or accessories supplied with the product should be refurbished	
	<b>Magnet</b>	3Tesla (superconducting) Magnet with approximately 70 cm or more bore diameter.
	<b>a) Field Strength</b>	Helium only 3T (superconducting) Magnet along with facility for quick shutdown of the magnet in case of emergency.
	<b>b) Field stability over time</b>	Should have active shielding, external interference shielding with good field stability. Mention the RF frequency of operation and the field drift.
	<b>c) Homogeneity</b>	(i) Best homogeneity possible should be given. Specify homogeneity in VRMS at 10 cm, 20 cm, 30 cm and 40 cm DSV and at max. FOV achievable with the quoted scanner.
		(ii) Should be very good for Single voxel and CSI spectroscopy, Specify values
		(iii) Please specify the homogeneity at 40 cm FOV (guaranteed homogeneity).
	<b>d) Magnet Bore</b>	70 cm or more magnets bore diameter, after positioning of gradient, shim and RF coils.
	<b>e) Active Shielding / Fringe field</b>	Quote values for 5 Gauss and 1 Gauss line.
	<b>f) Ext. Shielding</b>	Ext. Interference shield (sufficient to house the Magnet, Anesthesia and Physiologic monitors should be provided)
	<b>g) Magnet Cooling system</b>	(i) The magnet should be having zero helium boil off rate
		(ii) Devices for helium level monitoring in the magnet should be supplied.
		(iii) Liquid helium should be supplied during warranty period and CMC.
		(iv) The vendor should include the Cold Head maintenance and replacement during warranty period and during AMC
	<b>(h) Shim System</b>	(i) High performance and highly stable shim system with global and localized manual and auto shimming for high homogeneity magnetic field required for imaging (MRI /fMRI), single voxel spectroscopy (MRS), and spectroscopic imaging (MRSI). 3D shimming for volume imaging and CSI.
		(ii) Auto shim (global and voxel shim) should take minimum time to shim the magnet with patient in position (specify the time).
		(iii) Specify number of shim coils including higher order.
2	<b>(a) Patient Table</b>	(i) Computer controlled subject table movement in vertical and horizontal direction.
		(ii) The vendor should supply fully motorized computer-controlled table, with movements in vertical and horizontal directions for the MRI patient table.
		(iii) Patient table should be able to take at least 200 Kg load.

*[Signature]*  
 Dr. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

*[Signature]*  
 Dr. Sukriti Kumar  
 Professor Junior Grade  
 Department of Radiodiagnosis  
 KGMU, Lucknow

*[Signature]*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

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## 3T MRI system

		(iv) Emergency manual traction of the subject from the magnet.
	<b>b) Patient monitoring</b>	(i) Patient monitoring devices for ECG, respiratory, pulse rate, B.P., oxygen saturation suitable for adult as well as pediatric patients. A comprehensive solution at patient side and at main console capable of gating the sequence protocols with respect to patient's heart (ECG) and respiratory rates.
	<b>c) Patient comfort features</b>	(i) Two-way Patient communication with headphone, microphone and necessary accessories.
		(ii) Patient audio-alarm
		(iii) Internal gantry lighting
		(iv) MR compatible Music system (complete) should be able to play inside the gantry
		(v) Closed circuit TV and CCD video camera for patient monitoring
		(vi) Provide other standard patient comfort devices, with quoted system (please specify)
		(vii) Artificial Sky light
<b>3</b>	<b>Gradient System</b>	<b>Gradient System</b>
	<b>a) General</b>	(i) Actively shielded gradient system in X, Y, Z planes.
		(ii) Minimum Gradient Strength should be 44 mT/m or more along each axis and a slew rate of 200 T/m/s in each axis. Gradient strength should be such that minimum amplitude of at least 44mT/m and minimum slew rate of 200T/m/s should be achieved Please specify rise time.
		iii) The system should have 32 independent RF receiver channels/ Channel independent technology in single scan and single FOV (which can be demonstrated).
		(iv) Specify the linearity of the gradients at full FOV.
		(v) 100% duty cycle for full FOV.
	<b>b) Resolution parameters</b>	(i) Specify the minimum and maximum FOV achievable for the quoted MR system (preferable to have 10 - 450 mm FOV).
		(ii) Specify min. Slice thickness in 2D and 3D modes at 128x128, 256x256, 512x512 and 1024x1024 matrices
		(iii) The system should be capable of performing single shot EPI (preferably in 64x64, 128x128, and 256 x 256 matrixes).
		(iv) Effective cooling system for gradient coil and power supply, for uninterrupted operation during summers also. The system should have efficient and adequate provision for eddy current compensation.
<b>4</b>	<b>a) RF Transmitter</b>	(i) A fully digital RF system capable of at least 30KW (as per FDA guidelines).
		(ii) Specify max. transmitter RF power available (at 50-ohm impedance)

Dr. S. Anjali Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

P.K. Das

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. SMLIMS, Lucknow

### 3T MRI system

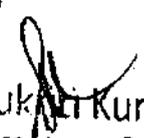
	<b>b) RF receiver</b>	(i) Optical/ Digital RF receiver system with/ high efficient RF receiver system / or its equivalent located on the magnet inside the shielded active room (ii) System should have <b>32 independent RF receiver channels / channel independent</b> technology (which can be demonstrated) (iii) Specify the RF receiver bandwidth for each channel. (iv) The system should have necessary hardware to support quadrature phased array and flex coils.
	<b>c) RF Transmit technology</b>	(i) RF transmit system (like Multi-transmit/ Multi Drive transmit system/ <b>True form</b> ) should be offered to improve B1 uniformity and signal homogeneity and to reduce patient induced in-homogeneities
	<b>d) SAR limits</b>	(i) SAR limits should be as per FDA guidelines for all protocols, including n Devices for helium level monitoring in the magnet should be supplied.
	<b>e) Coils ( total number =11)</b>	(i) <b>Head coil / Head Neck coil of at least 32 channels</b> for high resolution brain, EPI/ DTI applications, Compatible with fMRI projection device quoted with the system. (ii) Separate Head neck coil with at least 16 channels or more for routine brain/Neurovascular exams should also be quoted as standard. (iii) Spine array coil (32 Channel or more) (iv) Body array coil / Phased Array coil (30 Channel) (v) Dedicated Shoulder array coil (16 channel or more) (vi) Dedicated Knee imaging. Transmit/Receive coil (16 Channel or more) (vii) <b>Dedicated Breast Coil (7 Channel or more)</b> (viii) Separate coil for cardiac imaging / <b>Second body coil (at least 30 channel )</b> (ix) Multipurpose flex coils large (16 channel or more) for imaging of large shoulder, hip, brachial plexus etc. (x) Multipurpose flex coils small (4 channels or more) for imaging small regions such as elbow, wrist, TM-joint etc. (xi) <b>Dedicated Ankle Coil of 16 channels or more</b>
	<b>f) Coil Technology</b>	(i) Integrated coil technology, latest as available with the vendor to be quoted:
	<b>g) Table Technology</b>	(i) Bolus chasing with automatic/continuous moving table should be offered and should be available with fluoro triggered MR angiography for manual and fast switchover.
5	<b>Computer control system</b>	(i) The vendor should supply the latest computer system along with the MR system, to handle all the latest applications available on the MR platform. (ii) During the warranty period, any software updates that are Launched globally should be supplied and installed.

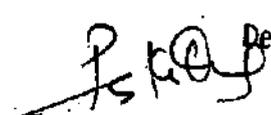
Dr. Sushil Kumar  
 Professor Junior Grade  
 Department of Radiodiagnosis  
 KGMU, Lucknow

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

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a) Main console	(i) State-of art computer system with sufficient RAM (32GB or more) and computational speed to match the single shot Echo Planar Imaging (EPI), interactive angiogram, multi-planar three dimensional (3D) reconstruction, surface rendering and dynamic imaging, vascular imaging / angiography, and adequate storage for images and other applications.
	(ii) Total hard disk memory capable of storing a minimum of 2,00,000 (two lakh) images
	(iii) Monitor 19" or more, Medical grade monitor with enhanced graphics accelerator.
	(iv) Necessary softwares on main console for MIP, MPR, 3D, filming and image post processing, MR spectroscopy post processing.
	(v) The main console should have pulse sequence software license that may be required to modify and run pulse sequences. If this is not possible, the vendor should provide the necessary hardware and software necessary for such application (like laptop with system interface solution).
b) Additional workstations	Two additional (concurrent) DICOM compatible workstations with 21 inch medical grade monitors (Client server based) for simultaneous working and networking with main console. Image storage should be at least 2.5 TB (more will be preferred) with 64 GB RAM
	i. Basic post processing software including MIP, MPR, Volume rendering, and 3D evaluation, filming, CD/ DVD recording on all stations
	ii. Two licenses for MR perfusion post processing, advanced diffusion and DTI enabling tractography, Image fusion capability for prostate/ brain/ others, processing of 2D/3D MRS CSI data with color metabolite mapping.
	iii. Two licenses for all required software such as each of the application – fMRI, advance cardiac evaluation (EF, Calculation, wall motion analysis, cardiac perfusion), CSF flow quantification, other advance processing softwares (liver segmentation, liver fat quantification, liver iron quantification, relaxometry, whole body fat quantification)
c) CD/DVD archival	(i) CD/DVD drive for writing of images, spectra along with the necessary software for reading the images on any ordinary computer. Data archival on additional hard drives should also be possible.
	(ii) Provision for archival of k space data and raw image data (unprocessed).
d) Networking	i. The vendor should provide Level 3 network Switch (with 32 nodes) or latest, to integrate the network.
	ii. Protocol Ethernet TCP/IP standards based image transfer with DICOM 3.0 over standard Ethernet IEEE 903 (DICOM send, receive and DICOM query modes).

  
 Dr. Sukanta Kumar  
 Professor Junior Grad  
 Department of Radiodiagnosis  
 KGMU, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

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3T MRI system

		iii. The vendor should provide the connectivity with existing PACS in the SGPGI. If feasible networking between MRI workstation should be done with existing CT workstations in the department.
		iv. The network speed and cables should match the latest industry standards (e.g. 10 BaseT/100BaseT/ 1 GB)
		v. System should be configured with different IP series, so as not to clash with different equipment already existing in different departments.
		vi. The vendor should provide necessary networking and configuration assistance with existing PACS, HIS, RIS.
	e) Film Documentation	DICOM interface to hook DICOM compatible, dockable, latest state of art Dry Laser Camera with more than 500 dpi, capable of storing/printing images of 1024 x 1024 (or higher, if available) matrix size in various matrix formats (including 16 format) without loss of digital resolution to be made available on any of the consoles and on the films (Agfa/Fuji/Kodak/ Carestream), with three online tray system.
6	a) Data Acquisition (Main console)	(i) The system should be capable of 2D and 3D acquisitions in conventional, fast & ultra fast spin echo and gradient echo modes so that real-time online images can be observed if needed. All the standard sequences that are available with the vendor at the time of quote/ delivery should be provided as per their manual.
		(ii) 2D multi slice imaging should be possible in all planes (axial, sagittal, coronal, oblique and double oblique]
		(iii) Up to 1024 x 1024 matrix acquisitions preferred for all applications. Wherever 2048 matrix available, please mention.
		(iv) Half Fourier or other techniques to reduce scan acquisition time while maintaining adequate SNR.
		(v) 3D volume, multiple contiguous slabs, multiple interleaved and multiple overlapping slabs
		(vi) Slice thickness in 2D and partition in 3D to be freely selectable.
		(vii) Dynamic acquisition (serial imaging) with capability to initiate scan sequences either from the magnet panel or from the console.
		(viii) Dynamic acquisition; number of repeat scans with delay time either identical time interval or selectable.
		(ix) Auto slice positioning from the localizer images.
		(x) Maximum off center positioning both anterior posterior and lateral direction and should be selectable.

Dr. Sukanti Kumar

Professor Junior Grade

Department of Radiodiagnosis

AGMU, Lucknow

  
Prof. P.K. Das

Professor & Head

Dept. of Anaesthesiology & CCM

Dr. RMLIMS, Lucknow

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	(xi) Gating: physiological signals like ECG, pulse, respiratory, External signal triggering (interface for triggering input pulse from external source). Suitable probes should be provided for adults as well as pediatric patients. The provision should be available at the console for FMRI etc.
	(xii) Simultaneous acquisition, processing and display of image data in 2D multi-slice mode.
	(xiii) Selection of voxels from oblique slices should be possible while doing spectroscopy.
	(xiv) Artifact reduction/imaging enhancement/image filtering/ image subtraction/addition/ multiplication/division techniques.
	(xv) Flow: 1st and 2nd order flow artifact compensation
	(xvi) Presentation slabs: a number of relocatable saturation bands to be placed either inside or outside the region of interest
	(xvii) Graphic prescription.
	(xviii) Fat saturation techniques: frequency selective RF pulses to suppress fat signals in the measured image FOV. ROI selective (regional) fat suppression should also be given.
	(xix) Magnetization transfer saturation: Off resonance RF pulses to suppress signals from stationary tissue in FOV.
	(xx) Phase contrast capability in 2D and 3D mode.
	(xxi) Image intensity correction
	(xxii) Breath hold acquisition
	(xxiii) EPI mode
	(xxiv) DTI with MDDW or equivalent with a minimum of 12 and selectable up to 128 direction encoding.
	(xxv) Data acquisition in all three standard planes (axial, sagittal, coronal) and oblique and double oblique planes or more oblique planes.
	(xxvi) Higher matrix acquisition capability in single shot EPI. Acquisition time, TR, TE and slice thickness should be clearly mentioned and supported by data sheet reference.
	(xxvii) The vendor should offer multi coil acquisition in order to Optimize throughput increase and increased effective FOV. Individual acquisition elements of every coil should be mentioned.
<b>b) Imaging Pulse sequences</b>	(i) All standard and special pulse sequences available at the time of quote/ delivery should be offered and quoted in the bid.
	(ii) The system should be capable of selecting TR and TEs as per requirement in majority of the pulse sequences.
	(iii) Spin echo (SE): multi-slice single echo, multi-slice multi-echo (8 echo or more), SE with symmetrical and asymmetrical echo intervals and fast spin echo. MT-SE

Dr. Sukh Kumar

Professor Junior Grade

Department of Radiodiagnosis

KG MU, Lucknow

Prof. P.K. Das

Professor & Head

Dept. of Anaesthesiology & CCM

Dr. RMLIMS, Lucknow

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		imaging sequence.
		(iv) Inversion recovery (IR): including short T1 modified IRSE, FLAIR, DIR (Double Inversion Recovery).
		(v) Gradient echo (GE): with transverse gradient/RF spoiling, and transverse gradient re phasing, e.g., GRASE orequivalent etc. 3D gradient echo with shortest TR and TE, free choice of flip angle selection, while maintaining SNR.
	Fast sequences	(i) Fast spin echo and GE sequences in 2D and 3D mode with T1, T2 and PD contrast capable, of acquiring maximum number of slices with a given TR a minimum TE, echo train should be at least 128 or more in fast spin echo mode
		(ii) Half Fourier acquisition capabilities should be available with/without diffusion gradients and in combination with /fast spin echo.
		(iii) Fast inversion recovery with spin echo
		(iv) Fast gradient spin echo IR multi-slice multi- echo mode with maximum ETL. Sequences should incorporate RF focusing to acquire ultra-fast gradient spin echo.
		(v) Fast gradient echo sequence should incorporate RF spoiling and other technique to acquire images in ultra-fast 2D and 3D modes.
		(vi) Fat and water suppressed imaging sequences.
		(vii) EPI optimized sequences (with and without fat suppression)
		(viii) For T1, T2, PD imaging, perfusion, regular diffusion values (at least 5b, 3 directions) EPI FLAIR. EPI-IR. EPI FLAIR diffusion tensor, EPI MT FLAIR, tensor diffusion (at least 16 b values, and 128 directions) and diffusion studies. Suitable artifact/ fat suppression techniques to be incorporated in the sequence to have optimum image quality.
		(ix) There should be capability of calculating ADC map (isotropic and anisotropy from the regular diffusion and tensor data).
		(x) Optimized sequences for special applications.
		(xi) Multi-band EPI: Simultaneous Multi Slice Accelerate advance applications for Neuro & Body.
	Optimized sequence packages and Misc. sequences	Mention all available packages
	c) Neuro	(i) All T1 (2D, 3D), T2 (2D, 3D), IR (2D, 3D), Dual IR (2D, 3D) sequences

Dr. Sukrit Kumar

Professor Junior Grade

Department of Radiodiagnosis

KGMU, Lucknow

Prof. P.K. Das

Professor & Head

Dept. of Anaesthesiology & CCM

Dr. RMLIMS, Lucknow

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	(ii) Sequence for internal ear imaging for visualization of fine structures like cranial nerves (appropriate sequences like CISS etc or equivalent. Mention the sequences provided.
	(iii) 3D sequences for internal auditory canal imaging
	(iv) Dynamic imaging of pituitary using appropriate sequence
	(v) Whole spine T1, T2, IR sequences
	(vi) Whole neuro examination with automatic planning, automatic coil selection with single localizer positioning, without changing the coils/ repositioning
	(vii) SMS ( Simultaneous Multi Slice Imaging) for neuro-imaging
	(viii) 2D / 3D ASL
	(ix) Susceptibility weighted imaging
	(x) MR ventriculography, cisternography, myelography.
	(xi) Flow quantification packages for CSF with dynamic CSF flow imaging, aqueduct and spinal canal.
	(xii) Sequences for fat suppression in challenging areas like neck-thorax junction; Specify the special technique used.
	(xiii) MR neurography sequences for peripheral nerves and plexuses
	(xiv) Synthetic MRI sequence or equivalent
	(xv) Head movement tracking / prospective motion correction or equivalent technique
d) Vascular imaging & Perfusion	(i) MR angiography: 2D/3D TOF, 2D/3D Phase contrast with and without gating) and magnetization transfer saturation, black blood angiography for cerebral, pulmonary, abdominal and peripheral vessels.
	(ii) For peripheral moving table angiography should be offered covering hip to limbs to be examined in one go with high resolution and high SNR.
	(iii) Bolus tracking software package.
	(iv) Sequences for breath hold angiography with contrast enhancement.
	(v) Sequences for time resolved angiography with contrast kinetics.
	(vi) ECG triggered non contrast angiography
	(vii) Contrast bolus tracking (including single shot whole body MRA, interactive and automatic tracking, etc.).
	(viii) Perfusion study in organ systems like kidney, brain, etc, with T1, T2 based perfusion with permeability maps, and quantitation of rCBF/ rCBV, MTT, etc, with colour maps.
	(ix) Vessel wall imaging, Plaque characterization
	(x) Angio (including DSA approach, capturing arterial, capillary and venous phases in a single acquisition with a single bolus).

Dr. Sukrit Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

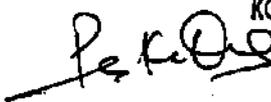
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

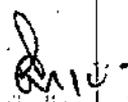
### 3T MRI system

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<b>e) Diffusion /D TI</b>	(i) Sequence package for diffusion including DTI and tractography study in organs like brain, spine, and other organs if available).
	(ii) There should be capability of calculating ADC map (isotropic and anisotropic from the regular diffusion and tensor data).
	(iii) MR diffusion tensor imaging package with tractography
	(iv) Application for high resolution for small FOV diffusion imaging
	(v) DWI – multi-shot EPI diffusion, Distortion free DWI
<b>f) Body Imagin g</b>	(i) Flow quantification in vessels and other areas where available
	(ii) Fly through facility with Flow analysis including display of various velocity values.
	(iii) Optimized breath hold sequences for abdominal studies including angiogram.
	(iv) MR Cholangiography and Pancreatography: Specialized sequences and processing to perform MRCP.
	(v) Pulmonary 2D/3D MRA sequence, including single breath hold sequence.
	(vi) Diffusion imaging for liver, kidney and small FOV Diffusion imaging for prostate etc.
	(vii) Single sequence to acquire four different contrast (in-phase, out of phase water only, fat only). The same technique should be used in other sequences, for dynamic portography/ T1 quantitative analyses.
	(viii) Parallel acquisition techniques including new sequences. Specify the technique used and the factor by which the acquisition time is reduced for similar acquisition with and without parallel imaging technique. Mention the sequences.
	(ix) Radial/Spiral pulse sequences for ultrafast imaging.
	(x) Suitable artifact/fat suppression techniques to be incorporated in all the sequences to have optimum image quality.
	(xi) Sequence for differentiation of fluid and cartilage in ortho applications (sequence like DESS or equivalent).
	(xii) Susceptibility artifact correction techniques to be incorporated in all the sequences to have optimum image quality.
	(xiii) Liver (including 3D T1 Fat sat for dynamic liver imaging, iron and fat quantification, MR spectroscopy)
	(xiv) Automatic respiratory tracking without attaching any device on patient
	(xv) Single click landmarking
<b>g) Prostate Imaging</b>	(i) Multi-parametric imaging of prostate ( please quote the package)

**Dr. Sukh Kumar**  
 Professor Junior Grade  
 Department of Radiodiagnosis  
 KGMU, Lucknow

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow



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h) Whole Body imaging	Whole body imaging using DWI with background suppression, inversion recovery sequence/ STIR, whole body MR angiography; without need for patient repositioning. Automatic fusion and composing software. Whole body fat quantification
i) m-Dixon	(i) Provide sequences like m-Dixon for all applicable sequences, m Dixon - HD or equivalent.
j) Relaxometry	T1 mapping and T2 mapping with necessary post-processing s/w.
k) Motion correction	(i) Sequence for in-line motion correction for uncooperative patients/ children (with software and acquisition sequences like BLADE /PROPELLAR / Multivane or equivalent). (ii) Sequence with ultra- short TE (iii) Sequence for nullifying CSF pulsation artifacts (iv) Sequence enabling prospective motion correction in quick time and in real time during fMRI.
l) MR Spectroscopy	(i) Proton MRS Sequence for single-voxel acquisition, with selectable fat /lipid saturation bands, options of water saturation (eg. VAPOR, CHRSS, etc) with all post-processing software. (ii) Proton Multi-voxel CSI (2-D and 3-D) acquisition and metabolite mapping with all necessary RF sequences (and post processing algorithms) with all post processing software (iii) MRS sequences for prostate, liver, musculoskeletal and brain (if there are any specialized/optimized sequence available, the same should be offered with all post processing software). (iv) Water and lipid suppression in automated sequences.
m) Cardiac package	Advanced cardiac applications: VCG gating, Morphology / wall motion; Cine perfusion imaging; myocardial viability imaging; Arrhythmia rejection technique; Advanced cardiac ventricular measurement analysis; Cine cardiac tagging technique; Coronary artery technique; real time interactive imaging; 2D/3D fast field echo / balanced / steady state techniques; Myocardial tagging, STIR for cardiac use, stress perfusion; 3D acquisition of whole heart in one breath hold; T1, T2, T2*imaging, 3D.MDE.
n) Musculoskeletal imaging	(i) High resolution imaging for cartilage and MSK. Parametric maps of T1, T2 and T2* (ii) Ultra low TE imaging (iii) Peripheral nerve/ plexus neurography and DTI imaging (quantitative latest)

Dr. Sukh Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

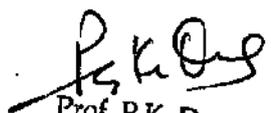
*P.K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

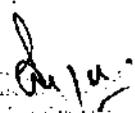
3T MRI system

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		(iv) Marrow Fat quantification
		(v) Metal artifact reduction software should be provided as standard for imaging of joints and spine with prosthesis.
	<b>o) Breast imaging package</b>	including MRS, dynamic contrast analysis, Perfusion imaging
	<b>p) MR Elastography</b>	<b>Package to be provided (both software and hard ware)</b>
	<b>q) Silent MRI</b>	Silent MRI including T1W, T2W imaging without any loss of image quality on all sequences (like Neuro Silent/ Silenz, or equivalent), with noise less than 80 dB. The quiet scanning should be without loss of SNR.
	<b>r) Advanced Compress Sensing imaging</b>	System should have the Advanced Compressed Sensing Imaging for high speed image acquisition for brain, body, MSK and cardiac (if available). Please specify acceleration factor, also offer simultaneously multi slab acquisition for diffusion and fMRI of the brain .
7	<b>Post Processing and evaluation</b>	(i) Licences of all the post processing and evaluation packages should be provided for the main console / workstations as mentioned. Post processing software should be provided for all sequences and packages mentioned in section 6 (e.g. ASL, DSC perfusion, DCE perfusion, Contrast kinetics, 2D and 3D MRS, CSF flow, Cardiac analysis, F-MRI, DTI and tractography, Fusion imaging, CSF Flow, relaxometry, DWI, liver fat quantification, liver iron quantification and <b>MR elastography etc</b> ).
	<b>a) MPR / MIP</b>	(i) Multi planar reconstruction (MPR) in any arbitrary plane including curved planes with freely selectable slice thickness and slice increments.
		(ii) Surface Reconstruction and evaluation on reconstructed images with minimum time.
		(iii) MIP in displaying in cine mode 2D and 3D mode, Targeted/segmented MIP in any orthogonal axis with minimum processing time and capable of displaying in cine mode.
	<b>b) ADC / Perfusion MR</b>	(i) Evaluation and display of diffusion images, ADC map, fMRI in reference of EPI optimized sequence.
		(ii) Perfusion image evaluation with time intensity graph and other statistical parameters
		(iii) Evaluation package for calculating rCBV, rCBF, MTT, perfusion map, corrected CBV calculation; Fusion of perfusion Contrast enhanced 3D T1 images etc. map with, Mention the package /software offered with brochure.
		(iv) Flow quantification and evaluation for vascular (high & low) CSF, bladder outlet and cine display.

Dr. Sukrit Kumar  
 Professor Junior Grade  
 Department of Radiodiagnosis  
 KGMU, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

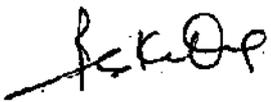


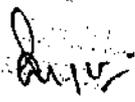
### 3T MRI system

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	c) Arterial Spin Labeling	2D / 3D ASL processing and quantification package
	d) Liver segmentation	Automatic Liver segmentation and volumetric analysis.
	e) BOLD analysis	(i) Evaluation of functional images of brain with appropriate statistical algorithms, colour display and overlay on base anatomical images (ii) Software for evaluation of functional mapping [BOLD Evaluation].
	f) Tractography	Post-processing package for DTI and Tractography, estimation of ADC, FA (Lambda parallel, perpendicular separately and combined), Fiber tracking, fiber statistics, and display of fiber tracts on anatomical images
	g) Image statistics	(i) Measurement of distance, area, volume, angle, mean, SD, image addition, subtraction, multiplication, division, interpolation, segmentation, threshold, histogram. (ii) Image filtering and Image fusion software. (iii) Software for co registering MRI/ fMRI/ MRS/ Metabolite mapping images with images from CT, PET, and SPECT. (iv) Evaluation features like zoom, rotation, scroll, roaming, image synthesis, multi point T1 and T2 calculation (more than 8) window stretching, text dialogues graphics, sorting, searchmfl, archiving, recalling etc.
	h) MR Spectroscopy	(i) Full post-processing for single-voxel MRS, CSI (multi-voxel MRS), metabolite mapping with colour coding (metabolic images) etc., for brain, prostate and for other applications. (ii) Post processing should include FFT, base line correction, curve optimization, automatic phase correction, metabolite imaging, spectral mapping, magnetic resonance spectroscopic imaging (molecular imaging) with naming and peak integral values for all in vivo metabolites
	i) Whole body fat quantification	Post processing software for whole body fat quantification
	j) MR Elastography	Post processing software for MR Elastography to be provided
8	Functional MRI, accessories and post processing	(i) Functional Imaging with package for BOLD imaging and processing package (capable of real time processing and display of colour overlay (in real time) using head coil being supplied with the system ii) Functional Imaging with package for BOLD imaging and processing package (capable of real time processing and display of colour-overlay (in real time) using Head coil being supplied with the system.

  
**Dr. Sukriti Kumar**  
 Professor Junior Grade  
 Department of Radiodiagnosis  
 KGMU, Lucknow

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

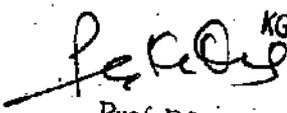


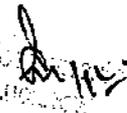
### 3T MRI system

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		(iii) Complete fMRI solution including audio visual projection (8D capable) system, with headphones with very good noise suppression (>30dB) (Preferable to have LCD/LED monitor projection).
		(iv) The system should be integrated with stimulus presentation/ paradigm generator software, along with permanent license (like Superlab, Nordic aktiva)
		(v) The paradigm presentation should be synchronized with the scanner (for starting along with measurements).
		(vi) Complete fMRI solution including audio visual projection (3D capable) system, with headphones with very good noise suppression (>30dB) (Preferable to have LCD/LED monitor projection).
		(vii) The system should be integrated with stimulus presentation/ paradigm generator software, along with permanent license (like Superlab, Nordicaktiva, Sensevue -In vivo Presentation, etc), telemed for task presentation to the subject.
		(viii) The paradigm presentation should be synchronized with the scanner (For starting along with measurements).
	Quality assurance and phantom	(i) Phantoms for routine quality assurance for all coils (including body coil)
10	Standard MR accessories	(i) Rechargeable Hand held metal detectors (2 Nos.)
		(ii) Non Magnetic Ferro guard door to be mounted outside the MRI room entry
		(iii) MR compatible Patient monitor physiological monitor (ECG, NIBP, SPO2] for neonates and Adults
		(iv) MR Compatible Dual Pressure injector / Volumetric infusion pump with 100 syringe sets and 100 patient tubing). Please quote the price of the consumables for the quoted MR Compatible pressure injector (valid for a period of five years).
		(v) MR compatible anesthesia machine
		(vi) Two quantity: Non-magnetic IV stand
		(vii) Two quantity: Digital Patient Weighing Scale (in the range between 0 to 200 kg)
		(viii) MR compatible storage carts and wall mounted cabinets.
		(ix) Coil cabinets to be provided.
		(x) MR compatible instrument-trolley - 1 no.
		(xi) MR compatible patient trolley - 1 no.
		(xii) MR compatible wheel chair - 1 no.
		(xiii) MR compatible laryngoscope ( 1 adult set and 1 pediatric set)
		(xiv) CCTV for patient waiting area with monitor and backup of month in console room

  
**Dr. Sukanti Kumar**  
 Professor Junior Grade  
 Department of Radiodiagnosis  
 KGMU, Lucknow

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLMS, Lucknow

  
 Dr. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLMS, Lucknow

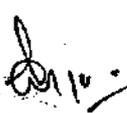
# 3T MRI system

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		<p>(xv) Uninterrupted power supply (UPS) with sufficient capacity for 30 minutes back up of the full load MR system, chiller and its accessories during patient MR imaging.</p>
		<p>(xvi) Two (quantity) MR compatible oxygen cylinders (for the anesthesia system)</p>
		<p>(xvii) Necessary furniture is required for console and reporting room of good quality (Godrej/ Geeken or equivalent). 1. Site fabricated appropriate size tables for workstations: as per number of nodes and working station. 2. Revolving midback chairs: 10 nos. (Godrej/ Geeken or equivalent). 3. Rack for coils: 1 no. (Depending on spare parts) 4. Site fabricated cupboards: 3 nos</p>
		<p>(xviii) Fire extinguisher Dry CO2 type of 4kg as required for the building safety - 2 no.</p>
12	Antivirus s/w and web updates	<p>(i) All the Servers and Workstations in the network (MRI console, additional workstation, fMRI workstation, etc) that is supplied by the vendor should be provided with antivirus software (periodically updated) during warranty and CMC period.</p> <p>(ii) The vendor should provide antivirus updates during warranty and CMC and make sure of the updated antivirus every week (using automatic- updates with internet facility by the vendor).</p> <p>(iii) The vendor should ensure that all the above modalities include necessary connection, image &amp; work list send/receive, image and data storage, scheduling, patient registration, and synchronization functions as per DICOM standards for smooth and effective integration to RIS/PACS</p>
13	Installation on-site modification (TURN-KEY) (a) General	<p>(i) The system should be installed and handed over in working condition, with all the necessary electrical, air conditioning and civil works undertaken by the vendor in Consultation with the user department.</p> <p>(ii) The vendor should inspect the site, before quoting and ensure that the unit can be installed in the available space without any functional compromise.</p> <p>(iii) All the necessary interconnecting interfaces, cables, modules and other hardware and software to fully integrate the system should be supplied by vender for full operational status.</p> <p>(iv) The installation of the MR system should be complete with all accessories.</p> <p>(v) The cost of Site Modification will be considered for L1 purpose.</p>
	b) Civil works	<p>(i) Complete equipment layout site plan and details of work (BOQ) should be part of technical bid.</p> <p>(ii) Provisions should be made for placing the various accessories in console room, work-station and printer locations.</p>

  
**Dr. Sukriti Kumar**  
 Professor Junior Grade  
 Department of Radiodiagnosis  
 KGMU, Lucknow

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Dr. Anil Kumar  
 Head of Department  
 Department of Radiodiagnosis  
 KGMU, Lucknow

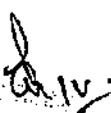
# 3T MRI system

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		(iii) It should also include Door with glass peeping window, warning indicators and signage, false ceiling, floor tiles and wall tiles/ Panelling/painting.
		(iv) All site modification works should comply with specified standards of the hospital.
		(v) Civil construction work including construction / demolition / alteration of brick wall, plastering, flooring as per the approved plan and equipment layout plan. The following rooms will be make: MR gantry room, console, Equipment room, UPS room. Concrete reinforcement required for MRI equipment area, if required.
		(vi) RF shielding for doors, walls, glass viewer per the requirement of the equipment.
		(vii) Platform for unloading and shifting the MRI magnet should be provided if necessary.
		(viii) Platform for Chiller unit if needed. Fencing and weather protection facility should be provided for the Chiller unit.
		(ix) MR compatible piping and outlets (4 lines) for medical air, oxygen, vacuum and O2 for gantry room. Hospital gas lines will terminate outside MRI area.
	<b>Flooring</b>	(i) Hospital grade Vinyl Flooring of reputed brands (eg. Armstrong, Gerflor, Tarkett or equivalent) for MRI Gantry room.
		(ii) 600 x 600 mm vitrified tiles with 100mm tile skirting to match in other rooms.
		(iii) 50 mm thick cement concrete flooring with Vinyl flooring in MRI equipment / UPS room.
	<b>Painting</b>	(i) Two coats Plastic Emulsion Paint over 2 coats of wall putty including primer in MRI equipment / UPS room and electrical room etc.
		(ii) Pre laminated particleboard wall panelling in MRI examination - Gantry room.
	<b>False ceiling</b>	Lightweight Aluminium ceiling panels, acoustical-treated, supported on grid or finished seamless with support above ceiling. Powder coated finish (colour to be approved by Institute). The False ceiling inside RF cage as per equipment and RF cage requirement and design. Ceiling height to suit the equipment mount and clearances.
	<b>c) Electrical work</b>	(i) The supplier shall be required to specify the total load requirements for the MRI scan centre including the load of air conditioning, room lighting and for the accessories if any. The mains supply line will be provided by the Institute up to one point within the MRI Scan centre area. The distribution panel shall be provided by the vendor. Few lights in each room shall connected to the UPS to provide emergency backing.

  
**Dr. Sukriti Kumar**  
 Professor Junior Grade  
 Department of Radiodiagnosis  
 KGMU, Lucknow

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

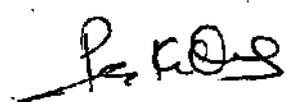
  
 Dr. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

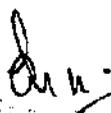
3T MRI system

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		(ii) The electrical work shall include the following: Wiring - All interior electrical wiring as well as wiring for hospital generator supply, chiller, and outdoor a/c units with main distribution panel board, necessary MCBs, DB, joint box, switch box etc.
		(iii) The wires shall be of copper of different capacity as per the load and should be renowned make as listed below. Electrical Earthing for all equipment & accessories supplied shall be provided by the vendor. The earth-pits should be located as per the approved by the Institute.
		(iv) MRI compatible lights for MRI examination room. The lamps/bulbs used within the RF cage should be easy replaceable and locally available.
		(v) Installation and integration of the uninterrupted power supply (UPS), as quoted.
	(d) Air conditioning and chiller	(i) Air-conditioning that is required for the MRI equipment, examination room, and Console areas have to be carried out by the vendor with a new unit. Proper ducting and other necessary work has to be carried out without damaging existing structure.
		(ii) Minimum 16 TR ( 10 TR working + 6TR standby) (The vendor has to provide and maintain adequate temperature and humidity for optimal function of MR system).
		(iii) Ductable split air conditioners and split AC units may be used according to room requirement and suitability. Humidity control should be effective to eliminate moisture condensation on equipment surface. The Airconditioning should be designed with standby provision to function 24 hours a day.
		(iv) The outdoor units of AC should be located as approved by the Institute and should have full coverings to prevent theft and damage. Copper pipes and valve panel to be used for the Chiller to the MRI.
		(v) Air conditioning load: The heat load calculations and maintaining of the desired temperature and humidity shall be the responsibility of the bidder, during warranty and CMC.
		(vi) Water/ Air chiller should be of good quality, with Performance guaranteed during summer months also.
	(e) Fire alarm & Detector :	(i) Fire / smoke alarm (along with new/ existing panel) should be provided in all rooms, wherever site modification is being carried out, and in the rooms (in the MRI section), where there is no fire alarm.
14	Certifications	<ol style="list-style-type: none"> <li>Should be US FDA approved from four digit notified body</li> <li>Should be CDSCO approved for Manufacturer or Importer</li> </ol>

  
 Dr. Sukriti Kuma  
 Professor Junior Grad  
 Department of Radiodiagn  
 KGMU, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

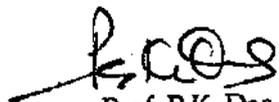
  
 Dr. Anu  
 Department of Radiodiagnosis  
 KGMU, Lucknow

# 1.5 Tesla MRI Machine

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DESCRIPTION	
None of the components or accessories supplied with the product should be refurbished	
<b>1</b>	<b>MAGNET</b>
a)	Whole Body 1.5Tesla Magnetic Resonance performance in Whole Body and neuro superconducting magnet, high-performance Imaging System optimized for higher & Cardiovascular examinations with gradients, and digital Radio Frequency System.
b)	It should have at least a 70 cm patient bore diameter. Total Magnet length including flared end should be less than 200 cm.
c)	Homogeneity of the magnet should be equal to or less than 0.80 ppm over 40cm DSV. Also, provide the datasheet for the same.
d)	The magnet should be well ventilated and illuminated with a built-in 2-way intercom for communication with patients.
e)	Cryogen vessel to be of Helium only with appropriate super thermal shielding and refrigeration facility for Zero Helium boil-off, Specify the Helium tank capacity and boil-off rate if any (should not exceed 0.03 lit/hr).
f)	Emergency helium release button should be provided at least In two places [inside MR examination room and console]. Facility for Helium level monitoring equipment in the magnet and console the room. Option of appropriate quick shutdown of the magnet in the event of an emergency.
g)	Helium refill time should not be less than 2 years. Please mention the helium refill time & should be covered under the warranty & CMC period
h)	The magnet should have a Digital Display of patient Demography & Coil connectivity.
i)	ECG triggering, peripheral triggering, and respiratory triggering gating be provided with wired, Bluetooth, or wireless sensors for the same.
<b>2</b>	<b>SHIM SYSTEM</b>
a)	High performance and highly stable shim system with global and localized automated shimming for high homogeneity magnetic field for imaging and spectroscopy. Both active & passive Shimming should be offered as standard.
b)	Auto-shim (global and voxel shim) should be available to shim the magnet with the patient in position
<b>3</b>	<b>GRADIENT SYSTEM</b>
a)	The actively shielded Gradient system
b)	The gradient should be actively shielded with each axis having slew rate of at least 200 T/m/s and a peak amplitude of 44mT/m, please specify the minimum rise time. The gradient and slew rate value must be actual and should not be compared to 44mT/m and 200T/m/s on the basis of equivalent performing TE/TR.
c)	The system should have efficient and adequate Eddy current compensation
d)	Effective cooling system for gradient coil and power supply -100% duty cycle
<b>4</b>	<b>RF SYSTEM</b>

Dr. Sukriti Kantar  
 Professor Junior Grade  
 Department of Radiodiagnosis  
 KGMU, Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow



1.5 Tesla MRI Machine

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a)	A fully digital RF system capable of transmitting power of at least 15 kw.
b)	It should also have at least 32 independent RF receive channels or channel independent with each having bandwidth of 1 MHz or more along with necessary hardware to support quadrature ICP array/Matrix coils. The system should also have an analog to digital convertor right at the source (Preferable).
c)	It should support Parallel acquisition techniques with a factor of at least 4 in 2D and should allow remote selection of coils and/or coil elements.
5	<b>PATENT TABLE</b>
a)	The table should be fully motorized, MRI Compatible with computer- controlled table movement in vertical and horizontal directions Position accuracy should be +/-1.0C. mm or better.
b)	It should be able to take a minimum load of 200kg or more.
c)	The table should have a facility for manual traction in case of emergency
d)	Cushions and other patient comfort accessories. All parts of the table should be protected from liquid spill
e)	The table should have a patient hand- held alarm system.
f)	The table should deliver the protocols for automatic bolus chasing in peripheral angio with automatic table movement.
g)	The system must be supplied with OEM make Electronically/Manual dockable patient table/Tabletop to Accelerate emergency egress – can be undocked and removed by single operator in under 30 seconds typically, and two -2 nos. of MRI Compatible Patient trolley
h)	Offered System must have the facility with Display on both Sides of the Gantry for patient data, Coil setup, and iso center positioning. The system must have the latest AI-based or equivalent touch-less respiratory sensors for sensing patient motion sensing.
6	<b>COMPUTER SYSTEM/ IMAGE PROCESSOR/ OPERATOR CONSOLE</b>
a)	The main Host computer should have 24 inches or more high- resolution LCD TFT color monitor with 1920 x 1200 dot resolution Ability to display DICOM images in 2048x2048 matrix
b)	The system should have an image storage capacity of minimum Hard disk storage 5 TB SSD.
c)	The main console should have a facility for a music system for the patient in the magnet room. The system should have DVD/ CD/ Flash drive archiving facility. There should be a provision for retrieval of the reconstruction data (raw files) in a user-friendly manner.
d)	Two-way Intercom system for patient communication.
e)	The system should be capable to connect to PACS through RIS/ HIS at no extra cost. The highest version of DICOM connectivity is to be provided.
f)	A necessary image processor with large RAM for ultra-fast image reconstruction should be provided it should be at least 64 GB RAM.
7	<b>MEASUREMENT SYSTEM</b>
a)	The largest Field of View should be at least 45 cm in all three axes.
b)	The measurement matrix should be from 128 x 128 to 1024 x 1024.

Dr. Sukrit Kumar  
 Professor Junior Grade  
 Department of Radiodiagnosis  
 KGMU, Lucknow

*P.K. Das*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

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c)	The system including all components, all accessories, and entire turnkey work should be under complete replacement warranty for five years from the date of issue of the installation certificate.
d)	Minimum Slice Thickness in 2D & 3D should be specified in relation to the sequences. Preferably for 2D 0.5 mm or better and for 3D, 0.2 mm or better.
e)	Able to perform ultrashort TE or less
8	<b>COIL SYSTEM</b>
a)	The system body Coil integrated into the magnet must be quadrature/CP. All array coils should be compatible with parallel imaging techniques. RF coils in addition to the main body coil (Transmit / Receive or receive coils) autotune, array, or no tune coils. Please specify the number of channels and elements available for each coil. Please mention the true acceleration factor for each of the array coils.
b)	The mode of coil attachment to the scanner system is wired as standard, at least three cable connectors are to be provided on the patient table or magnet.
c)	Multipurpose flex coils large (16 channel or more) for imaging of large shoulder, hip, brachial plexus etc.
d)	Multipurpose flex coils small (4 channels or more) for imaging small regions such as elbow, wrist, TM joint etc.
e)	Dedicated shoulder Coil-16 channel or more
f)	Dedicated Ankle Coil of 16 channels or more
g)	Dedicated Knee coil- 16 channels or more should be offered
h)	Neurovascular or Head and neck coil capable of high-resolution brain & Neurovascular Imaging with 20 or more channels.
i)	Spine Array/ Matrix Coils with at least 32 channels for Cervical, thoracic and lumbar spine Imaging in combination.
j)	Body Array /Matrix coil 32 channels or more. Coverage of the Body coil should not be less than 45 CM enabling whole abdomen imaging if any vendor does not have a single coil then the combination of two body coils should be offered to cover 45 CM Z-Axis FOV for imaging of the abdomen, angiograms, and heart
k)	The system should continuously monitor the RF coils used during scanning to detect failure modes. RF coils should not require either set up time or coil tuning; Multi coil connection for up to 2 or more coils simultaneously scanning without patient repositioning i.e. like 4GTIM/GEM/D stream coil combination should be quoted as standard.
l)	The supplier should quote coils or their combinations exclusively for each application. The number of coils should be as per the BOQ. It should be mentioned as independent coils and not have overlapping applications.
9	<b>APPLICATION SEQUENCES</b>
a)	The system should have a basic sequences package with Spin Echo, Inversion Recovery, Turbo Spin Echo with a high turbo factor of 256 or more, Gradient Echo with ETL of 255 or more, FLAIR. Ultrashort TE imaging for bone. Fast gradient spin echo, IR multi-slice multi-echo mode with maximum turbo factor Sequences should incorporate RF focusing acquire ultra-fast gradient spin echo.

Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

*P.K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCU  
Dr. RAILIMS, Lucknow

*Dr. ...*  
Dept. of Radiodiagnosis  
KGMU, Lucknow

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b)	Single slice, multiple single slices, multiple slices, multiple stacks, radial stacks, and 3D acquisitions for all applications.
c)	Single and Multi-shot EPI Imaging techniques with an ETL factor of 255 or more
d)	Fat suppression for high-quality images both STIR and SPIR.
e)	The system should acquire motion artifact-free images in T2 studies of the brain in restless patients (Prope Multi vane vane, Blade, etc)
f)	Dynamic study for pre and post-contrast scans and time-intensity studies
g)	MR angio imaging- Should have 2D/ 3D TOF, 2D/ 3D PC, MTS and TONE, CEMRA, Facilities for Accelerated time-resolved vascular imaging with applications like Treasts/ Tracks/ Tricks sequences or similar. Appropriate software packages should be offered.
h)	Latest technology platform systems offer upto 300 Diffusion Directions.
i)	Bolus chasing with automatic and manual triggering from fluoro mode to 3D acquisition mode with moving table facility.
j)	Non contrast enhanced peripheral angiography for arterial flow with Native/ Trance/enhance sequences, and Time-Resolved Angio 4D TRAK, TWIST and TRICS
k)	Whole-body MRI screening imaging studies for metastasis with stir/diffusion and neurography
l)	High-resolution Abdominal and Liver imaging in breath-hold and free-breathing
m)	modes with respirator triggered volume acquisitions.
n)	The system should have basic and advanced MRCP packages including free-breathing and 3D techniques.
o)	The system should have a facility for automated flow quantification of CSF and vessel flow.
p)	The system should have the Hydrogen, Single Voxel Spectroscopy, Multi voxel, Multislice & Multiangle 2D, 3D. The complete processing/ post-processing software including color metabolite maps should be available on the main console. Complete prostate spectroscopy hardware and applications should be provided. The complete processing Post-processing using software including color metabolite maps should be available on the main console and the workstation
q)	Perfusion Imaging of the brain (2D/ 3D ASL with complete automated post processing software).
r)	Susceptibility weighted imaging (i.e. SWI)/ Venous BOLD imaging.
s)	Multi-Direction DWI and DTI with a minimum of 128 directions (complete package including quantification and tractography software) for neuro brain and peripheral nerves.
t)	High-resolution imaging for the inner ear. 3D acquisitions like CUBE, SPACE, VISTA or similar.
u)	MR neurography software/ 3D Space Neurogram/ 3D Cube STIR/3D VISTA
v)	The system should have Silent MRI scans for protocols including TIW, and T2W imaging without any loss of image quality on all sequences with noise less than 80 dB. The quiet scanning should be without loss of SNR.
w)	Compensation for imaging metal implant

Dr. Sukrit Kumar

Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

*[Handwritten Signature]*

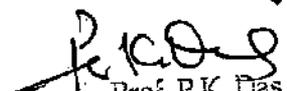
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

*[Handwritten Signature]*  
Dr. P.K. Das, Lucknow

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x)	The system should have a basic sequences package with Spin Echo, Inversion Recovery, Fast Spin Echo with a high turbo factor of 256 or more, Gradient Echo with ETL of 255 or more, single and Multi-shot EPI imaging techniques with ETL factor of 255 or more
y)	Single slice, multiple single slices, multiple slices, multiple stacks, radial stacks, and 3D acquisitions for all applications
z)	Fat suppression for high quality images both inversion recovery and Dixon method with variable TE and four contrasts in one acquisition viz water-only, fat-only, in-phase and opposed-phase
aa)	Magnetization Transfer Saturation
bb)	The system should acquire motion artifact free images in 12 studies of brain in restless patients using latest technique
cc)	Dynamic study for pre and post contrast scan and time-intensity studies
dd)	Whole body diffusion imaging
ee)	All basic and advanced sequences in 2D and 3D and all its variants should be offered including Dixon/ fat quantification, metal artifact reduction software/ latest cartilage quantification, SIENKE etc.
10	<b>WORKSTATION</b>
	Advanced post-processing offered application including perfusion quantification advanced diffusion, DTI, including perfusion analysis, processing of 2D/3D CSI data with color metabolite mapping fMRI Postprocessing (optional), CSF Flow quantification, Ejection fraction, cardiac flow measurement and Image fusion, neurography Sequences and Applications Package
	System Should be provided with client Server (at least 64 GB RAM) based workstation with Four clients and concurrent three licenses of each application. The workstation should enable printing in laser film camera and color printers. Each client should have at least 21-inch LCD TFT color monitor (medical grade), with hard disk of at least 5TB for at least 250,000 image storage in 512 matrix, and 64 GB RAM with self-playing DVD/CD archiving facility. A workstation from the Manufacturer with preferably the same user interface as of main console should be offered with following softwares."
I	<b>Neuro Applications</b>
a)	2D/3D Arterial Spin labeling
b)	T1 Permeability with I AUC, KTRANS etc and T2*Perfusion imaging of brain and other body parts with software for rCBV/ rCBF etc analysis. Evaluation package for calculating CBV, CBF, MTT, perfusion map etc. Post processing of perfusion should be available in console also.
c)	Susceptibility weighted imaging with phase contrast information to be provided
d)	Multi Direction DTI with a minimum of 128 directions (Complete package including DTI Quantification and tractography software).
e)	T2 Relaxometry and volumetry for Hippocampus
f)	Advanced Spine Applications package for nerve root analysis-nerve-sense
g)	High-resolution imaging for the inner ear.
h)	The system should have a facility for flow quantification of CSF, and vessel flow. Both retrospective and prospective gating should be possible.

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

Dr. Sakrati Kumar  
 Professor, Junior Grade  
 Department of Radiodiagnosis  
 KGMU, Lucknow

1.5 Tesla MRI Machine

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d)	Complete pro state spectroscopy hardware and applications should be provided
<b>11</b>	<b>SAFETY FEATURES</b>
a)	The System should have the following safety features: -
b)	The magnet system should include an Emergency Ramp Down unit (ERDU) for fast reduction of the magnetic field with ramp Downtime below 3 minutes
c)	The magnet should have quench bands that contain the fringe field storage specified value in the event of a magnet quench.
d)	Real-time SAR calculation should be performed by the software to ensure that RF power levels comply with regulatory guidelines and are displayed on each image
e)	The system shall have a manual override of the motor drive for quick display of the patients for the magnet bore
f)	Temperature sensor (built in) for magnet refrigeration efficiency must be provided
g)	A CCTV system with a color LCD /LED display to observe the patient transfer should be provided.
<b>12</b>	<b>DOCUMENTATION</b>
a)	DICOM Compatible Dry Chemistry Digital Camera and color printer with an integrated processor for filming from the main console & workstation.
b)	Printing on films of 8 X10, 10 x 12, 14 x 17 sizes in a resolution of 5000 f more dpi. It should be possible to connect other imaging modalities to the printer. (please specify the make as per your schedule rate contract)
<b>14</b>	<b>SUITABLE RF ENCLOSURE, TRAINING, and UPGRADE</b>
a)	RF Cabin: The system should be supplied with the RF cabin with RF room shielding Door, RF window, and Interiors for the same should be carried out suitably.
b)	Application support engineers should be assigned for at least 30 days in a quantum of 6 months to train the staff/ clinicians in the department.
c)	The MR system should be regularly maintained in the latest version of computing software, including software platform upgrades released for the respective system that can prepare it for future enhancements. If a hardware (HW) upgrade is required to run the latest software version to its normal performance, the respective HW should be upgraded at no additional costs during the complete life of the system.
d)	The MR computing software system should offer built-in security controls to protect the system from vulnerabilities that can result in cyberattacks or inappropriate access to patient data. The built-in security should comply with the latest international standards of data security and encryption, as well as with existing regulations to protect personal and protected health information (e.g., GDPR, HIPAA, any local regulation), during the complete life of the system.
e)	One week training for 2 radiologists to be provided in the advanced application of repudiated MRI centers/facilities to be provided."
<b>15</b>	<b>ACCESSORIES</b>
a)	Storage cabinet for all coils

Dr. Sukrit Kumar  
 Professor Junior Grade  
 Department of Radiodiagnosis  
 KGMU, Lucknow

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Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

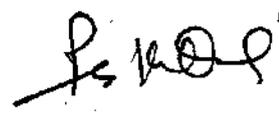
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1.5 Tesla MRI Machine

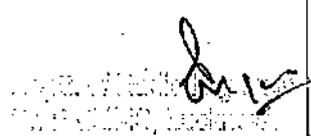
741

b)	MRI Compatible Dual Syringe Pressure Injector: Independent dual Syringe Pressure Injector with the following Features: Non-ferrous, automatic syringe size detection, performs single and dual phase-contrast Injections, provides Saline flush delivery Must be compatible with 5, 7 & 10 ml pre-filled contrast syringe and 50 ml syringes for both saline & contrast (100 Nos of 50 ml Syringes with 100 nos. of tube connectors should be provided) Must be able to observe the progress of Injection and view injection result at the working console.
c)	One MRI compatible Multi parameter Vital Signs Patient Monitor of 5000 Gauss/Compliance and One Slave monitor in console room with following modules provision to monitor the following (all MR compatible): Heart rate, Wireless ECG, SPO2, NIBP Size of Cuffs (adult & pediatric neonatal) 2 sets each, Respiration, Oxygen saturation- MR compatible Wireless Pulse oximeter with an adult, pediatric probe, and neonatal probes 2 sets each. Should have plethysmograph perfusion factor, ETCO2 and ETAA (end-tidal anesthetic agents), IBP Module 2 sets
d)	Hand-held metal detector- 02 nos.
e)	Walk through Ferromagnetic metal detector-01 no (Zone III)
f)	Suitable Online UPS with 30 Min Backup for entire system MRI System.
g)	LED- 3 films view box for 14" X 17" film size- 3 Nos.
h)	Test phantoms to calibrate and measure system performance
i)	MR compatible Wheelchair- 1No.
j)	"MRI compatible Anesthesia workstation with in-built ventilator - Volume Controlled Ventilation, Pressure Controlled Ventilation, Pressure Support, SIMV/PS, Manual Ventilation, Spontaneous Breathing; LCD colour screen; 2 vaporizers (Isoflurane & Sevoflurane); Carbon-dioxide absorber canister; Continuous monitoring of inspiratory O2 concentration, breathing frequency, tidal volume (expiratory), minute volume (expiratory), peak airway pressure, PEEP, and mean or plateau pressure; Audible and visual alarms; breathing systems (modules for Mapleson D circuit, Bain circuit and closed circuit); breathing circuits suitable for use in MRI environment (adult and neonatal).
k)	MRI compatible Syringe infusion pumps: 3 numbers capable of being stacked in a single cabinet (to be provided with pump). The pumps should have battery backup and a mechanism for providing infusion dose
l)	Others: a. Wall outlets (2 for compressed oxygen, 1 for air, 1 for N2O, and 1 for vacuum suction) b. MRI compatible wall suction apparatus: 1 c. MRI compatible Pressure transducer stand: 2 d. MRI compatible Magill's forceps: 3 sizes: Adult, pediatric, infant e. MRI compatible anaesthesia face masks - Sizes: 0, 1, 2, 3, 4, 5 f. MRI compatible temperature probes: adult & pediatric g. Endotracheal tube exchanger: 1 number; it should have the facility to administer oxygen h. Stylets for endotracheal tubes (adult & pediatric)
m)	Chiller for MRI System
	Emergency lights for examination and console room.

Dr. Sukriti Kumar  
Professor, Senior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow



Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. ANILIMS, Lucknow

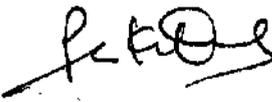


1.5 Tesla MRI Machine

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16	<b>SITE MODIFICATION WORK- 1.5 T MRI</b>
a)	The system should be installed and handed over in working condition with all necessary electrical, air conditioning, and civil work undertaken by the vendor in consultation with the user dept.
b)	The magnet should be shielded from external interferences. The MRI should be sited in such a manner; In order to minimize the effect of fringe magnetic field on surrounding areas. The areas lying within the 5 Gauss line should be clearly demarcated and cordoned off with an adequate warning.
c)	All site modification work is to be done by the bidder/ OEM and the responsibility of the bidding firm to follow all the specifications and guidelines of PWD/ CPWD for construction work and shall take all permission and NOC from the fire and electrical safety department at Bidder/ OEM quoted cost.
d)	All site modification work to be done at bidder/ OEM quoted cost.
e)	All electrical work is to be carried out by the bidder/ OEM quoting firm within their quoted cost.
f)	All Air Conditioning work in this area to be done at bidder/ OEM quoted cost and maintain during warranty and CMC period.
g)	All fire safety works in this area to be done at bidder/ OEM quoted cost including providing the fire extinguisher of required capacity and Tesla rating for MRI machine.
h)	All LAN & Networking works inside the MRI Machine room to be done at bidder/ OEM quoted cost.
i)	All required furniture for the MRI Machine room to be supplied at bidder/ OEM quoted cost.
j)	Fire Fighting System, Smoke Detectors in all rooms (except RF cabin), and 3 Fire Extinguishers all MRI Compatible
17	<b>Certifications:</b> <ol style="list-style-type: none"> <li>1. Should be US FDA approved from four digit notified body</li> <li>2. Should be CDSCO approved for Manufacturer or Importer</li> </ol>

Dept. of Radiodiagnosis  
M. P. S. H. S., Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

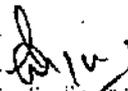
  
Dr. Sakruti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

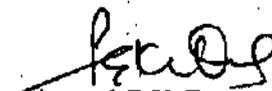
# Single Panel X-Ray Illuminator

743

## CONFIGURATION

- Number of Panels 1, single panel
- Viewing minimum sheet size of: 355mm X 432mm
- Luminance (Cd/square meter): 4000.0 - 6000.0 Or higher
- Material of the Front viewing screen: High quality Polymethyl Methacrylate (PMMA)
- Power Consumption less than 12 Watt

  
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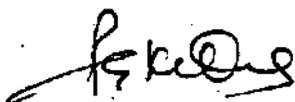
  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Surjit Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

CONFIGURATION

- a) Number of Panels: 2, Double panel
- b) Viewing minimum sheet size each panel: 355mm X 432mm
- c) Luminance (Cd/square meter): 4000-6000 Or higher
- d) Material of the Front viewing screen: High quality Polymethyl Methacrylate (PMMA)
- e) Power Consumption less than 24 Watt
- f) Should have option for controlling the brightness.
- g) Should have option for illumination of only the active panel either through sensor or switch.

  
Dept. of Radiodiagnosis  
Dr. RMLIMS, Lucknow.

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

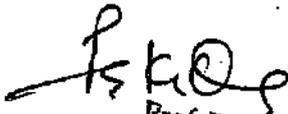
  
Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

745  
Tripple Panel X-Ray Illuminator

CONFIGURATION

- a) Number of Panels: 3, Three panel
- b) Viewing minimum sheet size each panel : 355mm X 432mm
- c) Luminance (Cd/square meter): 4000-6000 Or higher
- d) Material of the Front viewing screen: High quality Polymethyl Methacrylate (PMMA)
- e) Power Consumption less than 36 Watt
- f) Should have option for controlling the brightness.
- g) Should have option for illumination of only the active panel either through sensor or switch.

  
Dept. of Radiodiagnosis  
Dr. RMLIMS, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Sukriti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

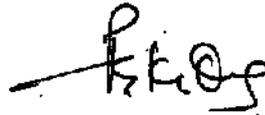
## Quad Panel X-ray Illuminator

## CONFIGURATION

- a) Number of Panels: 4, Four panel
- b) Viewing minimum sheet size each panel: 355mm X 432mm
- c) Luminance (Cd/square meter): 4000-6000.0 Or higher
- d) Material of the Front viewing screen: High quality Polymethyl Methacrylate (PMMA)
- e) Power Consumption less than 48 Watt
- f) Should have option for controlling the brightness.
- g) Should have option for illumination of only the active panel either through sensor or switch.



Dept. of Radiodiagnosis  
RMLIMS, Lucknow.



Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow



Dr. Suniti Kumar  
Professor Junior Grade  
Department of Radiodiagnosis  
KGMU, Lucknow

**Skill Lab**  
**(Simulation /**  
**Manikins)**



**Declaration Certificate about Technical Specifications  
related to Simulation by committee members**

SR. NO.	NAME OF EQUIPMENT	GO NUMBER	APPROX. COST
1.	ACLS MANIKIN NEONATE	GO-23-AUG-18 SUCHI-4	8,00,000/-
2.	ACLS MANIKIN PEDIATRIC SIMULATOR	GO-7-DEC-2022	85,00,000/-
3.	ACLS MANNEQUIN PEDIATRIC	GO-7-DEC-2022	17,50,000/-
4.	AIRWAY MANIKIN ADULT	GO-7-DEC-2022	4,00,000/-
5.	AIRWAY MANIKIN PEDIATRIC	GO-7-DEC-2022	3,00,000/-
6.	BLS MANIKIN ADULT	GO-7-DEC-2022	1,00,000/-
7.	BLS MANIKIN CHILD	GO-7-DEC-2022	1,00,000/-
8.	CHEST & LUNG EXAMINATION SIMULATOR (COMPREHENSIVE)	GO-23-AUG-18 SUCHI-4	55,00,000/-
9.	COMPREHENSIVE CARDIOVASCULAR EXAMINATION SIMULATOR	GO-7-DEC-2022	3,00,00,000/-
10.	CPR WITH MANNEQUIN (ADULT)	GO-23-AUG-18 SUCHI-4	5,50,000/-
11.	MANNEQUIN FOR DEMONSTRATION OF INTRAVENOUS INJECTION	GO-23-AUG-18 SUCHI-4	1,05,000/-
12.	VARIOUS ITEMS MEDICAL EDUCATION DEPARTMENT, SKILL LAB	GO-23-AUG-18 SUCHI-4	5,00,00,000/-
13.	SUTURING MANIKIN	GO-7-DEC-2022	4,50,000/-
14.	ACLS MANIKIN ADULT	GO-23-AUG-18 SUCHI-4	25,00,000/-
15.	HIGH FIDELITY SIMULATOR FOR EMERGENCY AND TRAUMA SCENARIOS	GO-7-DEC-2022 NEW ADDITION	3,60,00,000/-

This is to certify that technical specification of all the above-mentioned machine/instruments, approved by the technical committee is not of any specific company. The technical features of the equipment/instruments from all reputed firms in the current market have been included in this specification to the best of my knowledge and belief & in the opinion of the technical committee.

The technical specification duly signed by the technical committee members is attached herewith.

  
**Dr. Anil Kumar Verma**  
डा० अनिल कुमार वर्मा  
Medical College Kanpur  
एनेस्थीसियोलॉजी, इंटिकल केन्द्र  
एवं पेन मेडिसिन  
जी.एस.डी.एम. मेडिकल कॉलेज  
कानपुर

  
**Prof. P.K. Das**  
Chairman  
Technical specifications committee  
Clinical Subjects & others  
Head, Department of Anesthesiology & CCM  
DR RMLIMS, Lucknow

## ACLS Manikin Neonate

It should be a three-month-old infant with exceptional realism for individual training and realistic airway anatomy with tongue, oropharynx, epiglottis, larynx, vocal cords and trachea

It should be a portable skill trainer for realistic infant resuscitation training.

It should allow practicing of advanced resuscitation skills, including airway management, professional rescuer CPR, vascular access, and 4-lead ECG monitoring.

The manikin should have Brachial pulse (manual bulb)

It should allow practicing of bag-valve-mask ventilation, oral and nasal intubation, use of LMA (Laryngeal Mask Airway) and CPR.

- Ventilation via bag-valve-mask
- Endotracheal and nasotracheal intubation
- Auscultation of breath sounds
- Bilateral chest movement and stomach distention
- Oral/Nasal Airways
- Insertion of LMA (Laryngeal Mask Airway)

It should be supplied with a battery-powered ECG rhythm simulator designed to provide and train on following rhythms.

- 30 ECG Rhythms
- 17 Modified Rhythms including Torsade de Pointes
- 7 Pediatric Rhythms
- Special Features including paroxysmal, ignore shock and variable pulse strengths

It should have a feature of intraosseous needle insertion with aspiration of bone marrow and Sellick Maneuver teaching.

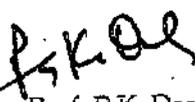
- It should allow practicing CPR with Bag Valve Mask
- Visible chest rise
- Chest compressions
- Should be supplied with 5 leg replacement pads, cleaning kit, airway lubricant, directions for use and a hard-plastic carry case and ECH rhythm generator.

**Demonstration, Installation and Training should be done by OEM only.**

### **sCertifications:**

- US FDA/ EU CE from 4 digit notified body/ BIS
- **Demonstration, Installation, Training, Service and Repair should be provided by OEM Only**

डॉ. अनिल कुमार वर्मा  
 आचार्य  
 एनेस्थीसियोलॉजी, क्रिटिकल केयर  
 एवं पेन मेडिसिन  
 जी.एस.टी.एम. मेडिकल कॉलेज  
 फतेहपुर

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## ACLS Manikin Paediatric Simulator

### General Conditions

1. The simulator Should allow allows learners to focus on a broad range of pediatric skills to gain exposure and practical experience of life-threatening pediatric problems.
2. The Simulator should be able to deliver high quality simulation experience by providing flexible training solutions such as training in sim suite set up, in-situ simulation and allowing faculty from remote location to control the simulator and debrief the participants.
3. Vendor should provide training on products (Technical) as well as simulation training. Training program should be three full day which should include from how to get started, to basic simulation, to advanced use of simulators, faculty development programs and customized training.

### Teaching Goals -

1. Advanced training in all aspects of pediatric care learning objectives focusing on initial assessment and treatment.
2. Practice of early assessment, diagnosis, and intervention
3. Team communication skills and continuity of care
4. Measure to improve resuscitation quality
5. Easy to handle

### Child simulator features -

Simulator should represent a 5-8-year-old child that can simulates a wide range of conditions from a healthy, talking child to an unresponsive, critical patient with no vital signs.

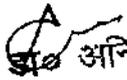
Simulator should allow learners to focus on a broad range of skills in order to gain exposure and practical experience of life-threatening pediatric problems.

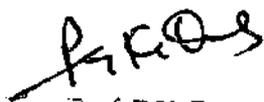
### Airway -

1. Realistic airway with landmarks
2. Oral and nasal intubation
3. LMA or ET insertion
4. Tongue oedema
5. NG tube
6. Cricoid cartilage
7. Head tilt and jaw thrust

### Breathing

1. Simulated spontaneous breathing
2. Observable chest rise
3. Variable respiratory rates

  
 अनिल कुमार वर्मा  
 आचार्य  
 एनेस्थीसियोलॉजी, क्रिटिकल कैयर  
 एवं पेन मेडिसिन  
 जी.एस.वी.एम. मेडिकल कॉलेज  
 कानपुर

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

4. Multiple upper airway sounds synchronized with breathing
5. Detect mechanical ventilations
6. Bag Valve Mask capable
7. Normal and abnormal breath sounds
8. Oxygen saturation and waveform
9. Breathing complications Left and right lungs can be either closed or opened to allow ventilations.
10. Bilateral chest movement with spontaneous breathing
11. Unilateral chest rise with right mainstem intubation
12. Unilateral and bilateral breath sounds
13. Left and right lungs can be either closed or opened to allow ventilations

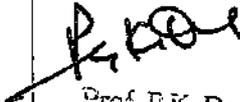
#### Cardiac

1. Defibrillation and cardioversion
2. Pacing
3. Extensive ECG library
4. Multiple heart sounds synchronized with ECG
5. ECG rhythm monitoring
6. 12 lead ECG display Chest Compressions
7. Compliant with 2015 AHA and ERC Guidelines
8. CPR compressions generate palpable carotid pulses, blood pressure waveform, and ECG artifacts
9. Detection and logging of a series of compressions in the data log
10. Blood pressure measured manually by auscultation of Korotkoff sounds
11. Bilateral carotid and unilateral brachial and radial (left side) pulses synchronized with ECG
12. Pulse strength variable with BP
13. Pulse palpation is detected and logged

#### Other Features-

1. Interchangeable pupils - Normal, Dilated, and Constricted
2. Convulsions
3. IV access
4. Intraosseous access
5. Simulates several parameters including: Heart rate, ECG, SPO2, NIBP, ETCO2, 12 lead ECG display
6. Should be controlled by PC as well has handheld touch device.
7. Should be provide with following trauma modules zygomatic lacerations, 1st, 2nd, 3rd degree burns, arm with road rash with fractured radius, abnormal healing of fractured radius, dog bite, electrical wire burn entry, tibia fracture, one thigh with closed femur fracture, one thigh with cigarette burns, foot with crushed toes, foot with electrical wire burn.

डा० अनिल कुमार वर्मा  
 आचार्य  
 एनेस्थीसियोलॉजी, क्रिटिकल केयर  
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 कानपुर

  
 Prof. F.K. Das  
 Professor & Head  
 Dept. of Anesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**System Features:**

- The system shall consist of a tether-less child manikin & wireless control unit.
- Should allow control of simulations from anywhere on your network
- Should have facility for multiple interfaces that can control/observe a single simulation

**Operating software**

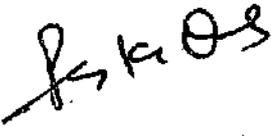
- The OS should be single and intuitive interface - shall be able to control and manage all simulators from one universal platform. It should help in finding scenarios, conduct simulation training, and develop new scenarios to help meet learning objectives with greater ease.
- It should have dual operating mode- User control mode for total control over all parameters and auto-mode/physiological which will help run pre-programmed scenarios in a simple and effective way. Logged events, as well as events detected by the patient simulator, should automatically drive the scenario forward.
- User friendly Operation - operating system should control parameters with drop-down menus and slider bars. Operating system should be capable of transferring radiographic images and procedural videos to the student screen.
- Patient Monitoring - Operating system should have patient monitoring capabilities to provide concise clinical feedback for physiological parameters including, SpO2, CO2, ABP, CVP, PAP, NIBP, TOF, and many more.
- Record and Review - Operating system should log time stamped comments to the data log, bookmark important events and capture notes throughout the simulation. Operating system should have straightforward logging capabilities and should allow integrated event log for more effective review, for improved learning outcomes.
- Scenario drafting tool - Operating system should have tool to create or convert scenarios which can be run with all simulators/manikins

**Demonstration, Installation and Training should be done by OEM only.**

**Certifications:**

- US FDA/ EU CE from 4 digit notified body/ BIS

  
 डा० अनिल कुमार वर्मा  
 आचार्य  
 एनेस्थीसियोलॉजी, क्रिटिकल केयर  
 एवं वेन मेडिसिन  
 जी.एस.पी.एच. मेडिकल कॉलेज  
 लखनपुर

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

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## ACLS Mannequin Pediatric

1. The manikin should be designed for AHA Pediatric Advance life support mega code station (PALS) as per latest AHA guidelines.
2. The model should be used for practicing ACLS for a 6-year-old.
3. The model should be realistic and look like a real 6-year-old child.
4. Should have following features: -

### Airway Management

- Realistic life-size intubation trainer with a flexible tongue, arytenoid cartilage, epiglottis, vallecula, vocal cords, trachea, esophagus, and simulated lungs
- Head can be tilted forward, backward, or rotated 90 degrees to either side
- The following skills can be practiced:
  - Endotracheal Intubation
  - Nasotracheal Intubation
  - Digital Intubation
  - Oropharyngeal airway insertion and suctioning
  - Nasopharyngeal airway insertion and suctioning
  - Bag-Valve Mask Ventilation

### Cardiac/Pulse

- Manually generated carotid pulse
- Manual chest compressions
- 3-4 lead ECG. With optional patient monitor: 12 lead ECG display image
- Pacing and defibrillation (25-360j)

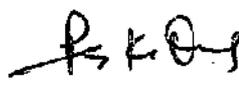
### IV/IO Training

- Articulating IV arm with replaceable skin and infusible vein system allows peripheral intravenous therapy and site care
- Venipuncture possible in the antecubital fossa and dorsum of the hand
- Accessible veins include median, basilic and cephalic
- Intraosseous infusion leg with tibial tuberosity and medial malleolus landmarks
  - Aspiration can be realistically simulated
  - Fluid can be infused

### Sounds

- Heart sounds synchronized with ECG
- Auscultated lung sounds synchronized with breathing, 0-60 BPM
- Individual lung sound selection
- Normal or abnormal bowel sounds.
- Vocal sounds: Computer-generated sounds, recorded vocal sounds and real-time voice input via headset

  
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आचार्य  
एनेस्थीसियोलॉजी, क्रिटिकल केयर  
एवं रेन मेडिसिन  
जी.एस.टी.एम. मेडिकल कॉलेज  
कानपुर

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology  
Dr. RMLIMS, Lucknow

- User generated vocal sounds

#### Touch Screen Control Unit

Should be Handheld, intuitive touchscreen remote for easy 'pick up and play' experience

- Mobile-teach anywhere
- Should have option to Operate on-the-fly or utilize scenarios and Themes for consistent simulation training
- Should record Time stamped activities, vital signs, and instructor comments in the event log
- Should have facility to view log files on the device for post-simulation reflection and debriefing
- Should have option to upload self-authored scenarios and Themes or download pre-programmed scenarios directly from relevant sources.

#### Patient Monitor

- Touchscreen simulated patient monitor should provide concise clinical feedback for physiological parameters.
- The monitor's color screen should be configurable and should provide multiple simulated parameters, each presenting multi-level alarms.
- Capable of attaching trauma modules
- Simulated parameters should include HR, ECG, SpO2, BP, RR, Temperature, and etCO2

#### Certifications:

- US FDA/ EU CE from 4 digit notified body/ BIS

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 आचार्य  
 एनेस्थीसियोलॉजी, क्रिटिकल केयर  
 एंड वैन मेडिसिन  
 जी.एस.ओ.एस. मेडिकल कॉलेज  
 धानपुर



Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

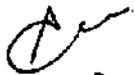
## Airway Manikin Adult

- It should be an upper torso of an adult.
- The manikin should have anatomically correct airway that should include nostrils, Lips, teeth, tongue, pharynx-oral and nasal, larynx with glottis opening, vallecula, arytenoids, vocal cords, sub glottis cricoid ring, trachea, including carina lungs, esophagus and stomach.
- The anatomy of mouth should give natural resistance for Intubation techniques
- Tracheal and esophageal intubation can be performed through oral and nasal.
- Supraglottic device placement should be possible like LMA, LTA.
- Sellick maneuver can be performed
- Fiberoptic and retrograde intubation can be performed
- Laryngospasm can be created for increased resistance of airway
- Lungs can be seen and has to have unilateral movement with right main stem intubation
- Manikin should also have stomach connected to esophageal pipe and should be able to simulate vomiting.
- It should be able to provide realistic checking for proper tube placement with visual inspection of lung expansion during ventilation, and auscultation of breathing sounds.
- Denture caring should be possible.
- To enhance quality of intubation technique, manikin should have audio signal during excessive pressure by laryngoscope on upper denture.
- It should be able to establish and maintain an open airway by head tilt, chin lift, neck lift and jaw thrust.
- It should permit realistic practice in lung ventilation, also with the use of Bag Mask Ventilation.
- It should be supplied with separate model for demonstration of airway anatomy.
- It must be able to provide the possibilities for practical training in clearing the obstructed airway by suctioning liquid foreign matter from, oral cavity, oro- or naso pharynx, oro- or naso trachea, via endotracheal tube. Gastric drainage may also be practiced.
- It should be supplied with a sturdy carrying case, directions for use, sanitation kit, lubrication spray and a container of simulated stomach contents.
- Manikin should be mounted on a board for easy practice

**Demonstration, Installation and Training should be done by OEM only.**

### Certifications:

- US FDA/ EU CE from 4 digit notified body/ BIS/ ISO

  
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 आचार्य  
 एनेस्थीसियोलॉजी, क्रिटिकल कैयर  
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 जी.एस.वी.एम. मेडिकल कॉलेज  
 कानपुर

  
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 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## Airway Manikin Pediatric

- The manikin should be anatomically accurate reproduction of a paediatric torso designed for teaching the differences in paediatric and adult anatomy for airway management procedures. The manikin should have the following features -
- Anatomically accurate airway allowing sizing and insertion of various airway adjuncts: Oropharyngeal and nasopharyngeal airway insertion
- Endotracheal tube insertion and securing
- Bag valve mask ventilation
- Tracheal suctioning
- Manually generated carotid pulse
- Closed chest compressions should be possible

The manikin should be supplied with 1 Pediatric Torso Trainer, 1 Can of Manikin Lubricant, 1 Carry Case and Directions for Use

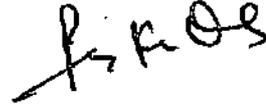
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### Certifications:

- CE/ISO certificate



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आचार्य  
एनेस्थीसियोलॉजी, क्रिटिकल केयर  
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जी.एस.डी.एम. मेडिकल कालेज  
कानपुर



Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

### BLS Manikin Adult

- Should be a torso manikin and relevant cloth should come along.
- Should be compliant with guidelines for CPR
- Feedback of CPR - Depth, recoil, rate of compression should be available on a handheld device or mobile device
- Feedback of proper and improper ventilation volume should be available
- Feedback of interruption time, pause time should be available.
- Manikin should also give feedback of CPR with results
- Manikin should be battery operated.
- Should have smooth and non-hazardous skin and true anatomy of the face with eyes, ear and nose for proper placement of mask and teach C-E technique for mask holding.
- Airway correction should be possible with Head-tilt/chin-lift and jaw thrust.
- Chest rise should be seen on manikin with bag valve ventilation.
- No chest rise should be seen if airway is occluded during bag valve ventilation
- Should have nipples, sternal notch, belly button and ribs to teach hand placement for chest compression.
- Should have removable face skin and extra skin should be provided with manikin.
- Should have collar bones to identify shoulder allowing to teach tap and shout.
- Should come along with direction for Use module, which can direct the user for easy care and maintenance.
- Software should be easily downloadable and multiple manikins can be connected with software at a time.
- Should have easy-to-use software on mobile device.
- Should be light weighted and can be carried by hand and learning can be done remotely.

**Demonstration, Installation and Training should be done by OEM only.**

**Certifications:**

- US FDA/ EU CE from 4 digit notified body/ BIS

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 आचार्य  
 एनेस्थीसियोलॉजी, क्रिटिकल केयर  
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 जी.एस.वी.एम. मेडिकल कॉलेज  
 कानपुर

*(Signature)*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## BLS Manikin Child

- Should be a half body pediatric manikin with cloths
- Should be compliant with guidelines for CPR
- Feedback of CPR - Depth, recoil, rate of compression should be available on a handheld device or mobile device
- Feedback of proper and improper ventilation volume should be available
- Feedback of interruption should be available.
- Manikin should also give feedback of CPR with results
- Manikin should be battery operated with rechargeable battery
- Should have smooth and non-hazardous skin and true anatomy of the face with eyes, ear, nose for proper placement of mask and teach C-E technique for mask holding.
- Should have nipples, sternal notch, belly button and ribs to teach hand placement for chest compression. Collar bones/Shoulders should be identifiable for teaching of tap and shout.
- Should have easy-to-use software on mobile device.
- Should be light weighted and can be carried by hand and learning can be done remotely.
- Airway correction should be possible with Head-tilt/chin-lift and jaw thrust. Chest rise should be seen on manikin with bag valve ventilation.
- No chest rise should be seen if airway is occluded during bag valve ventilation
- Manikin should come with disposable lungs at least 10

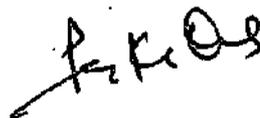
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 आचार्य  
 एनेस्थीसियोलॉजी, क्रिटिकल केयर  
 एवं पैलियेटिव मेडिसिन  
 जी.एस.पी. मेडिकल कॉलेज



**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## Chest & Lung Examination Simulator (comprehensive)

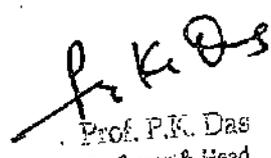
The complete system shall be able to facilitate and educate the basic nursing assessment to advanced clinical practicing with easy positioning and patient handling in a realistic way.

It should allow classroom skills lab to in-situ training, shall have wireless operation via a handheld remote or a PC allowing faculty to choose the right tools to fit their comfort level and training.

The system shall include a display of past, present and future scenario trending providing instructors with situational awareness during a scenario.

- The OS should be single and intuitive interface shall be able to control and manage all simulators from one universal platform. It should help in finding scenarios, conduct simulation training, and develop new scenarios to help meet learning objectives with greater ease.
- It should have dual operating mode- User control mode for total control over all parameters and auto-mode/physiological which will help run pre-programmed scenarios in a simple and effective way. Logged events, as well as events detected by the patient simulator, should automatically drive the scenario forward.
- User friendly Operation - operating system should control parameters with drop-down menus and slider bars. Operating system should be capable of transferring radiographic images and procedural videos to the student screen.
- Patient Monitoring Operating system should have patient monitoring capabilities to provide concise clinical feedback for physiological parameters including, SpO<sub>2</sub>, CO<sub>2</sub>, ABP, CVP, PAP, NIBP, TOF, and many more.
- Record and Review - Operating system should log time stamped comments to the data log, bookmark important events and capture notes throughout the simulation. Operating system should have straightforward logging capabilities and should allow integrated event log for more effective review, for improved learning outcomes.
- Scenario drafting tool - Operating system should have tool to create or convert scenarios which can be run with all simulators/manikins.
- The software must be open infrastructure for customized debriefing and a Video System application.
- Hardware of Simulator should be capable of upgrading the system for critical care training. Ventilator can be triggered by the simulator after upgradation in future.
- The integrated System should be capable of providing debriefing solution which captures and records audio and video of simulation and other learning activities.
- The system should be capable to record, replay and log the simulation event to give learners every opportunity to evaluate and assess each learning experience completely.
  - The System shall offer: High quality performance feedback for effective learning, easy-to-use audio and video set-up and control, Time stamped and searchable event log, Annotation and assessments.

डा० अनिल कुमार वर्मा  
 आचार्य  
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 कानपुर

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**Debrief-**

- The system should raise the value of debriefing by allowing the Instructors to evaluate or score simulations immediately for individual and group actions.
- The software should have the feature for Instructor to add comments and annotations.
- The system shall be able to identify actions associated with individual learners.
- The system should enable streaming of live video to multiple locations and View debriefing data on network from anywhere with web-based tools.

The manikin shall have realistic range of motions and articulations allowing it-

- Head can be flexed into chin to chest position and remain flexed until repositioned
- Sits unassisted and bends at waist to tripod position, forward sitting without back support
- Protective positioning
- Allows training on Patient transfer techniques
- Facilitate the passive Range of motion exercises

**Drug Delivery**

- Shall allow administration of eardrops
- Oral drugs via NG tube
- It shall have bilateral IV arms with capability for intravenous bolus or push through intravenous infusion when attached to a fluid bag via inline access.
- Shall also have optional female multi-venous IV training arm with capability of IV cannulation placement
- It shall have bilateral deltoid, ventral gluteal, dorsal gluteal and thigh injection sites
- Palpable anatomy to aid in site selection includes anterior superior iliac crest, pubic symphysis and greater trochanter
- It shall allow abdominal subcutaneous injection training with an injectable region.
- It shall have vaginal canal allows for insertion of vaginal suppositories or medications
- It shall have anal opening will accept real and simulated rectal suppositories

**Patient Care / Cleanliness Hygiene Training -Wound Care**

- It should allow hair care procedure training
- It shall have ear canal for practice of irrigation and cleaning
- It should allow oral care and hygiene training, denture care
- Shall also help teach for bed baths and skin care
- Patient care simulator shall allow manipulation into dorsal recumbent position for perineal care including separation of the labia for cleansing
- It should be able to take various positions to help teach students various patient positions for prevention of pressure ulcers.
- It should also facilitate the Bandage and binder application training
- Students can also learn and practice Nasal packing

डॉ. अजय कुमार वर्मा  
आचार्य  
एनेस्थीसियोलॉजी, क्रिटिकल केयर  
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जी.एस.वी.एम. मेडिकल कॉलेज  
कानपुर

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

- Dressing and dressing changes
- Toes spread for bandaging
- Shall have accurate anatomical landmarks for insertion of NG Tube to teach and practice correct measurement (nose to earlobe to xiphoid process)
- Students can learn and practice Lavage and gavage
- Shall have Invisible port in upper left, abdomen for pre-placement of a PEG or J tube for feeding
- Should have internal reservoir with 500mL fluid capacity, external quick fill port, and optional external bag for large volume feeding training and practice.

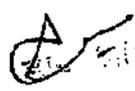
#### Training of catheterization and Bowel removal-

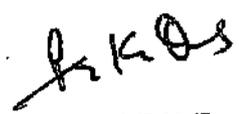
- Shall have female genitalia with realistic anatomy, includes labia majora, labia minora, urethral opening, clitoris, and vagina
- Labia minora in naturally closed position, when opened exposes urethral opening
- Should allow manipulation into supine position with knees flexed is possible
- The genitalia shall accept straight or indwelling catheters
- The genitalia should attach to an internal system including an internal urinary reservoir for urinary catheterization with ability to pressurize reservoir for proper fluid return
- Intermittent closed catheter irrigation
- The Urinary reservoir should have external quick access port for ease in filling
- Manipulation into Sims' position for enema administration should be possible
- Genitalia attaches to external reservoir bag for enema administration
- Anal opening will accept real and simulated rectal suppositories
- Ascending colostomy stoma with through hole connects to fluid reservoir for irrigation procedure
- Shall be able to create normal stoma, dusky stoma (non-perfusing), and infected stoma.

#### Airway Training features and Skills

- Shall have realistic airway with uvula, epiglottis, vocal cords and esophagus
- Teaching and training of various oxygen delivery methods with visible chest rise including nasal cannula, masks, trach collar/mask, CPAP device shall be possible.
- Bag-mask ventilation
- Suctioning (Oral & Nasopharyngeal)
- Concealed port in neck for insertion of tracheostomy tube
- Trach care tracheal suctioning with fluid
- Ventilations with chest rise
- Should be capable of ventilator training. Upgrading the simulator can trigger the real ventilator.

#### Resuscitation

  
 डॉ. पी.के. दास  
 प्राध्यापक  
 एनेस्थीसियोलॉजी, डिपार्टमेंट हेड  
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 कानपुर

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

- Shall allow learning of CPR
- Oral/Nasal Intubation
- Supraglottic Airway Insertion
- BVM Ventilation
- Head tilt/Chin lift
- Jaw thrust w/articulated jaw
- Sellick's Maneuver
- Chest compressions with maximum compression depth of 70mm
- ECG monitoring capabilities
- Defibrillation, cardioversion and pacing

#### Fluid, Electrolyte and Acid-Base Balance

- Should have port below the clavicle for pre-placement of central line catheter for site care, dressing change, flushing lines, and continuous or intermittent infusion
- Should have reservoir with 500mL fluid capacity, with option to use an external reservoir bag for large volume infusions
- Should have female multi-venous IV training arm with capability of IV cannulation placement, fluid administration and venipuncture as optional feature.

#### Clinical situation /Scenarios and Review

- Operating system is capable of operating via pre-programmed scenarios and modifiable parameters mode of the scenario in real time.
- Operating system can integrate with reviewing software, which combines synchronized student log, patient monitor display, live audio and video feed in a single debriefing file

#### Communication

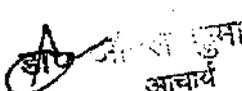
- The manikin shall have pre-recorded vocal sounds can be either played at a controllable volume, as a single occurrence or continuously repeated, including:
  - Cough, -Moan, Vomit, -SOB, Breathing (continuous sound), -Scream, "Yes", "-No"
- headset/ microphone allows user to talk through simulator

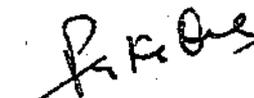
#### Eyes

- Shall have blinking eyes with adjustable blink rate
- The eyes shall be able to open, close or partially close for consciousness cueing
- Pupils can be set to normal, dilated, constricted.

#### Breathing/Respirations and Pulse

- Should have spontaneous breathing synchronized with selected breath rate (0-60 bpm)

  
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 Dr. RMLIMS, Lucknow

- Bilateral or unilateral chest rise
- Palpable pulse synchronized with ECG
- Adjustable in strength (weak, normal and strong)
- Bilateral carotid pulses (same pulse left and right)
- Brachial and radial pulses in the right and left arm, with right and left independent control
- Brachial pulse disabled and turned off if the pressure in the cuff is larger than 20 mmHg
- Radial pulse turned off when the pressure in the BP cuff is larger or equal to the set systolic BP
- Bilateral femoral pulses (same pulse left and right)
- Bilateral pedal pulses with right and left independent control

#### NIBP Training

- Bilateral measurement of non-invasive blood pressure (auscultated or palpated)
- Korotkoff sounds synchronized with programmable ECG
- Korotkoff volume control in 10 steps (0-9) available in both arms
- Auscultatory gap on/off feature
- Pressure range of 0-300mmHg

#### Sounds Auscultation

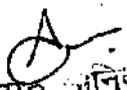
- Heart, lung and bowel sounds may be auscultated with real stethoscope
- **Lung Sounds**
  - Anterior and posterior lung sounds synchronized with the set breathing rate (0-60 bpm) and chest rise on the manikin
    - Normal, Coarse crackles, Fine crackles, Pleural rub, Pneumonia, Rhonchi, Stridor, Wheezes, No Sound
  - Lung sound and sound volume may be set individually for each lung - left and right, upper and lower
  - Anterior and posterior lung sound auscultation sites

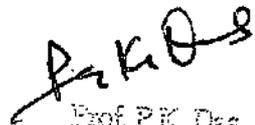
#### Heart Sounds

- Heart sounds synchronized with the ECG (QRS)
- Normal, Aortic stenosis, Austin Flint Murmur, Friction Rub, Mitral Valve Prolapse, Systolic Murmur, Diastolic Murmur, OS@70ms/ Open Snap MS
- Non-perfusing rhythms will not generate heart sounds

#### Bowel Sounds

- Four independently controlled auscultation areas for bowel sounds, centered around the umbilicus
- Volume control in each quadrant

  
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 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

- Bowel sounds are continuous repetitive sounds repeated infinitely
  - Normal, Hyperactive, Borborygmus, Hypoactive, No Sound
- Auscultation of fetal heart tones, instead of bowel sounds, are available for auscultation from the abdomen
  - Fetal Normal 140bpm, Fetal Tachycardia 200bpm, Fetal Bradycardia 100bpm

#### Anatomy

- Palpable anatomy for assessment and site location, including clavicle, sternum, spine, ribs (front and sides), xiphoid process, scapula, anterior superior iliac crest, pubic symphysis, and greater trochanter

#### Operation

- Completely wireless and self-contained Internal electrical and pneumatic power
- Shall also have supplemental wired connectivity and power
- It should also be wirelessly Integra table with existing computer networks

The Complete system shall be supporting the faculty for training and practice in the following areas of curriculum

I. Fundamentals of Nursing

II. Pharmacology

III. Health Assessment Training

VI. Nurse Orientation Training

V. Mental Health Training

IV. Medical-Surgical Training

VII. Annual Competencies

VIII. Assessment / Evaluation

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कानपुर



Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Comprehensive Cardiovascular Examination Simulator

Torso for physical assessment & auscultation

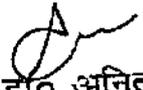
The system should be portable and light weight (weight should not be more 50 Kg) suitable to be used in any environment in which a patient may be examined. Small groups with stethophones may learn without an instructor by using the slide programs or software system.

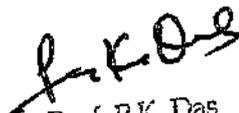
The machine may also be used in Clinical Skills or Medical Training Centers. Larger groups may be able learn in a lecture hall by using stethophones for auscultation and video projection for observing other physical findings.

The machine should function as a self-learning device.

The machine should have the following features-

- Cardiac Disease Cases (total 50)
- Standardized Patient Curriculum (total 10)
- Portable
- Breath Sound Areas (total 6)
- Cardiac Auscultation Areas (total 9)
- Digitally Driven Impulses (total 14)
  - Bilateral jugular venous impulses (2)
  - Bilateral carotid, brachial, radial and femoral arterial pulses (8)
  - Chest wall/precordial impulses (pulmonary artery, right ventricle, left ventricle, and displaced left ventricle) (4)
- Modifiable Amplitudes and Intensities
- Speaker for History-taking
- Multiple Learning Environments include:
  - Self-learning linked with online learning platform
  - Instructor in small group sessions
  - Lecture settings
- Normal
- Innocent Murmur
- Hypertension
- Mild Mitral Regurgitation
- Mitral Valve Prolapse, Combined Click and Murmur
- Acute Pericarditis
- Mild Tricuspid Regurgitation
- Chronic Severe Aortic Regurgitation
- Cardiomyopathy
- Severe Aortic Stenosis Addition of 10 New cases at rate of 90 BPM

  
 डॉ० अनिल कुमार वर्मा  
 आचार्य  
 एनेस्थीसियोलॉजी, क्रिटिकल केयर  
 एवं पेन मेडिसिन  
 जी.एस.वी.एम. मेडिकल कॉलेज  
 कानपुर

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

Standardized Patient Library - 10 cases (Printed and digital files)

### Core Curriculum Features

The machine should provide a comprehensive curriculum by realistically simulating 50 conditions. It should be structured to start with common, less complex conditions and progress to more rare and complex diseases.

- Introductory Program
- Normal (60 and 90 BPM)
- Innocent Murmur (60 and 90 BPM)
- Aortic Valve Sclerosis
- Hypertension (60 and 90 BPM)
- Angina Pectoris
- Acute Inferior Myocardial Infarction
- Acute Anterior Myocardial Infarction
- Ventricular Aneurysm
- Mitral Valve Prolapse (MVP) (60 and 90 BPM)
- MVP, Isolated Click and Murmur
- Mitral Regurgitation, chronic
- Mitral Regurgitation, mild (60 and 90 BPM)
- Mitral Regurgitation, mild (variant)
- Mitral Regurgitation, acute
- Mitral Stenosis (MS) with severe Tricuspid Regurgitation (TR)
- MS with mild TR (60 and 90 BPM)
- Mitral Stenosis & Regurgitation
- Aortic Regurgitation, chronic (60 and 90 BPM)
- Aortic Regurgitation, acute
- Aortic Stenosis (60 and 90 BPM)
- Hypertrophic Obstructive Cardiomyopathy
- Cardiomyopathy (60 and 90 BPM)
- Acute Pericarditis (60 and 90 BPM)
- Primary Pulmonary Hypertension
- Atrial Septal Defect
- Ventricular Septal Defect
- Patent Ductus Arteriosus
- Pulmonary Stenosis
- Coarctation of the Aorta
- Tetralogy of Fallot
- Coronary Disease with Heart Failure
- Mild Systolic Heart Failure
- Mild Diastolic Heart Failure
- Moderate Mitral Regurgitation

*Dr. Anil Kumar Verma*  
 आचार्य  
 एनेस्थीसियोलॉजी, क्रिटिकल केयर  
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 कानपुर

*P.K.D.*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

- Moderate Aortic Stenosis
- Mild Aortic Regurgitation
- Aortic Stenosis and Regurgitation
- Pulmonary Embolism
- Cor Pulmonale

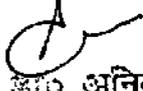
Should have option to add 10 New Cases (Optional)

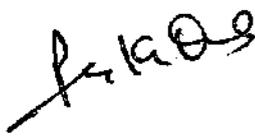
- Mild Systolic Heart Failure
- Mild Diastolic Heart Failure
- Mild Mitral Regurgitation (variant)
- Moderate Mitral Regurgitation
- Mild Aortic Regurgitation
- Coronary Disease with Heart Failure
- Moderate Aortic Stenosis
- Pulmonary Embolism
- Cor Pulmonale
- Aortic Stenosis and Regurgitation

**Demonstration, Installation and Training should be done by OEM only.**

**Certifications:**

- US FDA/ EU CE from 4 digit notified body/ BIS

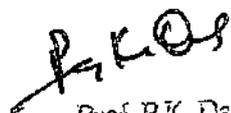
  
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 Dr. RMLIMS, Lucknow

## CPR with Mannequin (Adult)

- CPR Manikin with AW Headfull – full body adult
- Should be a full body manikin and relevant cloth should come along.
- Should be compliant with latest guidelines for CPR
- Feedback of CPR-Depth, recoil, rate of compression, hand positioning should be available on a handheld device or mobile device
- Feedback of proper and improper ventilation volume should be available
- Selection of CPR 30:2, 15:2 should be available.
- Manikin should also give feedback of CPR with final results
- Should have multiple eye pupil including dilated, normal, and constricted
- Should have multiple chest stiffness for training.
- The manikin should have anatomically correct airway that should include nostrils, Lips, teeth, tongue, pharynx-oral and nasal, vallecula, trachea, including carina lungs, esophagus, and stomach.
- Should have carotid pulse
- The anatomy of mouth should give natural resistance for intubation techniques
- Tracheal and esophageal intubation can be performed through oral and nasal.
- Supraglottic device placement should be possible like MA, LTA.
- Stomach distension should be seen if ET tube is misplaced to gastric line
- Manikin should be battery operated and should have to be rechargeable battery with charger
- Should have smooth and non-hazardous skin and true anatomy of the face with eyes, ear, nose for proper placement of mask and teach C-E technique for mask holding.
- Airway correction should be possible with Head-tilt/chin-lift and jaw thrust.
- Chest rise should be seen on manikin with bag valve ventilation.
- No chest rise should be seen if airway is occluded during bag valve ventilation
- Should have nipples, sternal notch, belly button and ribs to teach hand placement for chest compression.
- Should have removable face skin and extra skin should be provided with manikin.
- Should have collar bones to identify shoulder allowing to teach tap and shout
- Should come along with direction for Use module, which can direct the user for easy care and maintenance.
- Software should be easily downloadable and multiple manikins can be connected to the software at a time.
- Should have easy-to-use software on mobile device.
- The unit shall be capable of operating continuously in ambient temperature of 10-50°C and relative humidity of 15-90%.
- Shall meet ISO and CE certificate
- Should be upgradeable to IV Arm, Full Body, Bleeding control legs and Trauma Limbs

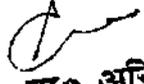
  
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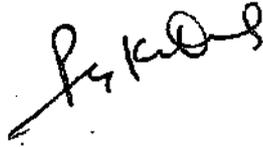
  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

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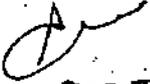
## Mannequin for demonstration of intravenous injection

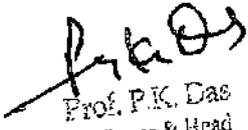
- Lifelike and anatomically correct adult-male arm with multi-vein system designed for peripheral intravenous therapy.
- Rotation at deltoid for easier anterior and posterior vein access
- Should have to be open-fist arm.
- Multiple injection sites for IV insertion: 3 numbers of Dorsal veins of hand and Median, Basilic and Cephalic vein access should be possible
- Touch and feel of arm and skin should comply high realism.
- feel and resistance at puncture sites should be real and simulated blood should come out after cannulation.
- Material of skin and vein should allow multiple pricks with no leakage.
- Veins should be palpable that enable site selection and preparation
- Subcutaneous and intramuscular injections may be performed in the deltoid
- Infusible veins allow peripheral therapy with IV bolus or push injection
- Should come with a carry case and clamp with hook for hanging blood bag.
- Should come with extra set of skin and veins.
- Set of simulated blood and cleaning lubricant should come along.
- Set of shoulder attachment hardware should be provided with user manual.

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 Dr. RMLIMS, Lucknow

## Various Items Medical Education Department, Skill lab

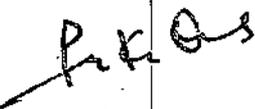
### 1. USG Guided Lumbar Puncture

The Ultrasound Epidural & Lumbar Puncture Model should be ideal to teach Lumbar Puncture or Epidurals using the ultrasound-guided technique. Should work on all major ultrasound brands & should include visible facet joints.

The Model should have following features-

- a. Should have life like anatomy Palpable sacrum, Iliac crests, Lumbar vertebrae between L2 and L5 with spinous processes
  - b. Simulator should give a distinctive pop feeling when puncturing the dura during an ultrasound guided lumbar puncture procedure
  - c. Needle insertion possible between vertebrae
  - d. Ability to feel when the dura is punctured during lumbar puncture
  - e. Realistic rate of cerebrospinal fluid (CSF) can be simulated
  - f. Performing procedures in a sitting and left lateral position
  - g. Identifying the iliac crests
  - h. Identifying landmarks under ultrasound - spinous processes, interspinous space and facet joints
  - i. Pre-puncture ultrasound mark up on the injection site
  - j. Real time ultrasound guided injection
  - k. Administering of local anesthetic injections
  - l. Administering of therapeutic treatments, e.g. antibiotics or chemotherapy medication
  - m. Administration of an epidural injection should be possible
  - n. Collection and measurement of cerebrospinal fluid should be possible
- ### 2. Chest Drain and Need Decompression Trainer
- a. It should have representation of adult male thorax with arms raised with realistic anatomy and true to life landmark.
  - b. It should have facility to perform bilateral needle decompression of tension pneumothorax
  - c. Should have facility to perform bilateral chest drain insertion. It can be used for training in surgical or guidewire assisted thoracostomy, and thoracentesis.
  - d. It should be complete with interchangeable modules, allows for a variety of chest drain insertion techniques to be performed including ultrasound-guided techniques.
  - e. Ultrasound-guided chest drain insertion (Seldinger-type), including insertion of needle under direct vision, and ultrasonic recognition of chest structures
  - f. Open, or cut-down chest drain insertion: recognition of correct position, surgical incision, blunt dissection through chest wall, perforation of pleura, and finger sweep
  - g. Suture of tube to chest wall
  - h. Suitable for supine, sitting, or leaning forwards positions
  - i. Bony and soft tissue landmarks: manubriosternal joint, clavicles, ribs, pectoralis major and latissimus dorsi
  - j. Internal ultrasound anatomy: diaphragmatic structures and collapsed lung
  - k. Can give the impression of breathing under ultrasound

डॉ. अनिल कुमार वर्मा  
 आचार्य  
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 एन.एम.जी. मेडिकल कॉलेज  
 लखनऊ

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLMS, Lucknow

- l. Works with thoracic seals when using the Standard Pad
  - m. Reservoirs can be filled with fluid or mock blood to represent pleural effusion
  - n. For use with liquids-e.g. effusion, or haemothorax
  - o. Needle, guide-wire, dilator, and drain-tube can all be realistically inserted
  - p. Guidewire insertions will self-seal allowing multiple uses
  - q. For open/surgical techniques where effusion or haemothorax are required
  - r. Open/surgical incisions will not self-seal
  - s. Pleural layer, providing realistic give, or "pop", on puncture with forceps or finger
  - t. Improved respiratory swing
- 3. Central Line Training Manikin**
- a. Center Line IV Access.
  - b. The central line training manikin should allow practicing of intravenous access techniques for both advance cardiac life support and trauma situation.
  - c. It should enable students to experience realistic procedures.
  - d. The puncture areas for IV access should be simulated by soft pads which should be covered by a realistic skin and should simulate the feel of human skin as closely as possible
  - e. Manikins veins inside the pads should provide a natural resistance during puncture and a natural flashback of blood.
  - f. Manikins veins and skin will self-seal so that the site of puncture is not visible to student.
  - g. The Manikins pads must pre-filled with simulated blood
  - h. It should enable the practice of IV access to the:
    - i. External jugular vein
    - j. Internal jugular vein via the anterior, central and posterior approach
    - k. Subclavian vein
    - l. Femoral vein
  - m. It should have a pulse bulb to enables the trainer to create a palpable pulse in the manikin's arteries
  - n. It should allow long catheters can be placed into the manikin.
  - o. It should have realistic tissue feel.
  - p. The neck pad and femoral pad should be replaceable without use of any tool
  - q. It should be supplied with 01 neck pad, 01 femoral pad, 250 ml bottle of simulated blood, User manual and carrying case
- 4. Cricothyroidotomy Trainer**
- a. Cricothyroidotomy and Tracheostomy Trainer
  - b. Manikin should mimic a complete head, mounted on a board with realistic facial anatomy and correct landmark for identification
  - c. It should have light tone
  - d. Should come with two type of tracheas: soft and hard.
  - e. Both trachea should have cricoid cartilage and tracheal rings (4)
  - f. Both trachea should have simulated lung and lung inflation can be seen if ventilation is given through tracheostomy tube.
  - g. Neck skin should be given along with the setup to enhance the realism.
  - h. Neck skin can either be punctured or can be cut to perform needle and surgical cricothyroidotomy.

डॉ० अनिल कुमार वर्मा  
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 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

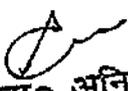
- i. Model should facilitate neck skin to be used multiple times.
- j. Hard trachea should support needle insertion of 16 or 18 gauge
- k. Soft trachea should support trachea tube of size 3 or 4.
- l. Can be cleaned with mild soap water.
- m. Items should include: Head, Hard trachea, Soft trachea, Simulated Lung, Retaining Band, Neck skin, Mounting Base

#### 5. Paracentesis Trainer

- a. Landmark or ultrasound techniques can be practiced (side by side)
- b. Internal echogenic anatomy should allow recognition of landmarks under ultrasound
- c. Two 3.5 It chambers can be filled with water for drainage practice
- d. Should have realistic tissue and needle response
- e. Should have self-sealing pads to withstand up to 200 needle or up to 100 rocket catheter insertions
- f. Should have ability to insert and remove drain
- g. Should allow both supine and lying on side position
- h. Skin surface should be washable using soap and water
- i. Should be Latex free
- j. Should be torso featuring bony landmarks and umbilicus
- k. Internal anatomy should include:
  - l. Liver
  - m. Spleen
  - n. Bowel
  - o. Floating Bowel
- p. Following Skills Should be Gained
  - q. Familiarity with the abdominal regions and underlying anatomy
  - r. Palpation of anatomical landmarks
  - s. Identification of excess fluid
  - t. Using ultrasound guidance, trainees can visualize the insertion site and check for vital organs beneath
  - u. Insertion of needle into the peritoneal cavity for therapeutic or diagnostic purposes
  - v. Professional-to-patient communication

#### 6. Abdominal Examination trainer

- a. Trainer or Simulated Patient should vary respiratory movement of liver and spleen by the turn of a wheel
- b. Should allow training in auscultation of normal and high-pitched or obstructed bowel sounds, renal and aortic bruits in variable locations
- c. Volume of bowel sounds can be adjusted, and should allow for additional sounds to be loaded
- d. Distension set should allow for the following: realistic checking for ascites using percussion, shifting dullness or fluid thrill technique and simulation of bowel obstruction on percussion and auscultation
- e. Pulse bulb should allow simulation of normal and aneurysmal aortic pulse
- f. Organs should be realistic on palpation and respond appropriately to percussion
- g. Quality of abdominal skin should be lifelike to accommodate stretching for gaseous distension and ascites simulation
- h. Realistic ballottement of enlarged kidney

  
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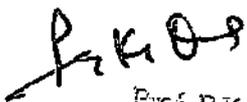
- i. Model can be rolled onto side for examination of ascites and shifting dullness
- j. Skin surface is washable using soap and water
- k. Latex free
- l. Anatomy
  - i. Torso featuring abdomen, pelvis and lower part of thorax
  - ii. Bony landmarks include ribs, costal margin, xiphisternum, pubic crest and anterior superior iliac spines
  - iii. 3 Livers: slightly enlarged, enlarged with smooth edge and enlarged with irregular edge
  - iv. 2 Spleens: slightly enlarged and markedly enlarged
  - v. 2 Enlarged Kidneys
  - vi. Distended Bladder
  - vii. 2 Aortas: normal and aneurysmal
  - viii. Set of 6 Abdominal Pathologies including 4 smooth masses and 2 irregular hard masses
  - ix. Distension Set including ascites bag, gaseous distension bag, pump and foam insert
  - x. Simplified representation of lower thoracic and lumbar spine
- m. Skills Gained
  - i. Familiarity with the abdominal regions and underlying anatomy
  - ii. Practice in abdominal palpation, auscultation and percussion
  - iii. Ability to recognize and differentiate a range of abnormal organs and pathologies Identification of ascites, specifically shifting dullness and fluid thrill
  - iv. Identification of gaseous distension and bowel obstruction
  - v. Ballottement of kidneys
  - vi. Professional-to-patient communication

#### 7. Enema & Catheterization Trainer

- Life-size female pelvis with interchangeable genitalia designed for practicing urologic and rectal access gastrointestinal care procedures.
- a. Should have realistic articulation enabling proper positioning for procedures
  - b. Should have Interchangeable male and female genitalia
  - c. Genitalia, when used with urinary connectors and reservoir, should facilitate urologic care procedures such as perineal care, insertion of vaginal medications and indwelling catheter insertion, care, irrigation and removal
  - d. Genitalia, when used with anal connectors and colon reservoir, should facilitate enema administration using fluid for realistic return
  - e. Should have abdominal plate with interchangeable stoma site, allowing simulation of cystostomy tube care and urinary diversion stoma care
  - f. Should have single plug with valve in abdominal plate, used to pressurize the reservoir during urinary catheterization procedures
  - g. Should have bilateral thigh, dorsal gluteal, and ventral gluteal IM injections possible

The kit should be supplied with 1 Female Pelvis with Thighs, 1 Male Genitalia, 1 Female Genitalia, 3 Urinary Connector Valves, 3 Anal Connector Valves, 1 Carry Case and Directions for Use

  
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 जी.एस.वी.एम. मेडिकल कॉलेज  
 बंगलूर

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

### 8. Newborn Resuscitation Manikin

- a. Should be newborn 0-6 month age with correct anatomical features.
- b. Should have realistic anatomy of airway and full body articulation
- c. Head tilt, chin lift and jaw thrust should be possible
- d. Bag valve ventilation with realistic chest rise
- e. Endo tracheal tube and supraglottic device can be placed.
- f. Oropharyngeal and naso pharyngeal intubation should be possible
- g. Oesophageal insertion with Stomach distension (when ET is misplaced)
- h. Meconium module for suction removal should be available
- i. Bilateral and unilateral chest rise movement should be possible with right mainstem intubation
- j. Practicing needle thoracentesis should be possible in left mid axillary
- k. Chest compression and recoil should be available for CPR practice
- l. Arterial and IV access through umbilical cord should be available with umbilical pulse
- m. Bilateral Tibial IO should be possible with interchangeable cartridge.

### 9. Breast Exam Manikin

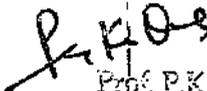
Breast Examination Trainer should provide a highly realistic learning platform for acquiring the skills required to Perform Clinical Breast Examination (CBE). Should feature 6 readily interchangeable and multi-positional pathologies, providing healthcare professionals with the tools to identify various complications and pathologies, including carcinomas, cysts, fibrocystic disease and fibroadenoma. Should be able to use as both Simulated Patient and benchtop training.

- a. **Should be used for following skills:**
  - i. Clinical breast examination (CBE)
  - ii. Self-breast examination (SBE)
  - iii. Identification of anatomical landmarks
  - iv. Identification of lymph nodes (axillary, supra & infraclavicular)
  - v. Location and diagnosis of pathologies
  - vi. Professional-to-patient communication
- b. **Product should have anatomy as:**
  - i. Realistic soft tissue breast anatomy
  - ii. Pathologies to be supplied: carcinomas: 2cm, 3cm, 5cm, cyst, fibrocystic disease, fibroadenoma
  - iii. Soft tissue breasts look and feel realistic Clavicular and axilla pads for accurate lymph node placement
  - iv. Can be used with a Standardized Patient
  - v. Pathologies can be placed in various predetermined location points and are easily changeable
  - vi. Hard torso to be supplied for bench top use
  - vii. Pathologies can be placed in various predetermined location points and are easily changeable

### 10. Female Pelvic Training Manikin with IUCD Training

The Female Pelvic Examination should be an anatomically accurate and tactile representation of the female pelvis. It should be ideal platform for hands-on examination as well as diagnosis of

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 आचार्य  
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 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

female conditions and minor pathologies. Can be used for many levels of training from undergraduate onwards, as well as in family health.

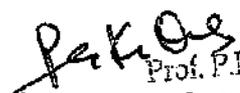
- a. **Should help gain following skills-**
  - i. Recognition of perineal and pelvic anatomy including bony landmarks
  - ii. Digital vaginal examination
  - iii. Bi-manual examination
  - iv. Cervical smear procedure (including use of speculum)
  - v. Digital rectal examination
- b. **Should be anatomically correct representation of -**
  - i. Abdomen, pelvis and genitalia
  - ii. Vagina, cervix, anus and lower bowel
  - iii. Interchangeable uterine modules with different complications
  - iv. Modules:
    1. Normal-Nulliparous Cervix
    2. Large Fibroid - Nulliparous Ectropion Cervix
    3. Small Fibroid - Nulliparous Polyp Cervix
    4. Ovarian Cyst - Multiparous Cervix
    5. Retroverted - Multiparous Cervix
    6. 10-12 Weeks Pregnant
    7. 14-16 Weeks Pregnant
  - v. Abdominal wall with fat layer makes palpation more realistic
  - vi. Labia can be parted realistically
  - vii. Each uterus is presented at the correct position
  - viii. anatomical angle
  - ix. Partial thighs aid anatomical orientation
  - x. Soft and strong perineum and labia
  - xi. Product should be latex free & Skin surface washable using soap and water
- c. **Should come along with IUCD Training module**
  - i. The trainer should consist of uterus training models with accompanying essential instruments for IUD insertion.
  - ii. **The trainer should allow comprehensive IUD training at all the three main stages.**
    1. A simplified human anatomical model of a Postpartum Uterus after birth: It supports training in postpartum intrauterine device insertion, uterine balloon tamponade insertions and other postpartum uterus interventions.
    2. A simplified human anatomical model with both an interval uterus and a post-abortion uterus: It supports training for a variety of sexual and reproductive health interventions such as vaginal examinations, IUD insertion and removal, and for inspecting anteverted and retroverted position of the uterus

## 11. Birthing Simulator with USG simulator

### a. Teaching Goals -

- i. The Simulator should be able to deliver high quality simulation experience by providing flexible training solutions in building competency to manage adverse events can impact patient outcomes.

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 एवं पेन मेडिसिन  
 जी.एस.जी.एम. मेडिकल कॉलेज  
 बालपुर

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

- ii. The simulator should be designed to train maternal care and critical obstetrics emergency skills, providing interdisciplinary training for various delivery scenarios and drills. These include normal delivery, breech presentation, assisted deliveries (forceps and vacuum), shoulder dystocia, cord prolapse, eclampsia and pre-eclampsia, maternal collapse, postpartum hemorrhage, sepsis, uterine inversion, and ruptured uterus.
- iii. General women's health care and complex obstetrical scenarios, all stages of labor, from ante partum to post-partum.
- iv. The simulator should be able to train ante natal care with non-gravid abdominal skin to expand the scope of your simulation training right from early stage pregnancy cases as well as non-pregnant female patient simulator.
- v. Integrated Ultrasound training to expand the scope of educational curriculum by integrating diagnostic training and assessments (POCUS)

### Ultrasound Training Cases

#### 1. First & Second Trimester Training

The module should focus on training of student's/caregiver's ability to care for pregnant patients who present with a variety of medical conditions. Student's/caregiver's shall have the opportunity to perform a point-of-care ultrasound examination, with 6 imaging windows from real-patient cases for each Scenario.

- a. Ovarian Torsion, Pregnancy of Unknown Location
- b. Acute Calculous Cholecystitis, Threatened Miscarriage, Viable First-Trimester Pregnancy
- c. Ectopic Pregnancy, Complex Left-Adnexal Mass, Dehydration
- d. Threatened Miscarriage, Viable First-Trimester Twin Gestation, Dehydration
- e. Obstructive Uropathy from Ureteral Calculus, Intrauterine Pregnancy of Uncertain Viability
- f. Ruptured Ectopic Pregnancy
- g. Acute Pericarditis, Viable Second-Trimester Intrauterine Pregnancy
- h. Hemoperitoneum, Hemorrhagic Shock
- i. Uremic Pericarditis with Cardiac Tamponade, Threatened Miscarriage First-Trimester Pregnancy
- j. Septic Miscarriage causing Severe Sepsis

#### 2. Third Trimester Training

- a. Students/ Caregivers shall have the opportunity to perform a point-of-care ultrasound examination, with 15 imaging windows from real-patient cases for each Scenario providing with exposure to a multitude of normal and pathologic ultrasound images. It should help students/Caregivers to develop an appropriate differential diagnosis, initiate timely resuscitative interventions, prioritize diagnostic interventions, order appropriate basic laboratory tests, and correctly acquire.

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आचार्य

एनेस्थीसियोलॉजी, क्रिटिकल केयर

एवं पेन मेडिसिन

जी.एस.वी.एम. मेडिकल कॉलेज

लखनपुर

*P.K.D.*

Prof. P.K. Das

Professor & Head

Dept. of Anaesthesiology & OCM

Dr. RMLIMS, Lucknow

- interpret, and apply point-of care ultrasound findings towards medical decision-making.
- b. The module should help teach student's/caregivers to use ultrasound to visualize a variety of second-and third-trimester pregnancies with cephalic, funic, and breech presentations.
  - c. Should also focus on training for the ability to
    - i. Quantify amniotic fluid amounts
    - ii. Obtain biparietal diameter (BPD), head circumference (HC), abdominal circumference (AC) and femur length (FL) measurements, calculating 4 different fetal gestational ages.
  - d. Other significant ultrasound training should include
    - i. Pericardial effusion,
    - ii. Poor cardiac contractility,
    - iii. A dilated right ventricle,
    - iv. A narrow-diameter IVC with major respirophasic change,
    - v. Hydronephrosis, renal cysts and calcifications,
    - vi. Gallstones and a thickened gallbladder wall,
    - vii. Free fluid in the hepatorenal and splenorenal spaces
  - vi. Following Scenarios should be present
    1. Eclampsia at 35-Week Pregnancy
    2. Hemorrhagic Shock, Placental Abruption, at 31-Week Pregnancy
    3. Vaginal Fluid Leakage, at 21-Week Pregnancy, Breech Presentation
    4. Acute Calculous Cholecystitis, at 31-Week Pregnancy
    5. Syncope, Abdominal Trauma, at 32-Week Pregnancy
    6. Peripartum Cardiomyopathy, at 38-Week Pregnancy
    7. Vaginal Bleeding, at 22-Week Pregnancy
    8. Pyelonephritis, Severe Sepsis, at 32-Week Pregnancy
    9. Tension Pneumothorax
    10. Pyelonephritis with Obstructive Uropathy, at 21-Week Pregnancy, Breech Presentation
  - b. The Adult simulator should have following features
    - i. The system shall consist of a tether less adult manikin Instructor PC, and a touch screen patient monitor.
    - ii. The simulator should look realistic and resemble the physique of a normal adult.
    - iii. The Software should run with mathematical models of physiology and pharmacology
    - iv. The simulator system should be completely wireless, rugged and self-contained internal electrical and pneumatic power, so that it will be easy for operations and can be used for mobile simulation.
    - v. The simulator should have and in-built battery backup.
    - vi. The manikin shall have an internal battery that will last at least 4 hours in normal usage or more.

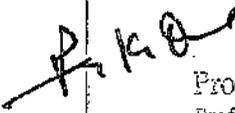
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 एवं पेन मेडिसिन  
 जी.एस.टी.एम. मेडिकल कालेज  
 कानपुर

*F.K.D.*

Prof. F.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

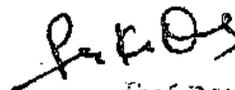
- vii. The internal compressor operational sounds shall not interfere with the auscultation of manikin sound
- viii. Should be able to perform an immersive labor and delivery simulations
- ix. Should be able to perform full articulation of arms and legs
- x. Should be able to position on all fours: 90-degree arm locking mechanism, realistic rotation of the shoulder and hip joints, and leg bends at the knee
- xi. Able to sits unassisted with fully articulating hip joints
- xii. Should be able to perform Seizures/convulsions
- xiii. Should support other positions: supine, semi-recumbent, left lateral, lithotomy, and McRoberts
- xiv. The internal compressor operation shall not cause unwanted manikin body movement
- xv. The maternal manikin should exhibit physiological response to adverse events automatically without needing operator intervention
- xvi. Should be able to perform PPH Scenarios using, Internal bleeding uterus for high-fidelity scenarios needing real fluids, Clean bleed mat for a seamless transition from birth to bleeding and quick clean-up.
- xvii. Should be able to have 1.5L internal and 5.0L external blood tanks to meet volume requirements or run simultaneous PPH scenarios without refilling.
- c. The maternal manikin should have optional capability to interface seamlessly with a clinical ventilator. Capability to trigger the ventilator is optional.
  - i. Cardiac Features should include,
    - 1. CPR compressions generate palpable pulses
    - 2. Should be able to perform blood pressure waveform, and ECG artifacts
    - 3. Able to deliver Realistic compression depth and resistance
    - 4. Able to Detect the depth, release, and frequency of compressions
    - 5. Should be able to perform Real time feedback on quality of CPR
    - 6. Should have Extensive ECG Library
    - 7. Should have heart sounds synchronized with ECG
    - 8. Able to have ECG rhythm monitoring when used with simulated patient monitor
  - ii. Circulation Features should include
    - 1. Should have Adjustable BP levels: systolic / diastolic
    - 2. Should be able to measure the BP manually by auscultation of Korotkoff sounds
    - 3. Should have Bilateral carotid, brachial, radial, femoral, and pedal pulses, synchronized with ECG
    - 4. Should have pulse strength variable with BP
    - 5. Should be able to detect pulse palpation
    - 6. Should supports NIBP
  - iii. Should support Deliveries and Drills features should include,
    - 1. Should support Occiput anterior delivery, Occiput posterior delivery, Breech delivery, Shoulder dystocia, Eclampsia and preeclampsia
    - 2. Should perform assisted deliveries: forceps and vacuum, Maternal collapse

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 कानपुर

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

3. Should be able to perform Sepsis
  4. Should be able to perform Cord prolapse
  5. Should be able to perform Placenta delivery
- iv. Airway features should include,
1. Should have Realistic airway with uvula, vocal cords, and oesophagus
  2. Tongue edema
  3. Should have Bilateral and unilateral lung blockage
  4. Should have Head tilt / chin lift
  5. Should have Jaw thrust with articulated jaw
  6. Should have Suctioning techniques (oral and nasopharyngeal)
  7. Should be able to perform Bag-mask ventilation
  8. Should be able to perform Oropharyngeal intubation & Nasopharyngeal intubation
  9. Should have the placement for Combitube, LMA and other airway device
  10. Should be able to perform Endotracheal intubation
  11. Should be able to perform Nasal and oral fiberoptic intubation, Right mainstem intubation
  12. Should Supports Sellick Manoeuvre
- v. Breathing features should include,
1. Should have the Spontaneous breathing synchronized with selected breath rate (0-60 bpm)
  2. Should have Variable respiratory rates
  3. Should have Anterior and posterior lung sound auscultation sites
  4. Should be Compatible with Breathing Lung Solution
- vi. Pelvis Anatomy should include,
1. The manikin should have Ischial spines & Pubic bone
  2. Should be able to perform Urinary catheterization
  3. Should have a 375mL urine reservoir
  4. Should have a Bi-manual compression
  5. The manikin should be able to perform Anus for post-delivery assessment & Rectal suppository simulation.
- vii. Abdomen features should include,
1. The manikin should have Palpable contractions
  2. The manikin should have Atonic and tonic uterus
  3. The manikin should have Suprapubic pressure sensing
  4. The manikin should be able to perform Fetal heart sounds
  5. The manikin should be Compatible with Ultrasound Solution
- viii. Vascular features should include,
1. Should be able to perform Pre-ported IV access in both arms.
  2. Should have Subcutaneous and intramuscular injection sites & Intraosseous access
- ix. Birthing Baby features,
1. Should be Realistic in weight and size of full-term neonate
  2. Should have the Palpable limbs and fontanelles
  3. Should have Anatomical landmarks to identify presentation of baby

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 लखनऊ

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

4. Should have Cuttable umbilical cord
  5. Should have Natural head flex
  6. Should have Open mouth
  - x. Other features should include,
    1. Should have a blinking eyes with adjustable blink rate
    2. Should be able to open, close, or partially close eyes for consciousness cue
    3. Should have pupillary accommodation: Synchrony / asynchrony
    4. Normal and sluggish speed of response
12. Extrication Manikin with Trauma kit
- a. Should have correct anatomy of face to place bag valve mask and immobilizing neck with neck collar.
  - b. Splints, traction and spine board application should be possible.
  - c. Should have to 5 and a half inch in height and 26 kg in weight.
  - d. It should be a full body adult male manikin with correct anatomical landmarks for extrication, immobilization and can be used for victim handling.
  - e. The manikin should mimic a full body to simulate patient handling in internal and external environment and must be extremely durable and rugged.
  - f. The manikin should have articulating limbs, knees, ankle, elbow, wrists and head to simulate real patient handling
  - g. Should have solid head with no opening.
  - h. Should come with IM injection sites at least on gluteal, vastus lateralis and deltoid.
  - i. Includes injuries required in 12 patient scenarios.
  - j. Over 30 wound lay-ons with Hook and Loop attachments allowing easy application and detachment Wounds include:
    - i. Head cover with scalp laceration
    - ii. Head cover with battle signs and blood in ear
    - iii. Head cover with lacerated forehead Face cover with lacerations and contusions on forehead and face and dilated pupil Face cover with burns
    - iv. Distended jugular vein Cervical spine injury (3 modules)
    - v. Flail chest segment with contusion (2 modules)
    - vi. Chest cover with 2<sup>nd</sup> and 3<sup>rd</sup> degree burns
    - vii. Chest plate with contusion on sternum (2 modules)
    - viii. Chest gunshot
    - ix. Pelvis contusion
    - x. Stab wound lower back
    - xi. Arm sleeve with 2<sup>nd</sup> and 3<sup>rd</sup> degree burns
    - xii. Gunshot entry upper right arm
    - xiii. Forearm with 2<sup>nd</sup> and 3<sup>rd</sup> degree burns
    - xiv. Open fracture left forearm
    - xv. Gunshot exit left forearm
    - xvi. Closed fracture radius
    - xvii. Closed fracture femur (3 modules)
    - xviii. Gunshot exit right leg
    - xix. Open fracture right lower leg
    - xx. Open fracture lower leg

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 कानपुर

*P.K. Das*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

- xxi. Impaled object
- xxii. Blood splats (10)
- xxiii. Comes with bottle of red simulated blood and a soft-side carry case

### 13. Pediatric IV Arm

- a. Arm should mimic to pediatric manikins and task trainers with replaceable skin and multi-vein system designed for peripheral intravenous access.
- b. Venipuncture should be possible in the antecubital fossa and dorsum of the hand
- c. Accessible veins should include median, basilic and cephalic
- d. Skin should be self sealable and has to be
- e. Kit should include: 1 Pediatric IV Arm-Right, 1 Replacement Skin and Multi-Vein System, 1 Bottle Red Simulated Blood, 1 Can of Manikin Lubricant, 1 Blood Bag with Tubing and Connector, 1 Clamp and Hook, 1 Set of Shoulder Attachment Hardware, 1 Carry Case and Directions for Use

### 14. Injection Trainer

- a. Multilayer Injection trainer pad should come with tightening strap to fix on different part of body for injection training.
- b. Pad layer should have multiple tissue layer of dermis, epidermis, fat, and muscle to practice intradermal, subcutaneous, and intramuscular injection training.
- c. Tissues of the pad should be soft and warm to create high realism.
- d. Epidermis layer should be easily peeled to release subcuticular liquid.
- e. Should be replaceable epidermis layer.
- f. The pad should have to be highly durable, and material of pad should be able take multiple pricks without replacement.

### 15. Intraosseous Trainer

- a. Designed for training in infant intraosseous infusion techniques.
- b. Should be mounted on a board
- c. Should allow Intraosseous needle insertion
- d. Should have Simulated tibia and anatomical landmarks at the tibial tuberosity and medial malleolus
- e. Fluid may be infused for realistic flashback
- f. Should be supplied with-with one Leg and five Intraosseous Pads

### 16. Arterial Arm

- a. Lifelike adult male arm reproduction with infusible arteries designed for training the proper arterial puncture procedure for blood gas analysis.
- b. Simulation of hand placement during performance of Allen's Test should be possible
- c. Flexible wrist should enable proper positioning
- d. Arterial pressure should be generated manually
- e. Artery palpation should be possible
- f. Should have percutaneous puncture sites in both brachial and radial artery
- g. Infusible arteries with ability to pressurize system, should enable blood backflow in syringe
- h. The kit should be supplied with 1 Adult Male Arm - Right, 1 Replacement Skin and Artery Set, 1 Bottle Red Simulated Blood, 1 Can of Manikin Lubricant, 1 Set of Shoulder Attachment Hardware, 1 Carry Case and Directions for Use

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काशीपुर

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**17. Infant CPR Manikin**

- a. Should be a full body infant manikin with articulating limbs. Relevant cloth should come along with manikin
- b. Should be compliant with ERC, AHA, SRFAC guidelines for CPR
- c. Feedback of CPR - Depth, recoil, rate of compression should be available on a handheld device or mobile device
- d. Feedback of proper and improper ventilation volume should be available
- e. Manikin should also give feedback of CPR with results
- f. Manikin should be battery operated and should have to be rechargeable battery
- g. should have smooth and non-hazardous skin and true anatomy of the face with eyes, ear, nose for proper placement of mask and teach C-E technique for mask holding.
- h. Airway correction should be possible with Head-tilt/chin-lift and jaw thrust.
- i. Chest rise should be seen on manikin with bag valve ventilation
- j. No chest rise should be seen if airway is occluded during bag valve ventilation
- k. Should have nipples, sternal notch, belly button and ribs to teach hand placement for chest compression. Collar bones/Shoulders should be identifiable for teaching of tap and shout.
- l. Should have easy-to-use software on mobile device.
- m. Should have one-way non-breathing lung and should come with extra lungs.
- n. Should be light weighted and can be carried by hand and learning can be done remotely.
- o. Should come along with direction for Use module, which can direct the user for easy care and maintenance.
- p. Software should be easily downloadable and multiple manikins can be connected with software at a time.
- q. Should be supplied with face mask, extra lungs, training mat and direction for use.

**18. Debriefing System**

- a. The system should be able to Automate, track and report on every aspect of simulation center's activities
- b. The system should be user-friendly and reliable
- c. The system should be able to reduce the workload of Simulation center activities
- d. Should be compatible with all High Fidelity Simulators

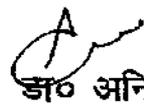
**i. Features**

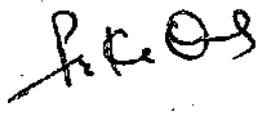
1. Capture and stream multiple angles of synced video
2. Capture simulator data and real medical devices
3. Annotate, debrief and assess
4. Secure, cloud-based storage and playback
5. Control access by role, department and organizations
6. Scheduling, self-enrollment, and center sign-in
7. Seamlessly integrated checklist and EMR builder
8. Large-scale and automated OSCE workflows
9. In-depth and customizable reporting
10. Flexible design and installation option
11. Synchronized capture of multiple camera angles
12. Simulator data capture and visualization
13. Medical device capture (EKG, Ultrasound, EMR)

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Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

14. Learner and faculty tracking and portfolios
  15. Center sign-in directs and tracks users
  16. Video annotation and session self-reflection\*
  17. Debrief from anywhere using just a browser.
  18. Learner, faculty and facility usage reports
  19. Customizable scenarios, roles and permissions
  20. Flexible and scalable one room or many
  21. Secure, mobile-friendly and cloud-based
  22. Training and 24/7 Support
  23. Checklist builder and custom assessments
  24. Fully customizable and integrated EMR
  25. Courses and curriculum tracking
  26. Robust and customizable assessment reports
  27. Scheduling, self-enrollment and notifications
  28. Resources and inventory management
  29. OSCE module for large-scale exams
  30. Lightweight Directory Access Protocol or Single Sign On module
  31. Debriefing features
  32. Simulation Instructors can annotate sessions, leverage simulator event and trend data, and administer learner self-reflection evaluations for a true 360-degree view during debriefing and when providing additional feedback to learners.
  33. The System should automatically track valuable information about program utilization such as total sessions; learner contact hours and recording hours. Reports can be filtered by scenario, organization, simulators and locations. They can also be exported to Excel to share with other educators or administrators
  34. System should be supplied with 1 fixed camera (HD), 1 PTZ camera (HD), 1 Monitor 24-inch HD
19. **Certifications:**
- a. US FDA/ EU CE from 4 digit notified body/ BIS
20. **Demonstration, Installation and Training should be by OEM**

  
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 कानपुर

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## Suturing Manikin

The trainer should contain the essentials for practicing suturing, knot tying, instrument handling and incision of skin, It can be used as a stand-alone teaching and practice tool

- The task trainer should help gain following skills-
- Instrument handling
- Planning and performing a skin incision
- Tying safe and secure knots
- Suturing techniques interrupted, continuous, subcuticular, vertical and horizontal mattress
- Suture removal

The product should have following features-

- Skin pad jig should present the skin pad on a curved, life-like profile allowing incisions to 'gape', as in real life
- It should have advanced 3 layer skin pad to give realistic tissue response and should be suitable for practicing a wide range of suturing techniques
- Should have realistic tissue response and soft skin with a similar drag and strength to human skin

All layers should have realistic retention of sutures

- Knot Tying Skills can be gained.
- One-handed reef knot technique
- Instrument tie
- Surgeon's knot
- Slip knot
- Tying in a small opening
- Tying at depth vertically in a large opening
- Tying at depth, at an angle, in a large opening

Should have Features

- Unique magnetic system to represent tissue strength
- 2 perioperative openings represented by: small, shallow fixed cylinder for tying in a small opening -large, deep removable cylinder, reversible for angled abdominal and gynaecological depth tying
- Cylinders should be transparent to allow the trainer to observe and assess trainee competence
- Parallel knotting tubes should be elastic for a realistic tissue response
- Light and compact Package

  
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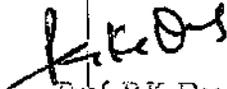
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जी.एस.वी.एम. मेडिकल कालेज

कानपुर

  
Prof. P.K. Das

Professor & Head

Dept. of Anaesthesiology & CCM

Dr. RMLIMS, Lucknow

Should be supplied with

- 1 Two Coloured Cord (atleast 3 packs)
- 3 numbers of knotting tube
- 1 base
- 1 small removable cylinder
- 1 large removable angled cylinder
- 1 knot tying tension hooks (atleast 3 sets)
- Should also have basic surgical Knot Tying Trainer along with Surgical Skills Board and Skin Pad Jig with Lesion & Cyst, Soft Tissue Retaining Set
- Skin Pad should compose of an epidermis, dermis, and subdermal layer and has a similar drag and strength to human skin. All layers should have a realistic retention of sutures.
- Haemostasias Pad should realistically mimic a tissue dissection containing a fluid-filled vessel.
- Should have a Double Layer Bowel for training in anastomosis techniques.
- Should have Abscess Pad and Traumatic Wound with realistic soft tissue including the skin, fat, muscle layers and foreign bodies
- Training manikin should come along with AOCT Frame
- Should have Professional AOCT Pad that uses a realistic 3 layered skin pad to represent the abdominal wall anatomy including Skin & adipose tissue, linea alba, and peritoneum.
- Should have Drain, Artery and Graft Patch
- It should be useful for learning advanced surgical skills with a range of tissue handling techniques.

It should help learn following skills

- Knots: One-handed reef knot, Instrument tie, Surgeon's knot, Slip knot, tying in a small opening and Tying at depth both vertically and at an angle
- Suturing techniques: Holding and manipulation of needles, interrupted, continuous and subcuticular Skin lesions and LA techniques:
- Excising a skin lesion and Excising a sebaceous cyst
- Haemostasias: Clip tie, Continuity tie and Pedicle transfixion
- Tissue handling-bowel: End-to-end interrupted sutures and End-to-end continuous sutures
- Fine tissue handling: Tendon repair
- Abdominal closure and drain insertion: Open abdominal wall, Insert drain and secure and Close abdominal wall with Aberdeen knot
- Excising: Skin lesions and Sebaceous cyst

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आचार्य  
एनेस्थीसियोलॉजी, क्रिटिकल केयर  
एवं पेन मेडिसिन  
जी.एस.वी.एम. मेडिकल कालेज  
कानपुर

*P.K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

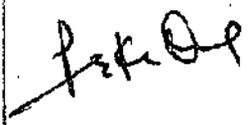
- Fine needle aspiration cytology and True cut biopsy
- Fine tissue handling: Vein patch exercise and Tendon repair
- Wound management: Abscess drainage, Traumatic and necrotic wound debridement.

**Demonstration, Installation and Training should be done by OEM only.**

**Certifications:**

- US FDA/ EU CE from 4 digit notified body/ BIS

  
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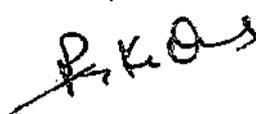
## ACLS Manikin Adult

It should be able to provide training in quality chest compression as per AHA and ISA protocols, with basic and advanced airway management skills training, vital signs analysis, spontaneous breathing and controlled by an easy-to-use wireless instructor System,

It should include:

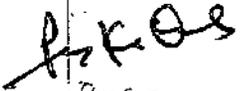
1. Full-body Adult humanoid model with training suit
  - a. Airway Management head
  - b. Articulating Lower body
  - c. Blood Pressure arm and cuff
  - d. IV Arm
2. Wireless control system
  - a. 2x AC Adapter, USB Cable
  - b. Blood pressure cuff
  - c. Artificial Blood and Airway Lubricant
  - d. Carrying case
  - e. User Guide
3. AIRWAY
  - a. Realistic airway anatomy including cricoid cartilage
    - i. Bag-Valve-Mask (BVM)
    - ii. Oropharyngeal and nasopharyngeal Airway
    - iii. Supraglottic Airway Devices
    - iv. Sellick Maneuver
  - b. Spontaneous breathing with realistic chest rises and fall
    - i. Controllable On/off & breathing rate
    - ii. SpO<sub>2</sub> and etCO<sub>2</sub> settings
  - c. "Chin lift" & "Jay thrust" and "Head tilt" sensors including tongue fall back
  - d. Airway closing mechanism
    - i. Overrides an open airway to simulate an obstruction at any time
    - ii. Open or closed airway status operated via wireless control
4. CIRCULATION
  - a. Eyes for pupil assessment
    - i. Normal-Dilated Constricted
  - b. Automatically generated pulses synchronized with ECG
    - i. Radial, brachial (right arm only) and carotid pulses both sides
    - ii. Pulse strengths dependent on BP or set individually
    - iii. Brachial pulse off when BP cuff pressure is above 20 mmHg
    - iv. Radial pulse off when BP cuff pressure is above systolic BP level
  - c. Auscultated and palpated blood pressure simulation
    - i. Korotkoff Sounds synchronized with ECG

  
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- ii. Systolic and diastolic pressure may be set individually in steps of 2 mmHg
- iii. Systolic 0-300 mmHg/diastolic 0-200mmHg
- iv. Auscultative Gap, with on/off feature
- v. Pressure accuracy +/-4 mmHg
- vi. Brachial and radial pulse control, palpated BP function
- d. Defibrillation capabilities (25-360))
  - i. 4-Lead ECG monitoring
  - ii. Synchronized variable rate, rhythm abnormalities and duration
  - iii. Pacing-threshold 20 to 200 mA
- 5. QCPR
  - a. Live feedback on Basic life support/ cardio-pulmo. resuscitation parameters
  - b. Detailed information about chest compression, compression rate, ventilation volume and combined graphical display
  - c. Cardio-pulmonary resuscitation Performance Summary
  - d. Debriefing Screen notes
- 6. Physiological Sounds
  - a. Lung sounds breath sounds synchronized with breathing rate
    - i. Normal, crackles, pneumonia, stridor, wheeze, rhonchi
  - b. Individual lung or bilateral sound selection
  - c. Vocal sounds - computer generated sounds, mixed with live voice input
  - d. Heart sounds - synchronized with programmable ECG
    - i. Aortic Stenosis, Friction Rub, Austin Flint Murmur, Diastolic Murmur, Systolic Murmur, Mitral Valve Prolapse, Opening Snap 70ms, Normal
- 7. Intravenous cannulation for dorsum of hand, Basilic, cephalic and median veins
- 8. Logging
  - a. Instructor can log activities and CRM skills during training sessions individually
  - b. Log files for debriefing sessions
  - c. cardio-pulmonary resuscitation log file for detailed debriefing
  - d. Downloading of logs for "after actions" review/debriefing via software
  - e. Software for detailed summary of student performance
- 9. Wireless Instructor Faculty Control
  - a. The system shall have the ability to manage the following parameters:
  - b. BLOOD PRESSURE/PULSES
    - i. The user shall be able to set the blood pressure level, and to make it gradually change over time.
  - c. TEMPERATURE
    - i. The user shall be able to set the temperature level, and to make it gradually change over time. Temperature can be presented in Celsius or Fahrenheit.
    - ii. Temperature shall be displayed on the Patient Monitor

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 Dr. RMLIMS, Lucknow

- d. PULSE OXIMETRY (SpO<sub>2</sub>)
- The user shall be able to set the peripheral capillary oxygen saturation level, and to make it gradually change over time.
- e. End Tidal CO<sub>2</sub> (etCO<sub>2</sub>)
- The user shall be able to set the etCO<sub>2</sub> level, and to make it gradually change over time.
  - etCO<sub>2</sub> can be presented in percentage, mmHg or kPa with individual selectable wave forms
- f. SOUNDS
- Heart sounds synchronized with ECG
  - Auscultated lung sounds synchronized with breathing, 0-60 BPM
  - Individual lung sound selection
  - Normal or abnormal bowel sounds
  - Vocal sounds: Computer-generated sounds, recorded vocal sounds and real-time voice input
  - User generated vocal sounds
- g. Patient Monitor
- The training system shall also have the ability to work with a real / simulated Patient Monitor. The patient monitor shall display ECG, SpO<sub>2</sub>, etCO<sub>2</sub>, BP, Respiration rate and Temperature controllable via wireless device.
  - Should be supplied with simulated real / simulated Defibrillator, AED trainer and Pacer. Patient Bed and one crash cart should be included in the supplies with one table.

10. Demonstration, Installation and Training should be done by OEM only.

11. Certifications:

- US FDA/ EU CE from 4 digit notified body/ BIS

  
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 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## HIGH FIDELITY SIMULATOR FOR EMERGENCY AND TRAUMA SCENARIOS

### Teaching Goal

- 1) The advance high Fidelity simulator should be designed to teach a diverse range of patient cases to help prepare students for real-world situations.
- 2) The simulator should allow learners use real time clinical devices, Equipments and instruments such as multi para monitor with ECG, Spo2, NIBP, EtCo2, mechanical ventilator, and video laryngoscope.
- 3) Should allow facilitating individual training, and team training in a risk-free environment.
- 4) System should be completely wireless and no tubing or anything should be attached during the running of scenario.
- 5) As part of high-fidelity simulator. The body of the simulator should be smooth. Touch and feel of the skin should be as good as a human body. Simulator with least visible nut and bolt will be preferred.

### Features -

- 1) The Simulator should be wireless, with inbuilt battery backup for 4 hours and in-built noise free compressor.
- 2) The Simulator should weight nearly 38 Kg male, with realistic palpable skin and resemblance of average adult Asian / Indian male. You have facility to customise the patient as young adult or geriatric patient and should allow facility to change the gender.
- 3) The simulator should be easily portable to demonstrate scenario from outside hospital to transport in ambulance to emergency department to OT. (wireless and no tubing attached)
- 4) The Simulator should have features modularity technology for future upgrade and customisation.
- 5) Should have facility to access pre-programmed and validated scenarios by leading society like AHA, AAP, international Simulation centres.
- 6) Should have access to more than 200 preprogrammed and validated scenarios.
- 7) Should have facility for in built ultrasound features focusing on POINT of CARE USG to integrate POCUS in training. Ultrasound should feature modules like cardiac, critical care, trauma etc..
- 8) Should have upgrade bleeding modules with amputated arm and legs.

### Airway Features -

- 1) The simulator should have a realistic airway with articulating mandible to perform jaw thrust and head tilt - chin lift.
- 2) Should have realistic anatomical landmark such as ear canal for measurement of NG tube, ETT, airway devices sizes.
- 3) Should allow suctioning through oral and nasal cavity.
- 4) Should allow bag mask and other methods of positive ventilation. The positive ventilations should allow visible shallow chest to rise and measure the volume of ventilation delivered.
- 5) Should allow use of real clinical airway instruments such as ETT, LMA, combi tube, supraglottic airway and other airway devices.
- 6) Should allow use of trans Jet ventilation, needle and surgical cricothyrotomy.
- 7) Should allow performing Sellick mauver.

  
 अनिल कुमार वर्मा  
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 लखनऊ

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

- 8) Should lead to right main stem intubation with deeper insertion of ETT.
- 9) Should lead to stomach distension with tube placed in oesophagus.
- 10) Should allow fibreoptic, and retrograde intubation.
- 11) Should be able to feel epiglottis to allow digital intubation.
- 12) Should be able to create tongue edema of two levels, Pharyngeal swelling, Laryngospasm, trismus, cervical range of motion and foreign body obstruction.
- 13) Should have presets to create can intubate and can ventilate conditions, Can't intubate and Can ventilate conditions, Can't intubate and can't ventilate conditions.
- 14) Should allow spontaneous breathing
- 15) Should allow bilateral and unilateral chest rise and fall
- 16) Simulator should have facility to exhale CO<sub>2</sub>.
- 17) Should have Normal and at least 13 numbers of abnormal breath sounds (5 anterior auscultation sites, 6 posterior auscultation sites) with feature to select different sound with multi-level volume setting at different sites.
- 18) Should have facility to use real Spo<sub>2</sub> probe to demonstrate Oxygen saturation and waveform in real clinical device.
- 19) Simulator should turn Cyanotic with drop in oxygen saturation.
- 20) Should allow performing Needle thoracentesis - bi-lateral
- 21) Should allow Unilateral & Bilateral chest movement
- 22) Should Unilateral, Bilateral & lobar breath sounds.
- 23) Should allow performing Chest tube insertion - bilateral.
- 24) Should have facility to adjust resistance and compliance at multiple levels.
- 25) Should have wireless respiratory system and control without any external unit.
- 26) Respiratory system should be completely compatible with real ventilators for ventilation training. Should have inbuilt lung capabilities to trigger ventilator and create lung complications.
- 27) Ventilator should be able to recognize the mechanical breathing of simulator.
- 28) Should have inbuilt scenarios of lung complications.
- 29) The simulator should be an adult male body with inbuilt lung creating real lung complication, which can triggered and treated by real ventilator
- 30) Should be able to hold PEEP .20 cmH<sub>2</sub>O
- 31) Simulator should create real respiratory scenarios: ARDS, COPD, Fibrosis, Bronchospasm, Pneumothorax, Right mainstem Intubation and the same can be procedure by the real ventilator.
- 32) Should be capable of creating bilateral lung resistance from 3 - 150 cmH<sub>2</sub>O/L/s with option to manipulate inhalation and exhalation.
- 33) Should be able to create bilateral lung compliance from 5 - 150 cmH<sub>2</sub>O/L/s
- 34) Should be capable of bronchial (Left & Right) and tracheal resistance.
- 35) Should have facility to select inspiratory time 0 - 100%
- 36) Should be capable of controlling patient's breathing Effort can be created with pressure ranging from 0 - 50 cmH<sub>2</sub>O.
- 37) Simulator should be able to control breath rate from passive to 100 bpm.
- 38) Ventilation mode can be set from Volume control to Pressure control seamlessly on the same patient without adjusting patient settings or interrupting a simulation.

#### Cardiac Features:

- 1) Should have wide range of ECG library synchronized with Heart rate, Blood pressure and pulse.
- 2) Should have facility to generate 12 lead ECG.
- 3) Should have facility to connect to 3-4 lead ECG machine.
- 4) Should allow live defibrillation upto 360 Joules , cardio version and pacing .

अनिल कुमार वर्मा  
 आचार्य  
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 लखनऊ

  
 Prof. P.K. Das  
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 Dr. RMLIMS, Lucknow

- 5) Should have at least 10 abnormal heart sound and murmurs synchronized with heart rate.
- 6) Heart sounds to be auscultated at 4 anterior locations.
- 7) Should be compliant with 2020 Guidelines and facility to upgrade to future guidelines.
- 8) Should have realistic physiology when QCPR compressions is performed leading to generate palpable pulses, blood pressure wave form, and ECG artefacts.
- 9) Should have realistic compression depth and resistance.
- 10) Should detect depth, release, and frequency of compressions.
- 11) Should provide real time feedback on quality of CPR.

#### Circulation Features:

- 1) Should have Oscillo metric BP measurement
- 2) Should be capable of measuring SPO2 with real SPO2 probe.
- 3) Should have all bilateral pulses: Carotid, femoral, brachial, radial, dorsalis pedis, popliteal and posterior tibialis pulses synchronized with ECG.
- 4) Should have pulse strength variable with BP.
- 5) Pulse Palpation is detected & logged
- 6) Detection of head tilt, chin lift, jaw thrust should be available
- 7)

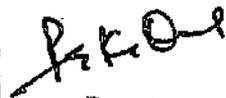
#### Vascular Access:

- 1) Should have bilateral IV access.
- 2) Should have bilateral humeral IO access.
- 3) Should have Intraosseous access (tibia).
- 4) IM sites: Bilateral deltoid IM and atleast one upper hip

#### Other Features -

- 1) Simulator should have eyes which can Blink - slow, normal, fast winks
- 2) Should be able Open, closed and partially open the eyes.
- 3) Should have automatic pupillary response to light
- 4) Face skins can be changed for different scenarios.
- 5) Should allow Pupillary to have synchrony/asynchrony , normal and sluggish speed of response.
- 6) Should allow Seizure/Fasciculation.
- 7) Should allow bleeding at upper and lower part of the body at multiple sites (4 blood source locations) with both arterial and venous bleeding.
- 8) Should have realistic physiological conditions like Vital signs automatically respond to blood loss & therapy.
- 9) Should have future predictions and patient outcomes display.
- 10) Should allow use and compatible with various wound modules & moulage kits.
- 11) Should have facility to have variable Urine output. (male and female genitals).
- 12) Should allow insertion of Foley catheterization with variable urine output (adjusted by software).
- 13) Should allow Secretions like sweat (Diaphoresis) , tears, CSF from ears , blood, mucous etc.
- 14) Should allow auscultation of atleast 7 Bowel Sounds - four quadrants
- 15) Should allow real time Patient Voice through instructor or standardized patient ,Pre-recorded sounds and Custom sounds.
- 16) Should have Articulating arms.
- 17) Should have option to send custom video and photo to patient monitor from instructor device.

  
 डॉ. अनिल कुमार दास  
 अध्यक्ष  
 एनेस्थीसियोलॉजी, क्लिनिकल शिक्षा  
 एवं रिसर्च विभाग  
 डॉ. एस. पी. मुखर्जी मेमोरियल कालेज  
 लखनऊ

  
 Prof. P.K. Das  
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 Dr. RMLIMS, Lucknow

- 18) Should have SpO2 measurement bilateral
- 19) Should have facility Interchangeable head skins.
- 20) Should have inbuilt Extensive drug formulary and Automatic recognition of drug and physiological application on simulator.

#### Technical Features –

- 1) Should allow to control multiple manikins from one interface
- 2) Should allow control simulations from anywhere on your network ( remote )
- 3) Should have facility by the OEM , to monitor the usage and functionality of the simulator.
- 4) Should have OEM trained service engineers.
- 5) Should provide training on the product and simulation-based education by International certified faculties.
- 6) Should be CE certified

#### Articulation of Body/Mobility Range

1. Should have axial rotation of knees, lumbar and axle
2. Should have multiaxial rotation/movement of shoulder, hip joint, neck wrist, elbow and next
3. Should have thumb movement
4. Manikin should be able to sit for examination. Mechanism to lock sitting position should be available.

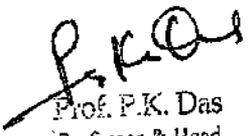
#### Patient Monitor:

Wireless Highly configurable Patient Monitor should include:

- 1) ECG (2 traces)
- 2) SpO2
- 3) CO2
- 4) ABP
- 5) CVP
- 6) ICP
- 7) Anesthetic Agent
- 8) PH
- 9) PTC
- 10) PAP
- 11) PCWP
- 12) NIBP
- 13) TOF
- 14) Cardiac Output
- 15) Temperature (core & peripheral)
- 16) Additional and programmable parameters
- 17) X-Ray Display
- 18) 12 Lead ECG Display
- 19) Custom Image Display
- 20) Custom Video Display

#### Should have Ultrasound features -

  
**डॉ० अनिल कुमार वर्मा**  
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 Dr. RMLIMS, Lucknow

Ultrasound module should be integrated into the simulator. This makes it easy to include diagnostic ultrasound featuring real ultrasound cases with pathological findings into full-scale simulations.

Should allow hand and eye coordination technique teaching in ultrasound.

Should be provided with Trauma Care Bundle for extended-focused assessment with sonography for trauma care (eFAST Protocol), Cardiac Resuscitation cases, Critical Care Bundle for rapid ultrasound for critical care (RUSH Protocol)

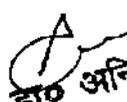
Ultrasound Modules should include Scenarios:

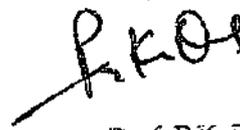
- False-Positive Hemoperitoneum, Blunt Trauma
- Hemoperitoneum and Coagulopathy, Blunt Trauma
- Hemoperitoneum, Blunt Trauma
- Hemothorax, Penetrating Trauma
- Hemoperitoneum and Hemothorax, Blunt Trauma
- Abnormal Mental Status, Blunt Trauma
- Hemoperitoneum, Blunt Trauma
- Tension Pneumothorax, Penetrating Trauma
- Hemopericardium, Penetrating Trauma
- Tension Pneumothorax, Blunt Trauma
- Hemorrhagic Shock, Blunt Trauma
- Moderate Hypothermia, Hypovolemic Shock
- Severe Gastroenteritis, Hypovolemic Shock
- Severe Sepsis, Deep Venous Thrombosis
- Severe Sepsis, Distributive, Hypovolemic Shock
- Acute Inhalational Injury, Blunt Trauma
- Ruptured AAA, Hemorrhagic Shock
- Severe Sepsis Complicated By Pericardial Effusion
- Severe Sepsis, Pneumonia, Cardiomyopathy, IUP
- Pneumonia-Related Severe Sepsis
- Pulseless Electrical Activity, Hyperkalemia
- Acute Ascending Aortic Dissection, Thoracic Aortic Aneurysm
- Massive Pulmonary Embolism
- Severe Sepsis with Pulmonary Source of Infection
- Anaphylaxis
- Cardiac Syncope, Hypertrophic Cardiomyopathy
- Cardiac Tamponade
- Hypertension, Dehydration, Electrolyte Imbalance
- Tension Pneumothorax
- Acute Coronary Syndrome

**Demonstration, Installation, Training, Service and Repair should be provided by OEM Only.**

**Certifications:**

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 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

# Surgery



**Declaration Certificate about Technical Specifications  
related to Department of Surgery by committee  
members**

Sr. No.	Name of Equipment	GO number	Approx. cost
1.	ALLIS FORCEPS-6 INCHES	GO-23-Aug-18 Suchi-4	6000 – 7000
2.	ALLIS FORCEPS-8 INCHES	GO-23-Aug-18 Suchi-4	6500 – 7500
3.	ARTERY FORCEPS	GO-23-Aug-18 Suchi-4	1.5 Lacs
4.	ASSORTED MISC INSTRUMENTS FOR MINOR OT	GO-28-Dec-17 Suchi-1	2 – 2.5 Lacs
5.	BASIC INSTRUMENT SET (SURGERY) or SURGICAL INSTRUMENT SET	GO-06-Mar-18 Suchi-3	18-20 Lacs
6.	BED PAN	GO-23-Aug-18 Suchi-4	1000 – 1200
7.	BOWL STERILIZER (LARGE)	GO-7-Dec-2022	1500 – 1800
8.	BOWL STERILIZER (MEDIUM)	GO-7-Dec-2022	1200 – 1500
9.	Basic C ARM (MOBILE)	GO-7-Dec-2022	35 Lacs
	Advanced C ARM (MOBILE)		1.3 – 1.4 Crores
10.	CAUTERY MACHINE or SURGICAL DIATHERMY MACHINE or ELECTROCAUTERY MACHINE	GO-7-Dec-2022	9-10 Lacs
11.	ELECTROSURGICAL UNIT WITH VESSEL SEALER	GO-28-Dec-17 Suchi-1	18 – 20 Lacs
12.	CHEATLE FORCEPS	GO-23-Aug-18 Suchi-4	12,000 – 15,000
13.	CIDEX CHAMBER	GO-23-Aug-18 Suchi-4	7000 – 8000
14.	CUSA EQUIPMENT	GO-1/112605/2021	90 Lacs
15.	DRESSING DRUM 9 X 11 INCHES	GO-23-Aug-18 Suchi-4	5000 – 6000
16.	DRESSING DRUM 12 INCHES	GO-23-Aug-18 Suchi-4	5000 – 6000
17.	DRUM 15 INCHES x 12 INCHES	GO-23-Aug-18 Suchi-4	6000 – 7000
18.	DRESSING INSTRUMENT SET (SURGERY)	GO-06-Mar-18 Suchi-3	2 – 3 Lacs
19.	DRUM STERILIZER SET	GO-23-Aug-18 Suchi-4	40000 – 45000
20.	ENDO STAPLERS	GO-7-Dec-2022	9 – 10 Lacs
21.	ENDOSCOPES (SEMI RIGID VIDEO THORACOSCOPE) or THORACOSCOPE (SEMI RIGID PLEURAVIDEOSCOPE)	GO-7-Dec-2022	65 -70 Lacs
22.	ENDOSCOPY SYSTEM (ENDOVISION SET)	GO-7-Dec-2022	55 – 60 Lacs
23.	ENDOSCOPY SYSTEM (HIGH-DEFINITION CAMERA SYSTEM)	GO-7-Dec-2022	22 – 26 Lacs
24.	ENDOSCOPY SYSTEM (HIGH END 4 K LAPAROSCOPY SYSTEM WITH ICG NIR)	GO-7-Dec-2022	1.25 Crores

*[Signature]*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

*[Signature]*  
**Dr Vikas Singh**  
 MS FAGES FMAIS FICS FCLIS FALS-HPB  
 ATLS Course Director  
 Professor  
 Incharge - Unit 3  
 Department of General Surgery  
 Dr Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)

*[Signature]*  
**Dr. Rohit Srivastava**  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

*[Signature]*  
 Supta  
 FAGES  
 Dept. of Surgery  
 S.N. Medical College, Agra



**Declaration Certificate about Technical Specifications  
related to Department of Surgery by committee  
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25.	ENDOSCOPY UNIT (LAPAROSCOPIC TROCARS & TELESCOPES)	GO-7-Dec-2022	9 – 10 Lacs
26.	ENDOSCOPY UNIT (LOWER GI - HD) or COLONOSCOPE	GO-7-Dec-2022	35 – 40 Lacs
27.	ENDOSCOPY UNIT (UPPER GI - HD) or VIDEODUODENOSCOPE or ESOPHAGOSCOPE	GO-7-Dec-2022	35 – 40 Lacs
28.	EQUIPMENT TRAY (12 X 10)	GO-23-Aug-18 Suchi-4	5000 – 6000
29.	EQUIPMENT TRAY (12 X 15)	GO-23-Aug-18 Suchi-4	6000 – 7000
30.	FORCEPS	GO-23-Aug-18 Suchi-4	2 – 2.5 Lacs
31.	HEIGHT SCALE	GO-23-Aug-18 Suchi-4	1200 – 1400
32.	ICD TRAY	GO-23-Aug-18 Suchi-4	1 – 1.2 Lacs
33.	INCISION & DRAINAGE SET (SURGERY)	GO-06-Mar-18 Suchi-3	1 – 2 Lacs
34.	INSTRUMENT SET (VATS SURGERY)	GO-7-Dec-2022	1.25 Crores
35.	KIDNEY TRAY	GO-23-Aug-18 Suchi-4	2000 – 2500
36.	LACERATION SET (SURGERY) or SUTURING & SUTURE REMOVAL SET	GO-06-Mar-18 Suchi-3	1 Lacs
37.	LAPAROSCOPIC SURGERY HAND INSTRUMENTS	GO-23-Aug-18 Suchi-4	15 – 18 Lacs
38.	LAPAROSCOPIC SURGERY SET (PEDIATRIC) or ENDOSCOPES (PEDIATRIC LAPAROSCOPY INSTRUMENTS) or ENDOSCOPES (PEDIATRIC LAPAROSCOPY SET)	GO-23-Aug-18 Suchi-4	1.25 Crores
39.	LAPAROSCOPIC SURGERY SYSTEM (HD) or ENDOSCOPY SYSTEM or HD LAPAROSCOPY SET or ENDOVISION SET or LAPAROSCOPIC SET(GENERAL)	GO-23-Aug-18 Suchi-4	90 Lacs
40.	LIGHT SOURCE (XENON TYPE)	GO-23-Aug-18 Suchi-4	3.5 – 4 Lacs
41.	MEDICAL GRADE LAPAROSCOPIC MONITOR	GO-23-Aug-18 Suchi-4	4 – 5 Lacs
42.	MOSQUITO FORCEPS	GO-23-Aug-18 Suchi-4	50,000 – 60,000
43.	NEEDLE HOLDER	GO-23-Aug-18 Suchi-4	70000 – 80000
44.	Basic OT LIGHT (DOUBLE DOME – LED TECHNOLOGY)	GO-7-Dec-2022	8 Lacs
	Advanced OT LIGHT (DOUBLE DOME-LED TECHNOLOGY)		25 – 28 Lacs

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Dr. Vikas Singh  
MS FRACS FRCS FICS FCLC FALS-HPB  
ATLS Course Director  
Professor  
In-charge Unit 3  
Department of General Surgery  
RMLIMS, Lucknow (2019)

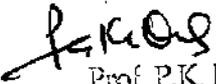
Dr. Anshu Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

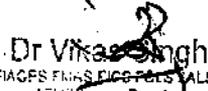
Dr. Brajesh Gupta  
M.S. URO. FRCS, FRACS  
Professor  
Dept. of Surgery  
S.M. Medical College, Agra



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45.	OT LIGHTS (PORTABLE-DOUBLE DOME)	GO-7-Dec-2022	6 Lacs
46.	Basic OT TABLE (MOTORISED) or MOTORISE ELECTRO-HYDROLIC SLIDING TABLE	GO-7-Dec-2022	10 Lacs
	Advanced OT TABLE (MOTORISED) or MOTORISE ELECTRO-HYDROLIC SLIDING TABLE		22 Lacs
47.	PEDIATRIC BASIC INSTRUMENT SET (SURGERY)	GO-06-Mar-18 Suchi-3	8 - 9 Lacs
48.	PEDIATRIC CYSTOSCOPE SET	GO-23-Aug-18 Suchi-4	28 - 30 Lacs
49.	PNEUMATIC TOURNIQUET DIGITAL	GO-7-Dec-2022	40,000 - 50,000
50.	PROCTOSCOPE & GABRIEL SYRINGE	GO-23-Aug-18 Suchi-4	2 Lacs
51.	PUNCH BIOPSY FORCEPS	GO-23-Aug-18 Suchi-4	1 Lacs
52.	RETRACTOR SET or HAND INSTRUMENTS (FOR RETRACTION PROCEDURE)	GO-23-Aug-18 Suchi-4	1.5 - 2 Lacs
53.	SIMS SPECULUM	GO-23-Aug-18 Suchi-4	60,000/-
54.	SURGICAL INSTRUMENTS (ASSORTED MISC INSTRUMENTS FOR MINOR OT) or SURGICAL SMALL INSTRUMENTS SET	GO-28-Dec-17 Suchi-1	3.5 - 4 Lacs
55.	SURGICAL INSTRUMENTS (GENERAL TRAUMA SET)	GO-28-Dec-17 Suchi-1	20 - 22 Lacs
56.	SURGICAL INSTRUMENTS (MISCELLANEOUS)	GO-28-Dec-17 Suchi-1	4.5 - 5 Lacs
57.	SURGICAL WORKSTATION WITH APC or SURGICAL WORKSTATION (HIGH END WITH ALL ACCESSORIES)	GO-7-Dec-2022	1.4 - 1.5 Crores
58.	ULTRASONIC AND VESSEL SEALER DEVICE or ULTRASONIC ENERGY SOURCE or HARMONIC MACHINE WITH VESSEL SEALER	GO-06-Mar-18 Suchi-3	24 - 26 Lacs
59.	VULSELLUM FORCEPS	GO-23-Aug-18 Suchi-4	4,000 - 5,000
60.	WEIGHING MACHINE	GO-23-Aug-18 Suchi-4	2,000 - 2,500

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Vikas Singh  
MS FIAGES, FIAS, FICP, FICS, FALS-HPB  
ATLS Course Director  
Professor  
In charge, Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

  
Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Prashanti Gupta  
M.S., FRIRO, FIAGES, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra



**Declaration Certificate about Technical Specifications  
related to Department of Surgery by committee  
members**

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This is to certify that technical specification of all the above-mentioned machine/instruments, approved by the technical committee is not of any specific company. The technical features of the equipment/instruments from all reputed firms in the current market have been included in this specification to the best of my knowledge and belief & in the opinion of the technical committee.

The technical specification duly signed by the technical committee members is attached herewith.

**Dr. Vikas Singh**  
Professor (JG)  
DR RMLIMS, Lucknow

**Dr. Prashant Kumar Gupta**  
Professor  
Medical College, Agra

**Dr. Rohit Srivastava**  
Professor (JG)  
DR RMLIMS, Lucknow

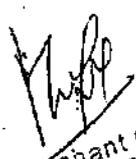
**Prof. P.K. Das**  
Chairman  
Technical specifications committee  
Clinical Subjects & others  
Head, Department of Anesthesiology &  
CCM  
DR RMLIMS, Lucknow

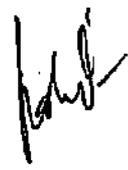
**ALLIS FORCEPS 6 INCHES****Technical specifications**

1. ALLIS TISSUE FORCEPS MEDIUM (5X6) of size 155 MM approx

**Quality specifications**

1. It should be made of high-grade metal
2. It should be of high quality and precision
3. It should be non-magnetic
4. It should have bar coding and should have anti glaring surface for better vision.
5. It should be US FDA / European CE approved

  
 Dr. Prashant Gupta  
 M.S., FIARD, FIMAS, FIAGES  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Lucknow

  
 Dr. Rohit Srivastava  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
 Dr. Vikas Singh  
 MS FIAGES FIMAS FICS FOLS FALS-HPB  
 ATLS Course Director  
 Professor  
 Incharge, Unit 3  
 Department of General Surgery  
 Dr Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

# ALLIS FORCEPS 8 INCHES

## Technical specifications

1. ALLIS TISSUE FORCEPS MEDIUM (5X6) of size 190 MM approx.

## Quality specifications

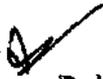
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Dr. Prashant Gupta  
M.S., FIAGES, FMAS, FICGS  
Professor  
Dept. of Surgery  
S.N. Medical College, Lucknow



Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.M.S., Lucknow



Dr Vikas Singh  
MS FIAGES FMAS FICS FCLs FALS-HPB  
ATLS Course Director  
Professor  
Incharge - Unit 3  
Department of General Surgery  
Dr Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)



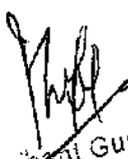
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

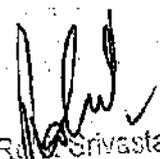
## ARTERY FORCEPS

INSTRUMENT	SPECIFICATION	QTY
ARTERY FORCEPS(CURVED)	LONG 185 mm approx	6
	MEDIUM 140mm approx.	6
	SMALL 125mm approx	6
ARTERY FORCEPS(STRAIGHT)	LONG 185 mm approx	6
	MEDIUM 140mm approx	6
	SMALL 125mm approx	6

### Quality Specifications

1. It should be made of high-grade metal
2. It should be of high quality and precision
3. It should be non-magnetic
4. It should have bar coding and should have anti glaring surface for better vision.
5. It should be US FDA / European CE approved

  
Dr. Prashant Gupta  
M.S., M.D., F.M.S., F.I.C.S., F.I.C.S.  
Professor  
Dept. of Surgery  
S.N. Medical College, Lucknow

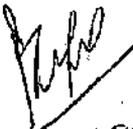
  
Dr. R.M. Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

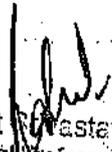
  
Dr. Vikas Singh  
MS, FIAGES, F.M.S., F.I.C.S., F.C.S., F.A.S., H.P.B.  
ATLS Course Director  
Professor  
Incharge - Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## ASSORTED MISC INSTRUMENTS FOR MINOR OT

S. NO.	Name	Specs	Quantity
1	BP handle	3no 125 mm	2
		4 no 125 mm	2
2	Backhaus towel clip	3-1/2"	4
3	Allis forceps	155mm	4
4	Artery forceps		
		185 mm	2
	(curved)	140 mm	6
		125mm	6
5	Artery forceps (straight)	140mm	2
		125mm	2
6	Retractors		
	Czerney's	170-205mm	2
	Langenbeck	210-225 mm	2
	SKIN HOOKS	165 mm	4
7	Sponge holding forceps	225-250mm	1
8	Scissors		
	Metzenbaum (curved)	145 mm	1
	(straight)	175-185 mm	1
	(curved)	175-185 mm	1
	Mayo's (curved)	140 mm	1
9	Non tooth forceps	140-155mm (2-3mm tip)	2
10	Tooth forceps	140-155mm (1x2tooth)	2
11	ADSON FORCEPS	ATRAUMATIC, 145 MM	2
		ATRAUMATIC, 120 MM	2
		ATRAUMATIC, 230 MM	2
12	Babcock Forceps	150-165mm	4
13	Kidney tray	LENGTH 250-265 MM WITH CAPACITY OF 400 ML	1

  
**Dr. Prashant Gupta**  
 M.S., FIUCO, F.MAS, FIAGES  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

  
**Dr. Rohit Wastava**  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
**Dr. Vikas Singh**  
 MS, MCh, FRCR, FICS, FCL, FALS, HPB  
 ATLS Course Director  
 Professor  
 Registrar, Unit 3  
 Department of General Surgery  
 Pt. Bhanwar Lal Institute of Medical Sciences  
 Lucknow (UP)

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. R.M.L.I.M.S., Lucknow

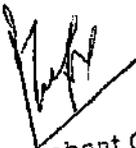
# ASSORTED MISC INSTRUMENTS FOR MINOR OT

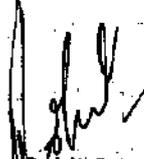
14 Needle holder	LENGTH 150-160 MM	1
	LENGTH 200-210 MM	1
15 TRAY (BIG) with Lid	450mm x 350mm x 80mm	1

NOTE: ALL THE ABOVE MEASUREMENTS ARE APPROXIMATE VALUES

## Quality Specifications

1. It should be made of high-grade metal
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M.S., FIRO, F.M.S., F.I.A.G.S.  
Professor  
Dept. of Surgery  
S.N. Medical College, Aggra

  
Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
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Incharge - Unit 3  
Department of General Surgery  
Dr Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

  
Prof. P.K. Das  
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Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

# BASIC INSTRUMENT SET or SURGICAL INSTRUMENT SET

S. NO	NAME OF INSTRUMENT	SPECIFICATIONS	QUANTITY
1	BP HANDLE	NO 3, 125 MM	3
		NO 4, 135 MM	3
2	BACKHAUS TOWEL CLIP	3-1/2 INCHES (9 CM)	10
3	ALLIS FORCEPS	LONG(5x6) 190mm approx	6
		MEDIUM(5X6) 155 approx	6
4	ARTERY FORCEPS(CURVED)	LONG 185 mm approx	6
		MEDIUM 140mm approx	6
		SMALL 125mm approx	6
5	ARTERY FORCEPS(STRAIGHT)	LONG 185 mm approx	6
		MEDIUM 140mm approx	6
		SMALL 125mm approx	6
6	KOCHER'S FORCEPS	LONG 240mm approx	4
		MEDIUM 200mm approx	4
7	RETRACTOR		
	CZERNY	length 180-205mm approx, blade width 20-25mm, depth 38-45mm	2
	LANGENBACK	length 220-225mm approx, blade width 10-15mm, depth 40-50mm	2
		length 220-225mm approx, blade width 10-15mm, depth 28mm	2
	MORRIS	245 x 70 x 65 mm	2
		245 x 70 x 50 mm	2
		245 x 70 x 540 mm	2
	DEAVER	LARGE=length 290-310mm approx, blade width 75-80mm	2
		MEDIUM=length 290-310mm approx, blade width 50-55mm	2
		SMALL=length 290-310mm approx, blade width 25-30mm	2
	DOYEN'S RETRACTOR	LENGTH 250 MM, BLADE 50 X 85 MM SERRATED, FENESTRATED JAW, STRAIGHT,	1
8	SPONGE HOLDING FORCEPS	LENGTH 225-250 MM	2
9	SCISSORS		
	METZENBAUM	DISSECTING SCISSORS CURVED STANDARD WITH CUTTING EDGE LENGTH(295-305mm)	2
		DISSECTING SCISSORS STRAIGHT STANDARD WITH CUTTING EDGE LENGTH(295-305mm)	1
		DISSECTING SCISSORS CURVED STANDARD WITH CUTTING EDGE LENGTH(175-	2

*Prashant Gupta*  
 Dr. Prashant Gupta  
 M.S., F.M.I.P.O., F.M.A.S., F.I.A.G.E.S.  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

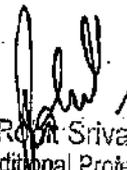
*Rohit Srivastava*  
 Dr. Rohit Srivastava  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

*Vikas Singh*  
 Dr. Vikas Singh  
 M.S., F.M.A.S., F.I.C.S., F.C.S., F.C.L.S., F.A.L.S., M.P.B.  
 ATLS Course Director,  
 Professor  
 Incharge - Unit 3  
 Department of General Surgery  
 Dr. Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)

*P.K. Das*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**BASIC INSTRUMENT SET or SURGICAL INSTRUMENT SET**

	185mm)		
	DISSECTING SCISSORS STRAIGHT DELICATE WITH CUTTING EDGE LENGTH(175- 185mm)		1
MAYO'S	ROUND BLADE, CURVED WITH CUTTING EDGE, LENGTH 155-180 MM)		1
	ROUND BLADE, STRAIGHT WITH CUTTING EDGE, LENGTH 155-180 MM)		1
MULLER RECTAL SCISSORS	S SHAPED, 325 MM		1
10 TISSUE DISSECTING FORCEPS DEBAKEY	LENGTH-240-250mm,1.5-2mm TIP		2
	LENGTH 145-155 MM 2MM TIP		2
	ANGLED 200 MM, 8 INCHES, 40 °, TIP 2MM		2
	350MM, ATRAUMATIC		2
	LONG= LENGTH-240-250mm, 1x2		
TOOTHED STANDARD MODEL	TEETH		2
	MEDIUM=LENGTH-140-155mm, 1x2		
	TEETH		2
NON-TOOTHED STANDARD MODEL	LONG= LENGTH-240-250mm,2-3 MM		
	WIDE TIP		2
	MEDIUM=LENGTH-140-155mm, 2-3 MM		
	WIDE TIP		2
	GRUENWALD 200MM		2
11 MIXTER RIGHT ANGLED FORCEPS	LENGTH 225-245 MM		2
	LENGTH 135-145 MM		2
	LENGTH 290 MM		2
	LENGTH 180 MM		2
12 BABCOCK FORCEPS	LENGTH 150-165 MM		6
	LENGTH 225-235MM		6
13 BOWEL CLAMPS(DOYEN'S) CRUSHING	STRAIGHT-LENGTH-230-240MM		2
	CURVED-LENGTH-230-240MM		2
NON-CRUSHING	STRAIGHT-LENGTH-230-240MM		2
	CURVED-LENGTH-230-240MM		2
MULLER TYPE	375 MM		2
	315 MM X 146 MM		2

  
**Dr. Prashant Gupta**  
 M.S., F.R.C.S., F.M.S., F.I.C.S.  
 Professor  
 Dept. of Surgery  
 S.N. Medical College  
  
**Dr. R.M.L. Srivastava**  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
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 Lucknow (UP)

  
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**BASIC INSTRUMENT SET or SURGICAL INSTRUMENT SET**

PAYR INTESTINAL CLAMP		
KLEINSCHMIDT APPENDECTOMY CLAMP	130 MM	2
SIGMOID ANASTOMOSIS FORCEPS (RIGHT ANGLED)	230 X 80 MM	2
KERSTING SIGMOID ANASTOMOSIS FORCEPS	300 MM	2
14 NEEDLE HOLDER DELICATE PATTERN	LENGTH 150-160 MM	1
	LENGTH 200-210 MM	1
	LENGTH 295-305 MM	1
	LENGTH 175 MM	1
	LENGTH 205 MM	1
	LENGTH 165-185 MM	1
	LENGTH 250-265 MM	1
	LENGTH 290-305 MM	1
HEAVY PATTERN / HEGAR		
15 KIDNEY TRAY		
16 BOWLS	WITH CAPACITY OF 60 ML, 400 ML, 1000 ML & 2500 ML	1 EACH
17 MOYNIHANS FORCEPS	CURVED, LENGTH 5-3/4 INCHES, SERRATED	2
18 GIL WERNET RETRACTOR (FOR RENAL PELVIS)	STANDARD SIZE	1
19 BALFOUR SELF RETAINING ABDOMINAL RETRACTOR	WITH 10" SPREAD, FENESTRATED SIDE BLADES AND CENTRE BLADE OF STANDARD SIZE	1
20 MATHIEU RECTAL SPECULUM	TRIVALVED, 215 MM X 95 MM FOR STERILIZING INSTRUMENTS (WITH PERFORATION) WITH COVER WIDTH 250-300 MM, DEPTH 75-100MM, LENGTH 250-300 MM.	1
21 TRAY	FOR STERILIZING INSTRUMENTS (WITH PERFORATION) WITH COVER WIDTH 250-300 MM, DEPTH 75-100MM, LENGTH 350-400 MM.	1

*[Signature]*  
 Dr. Prashant Gupta  
 M.S. FICRO, FIMAS, FIAGES  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

*[Signature]*  
 Dr. Rohit Srivastava  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.I.M.S., Lucknow

*[Signature]*  
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 ATLS Course Director  
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 Department of General Surgery  
 Dr. Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)

*[Signature]*  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

# BASIC INSTRUMENT SET or SURGICAL INSTRUMENT SET

FOR STERILIZING INSTRUMENTS  
(WITH PERFORATION)  
WITH COVER WIDTH 250-300 MM,  
DEPTH 75-100MM, LENGTH 500-550  
MM

22	DRESSING DRUMS/CONTAINERS WITH LIDS	15 INCHES x 12 INCHES 11 INCHES x 9 INCHES	1 1
23	SINUS FORCEPS	STRAIGHT WITH SERRATED TIPS, LENGTH 7 INCHES	1
24	METALLIC SUCTION CANNULA	7 FR TIP, 7-1/2 INCHES LENGTH APPROX 9 FR TIP, 7-1/2 INCHES LENGTH APPROX	1 1
25	POOL SUMP SUCTION CANNULA WITH OUTER TUBE	225 MM X 10 MM	1
26	SURGICAL TRAY WITH LID	450MMx350MMx80MM APPROX	1
27	TITANIUM LIGATING CLIP APPLIERS	200 MM, ANGLED 25 DEGREE 150 MM, ANGLED 25 DEGREE	2 2
28	YEOMAN RECTAL BIOPSY FORCEPS	420 MM 250 MM	1 1
29	KELLY ANUSCOPE	160 MM X 25 MM	1
30	KELLY PROCTOSCOPE	140 MM X 20 MM	1

NOTE: ALL THE ABOVE MEASUREMENTS ARE APPROXIMATE VALUES

### Quality Specifications

1. It should be made of high-grade metal
2. It should be of high quality and precision
3. It should be non-magnetic
4. It should have bar coding and should have anti glaring surface for better vision.
5. It should be US FDA / European CE approved

  
**Dr. Prashant Gupta**  
 M.D., D.M., DRO, FRCS, FIAGES  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Lucknow  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
**Dr. Vikas Singh**  
 M.S., MCh, FRCS, FICS, FCLSI, FALS-HPB  
 ATLS Course Director  
 Professor  
 Incharge - Unit 3  
 Department of General Surgery  
 Dr Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)

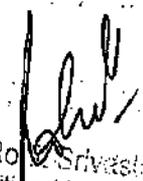
  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

800  
BED PAN

S. NO	SPECIFICATIONS	QTY
1	STAINLESS STEEL BED PAN 14 X 11 X 2.5 INCHES APPROX	1

Quality Specifications

1. It should be made of high-grade metal
2. It should be of high quality and precision.
3. It should be non-magnetic

  
Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.M.S., Lucknow

  
Dr Vikas Singh  
M.D. FRCGS FRCR FICS FCLSI FALS-HPB  
ATLS Course Director  
Professor  
In Charge - Unit 3  
Department of General Surgery  
Dr Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

  
Prof. P.K. Das  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

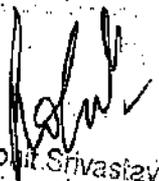
  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**BOWL STERILIZER (LARGE)****Technical Specifications**

Stainless steel Bowl with capacity of 2500 ml approx

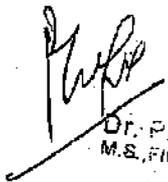
**Quality Specifications**

1. It should be made of high-grade metal
2. It should be of high quality and precision
3. It should be non-magnetic
4. It should have bar coding and should have anti glaring surface for better vision.

  
 Dr. Rohit Srivastava  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
 Dr. Vikas Singh  
 FIAGES FMAS FICS FCLS FALS-HPB  
 ATLS Course Director  
 Professor  
 Incharge - Unit 3  
 Department of General Surgery  
 Dr Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow.

  
 Dr. Prashant Gupta  
 M.S., FIARD, FIACS, FIAGES  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

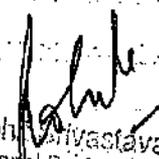
003  
**BOWL STERILIZER (MEDIUM)**

**Technical Specifications**

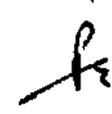
Stainless steel Bowl with capacity of 1000 ml approx

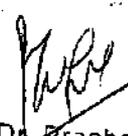
**Quality Specifications**

- 1 It should be made of high-grade metal
- 2 It should be of high quality and precision
- 3 It should be non-magnetic
- 4 It should have bar coding and should have anti glaring surface for better vision.

  
Dr. Rohit Privaastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Vikas Singh  
MS FIAGES FMAS FICS FCLS FALS-HPB  
ATLS Course Director  
Professor  
Incharge Unit 3  
Department of General Surgery  
Dr Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Prashant Gupta  
M.S., FIURO, FMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

# Advanced C-ARM (MOBILE)

## Technical Specifications

(Mobile C- Arm System with Flat Panel Detector)

### 1. Mechanical geometry:

- a) Depth of c arm at least 72 to 75 cm
- b) Vertical movement at least 50 to 55 cm
- c) Oblique/Pivot rotation +/- 210 to 240 deg
- d) Orbital rotation: 180 Deg (-90, +90)
- e) Panning/wig wag: +/- 12 to +/- 14 deg
- f) SID: 95 to 105 cm
- g) Free space with cone: 76 to 78 cm , without cone : 78 to 82 cm
- h) Lowest lateral height: 940 to 1080 mm
- i) Dimensions:

(a) C-Arm: 800 x 1750 x 1540 mm / 307kg ( $\pm 10\%$ )

(b) Monitor: Cart 590 x 690 x 1680 mm / 100kg ( $\pm 10\%$ )

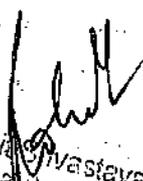
### 2. Generator:

- a) Power at least 4 KW
- b) Max KV: 120 Kv
- c) Max current in Radiography: 40 to 50 mA
- d) Max current in Fluoroscopy: 20 to 25 mA
- e) Both Continuous Fluoro & pulse fluoro should be available.

### 3. X ray tube:

- a) Stationary Anode
- b) Dual focus
- c) Mention Anode capacity
- d) Touch screen console

### 4. Flat panel detector:

  
Dr. Rohini Prastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.I. M.S., Lucknow

  
Dr. Vikas Singh  
MS FRCS FRCS FICS FCL S FALS IPPB  
ATLS Course Director  
Professor  
Incharge Unit 3  
Department of General Surgery  
Dr. Ram Manohar Laxmi Institute of Medical Sciences  
Lucknow - UP

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. R.M.I. Lucknow

  
Dr. Prashant Gupta  
M.S., FRCS, FRCS, FICS, FALS, IPPB  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

007  
**Advanced C-ARM (MOBILE)**

- a) Type: CMOS OR CSI
- b) Field size at least 23x23 cm or more
- c) Maximum resolution (2.8 lp/mm) or better
- d) Frame rate: at least 30 frame/sec
- e) Pixel "1280x1280" or better
- f) Pixel sampling resolution: 16 bits or better
- g) Mention Pixel pitch

5. Collimator:

- a) IRIS /Symmetrical and asymmetrical / Parallel shutter.
- b) Virtual collimator to reduce radiation.

6. Monitor:

- a) LCD/LED monitor with high contrast & brightness of  $\geq 32$ " size installed on a maneuverable trolley

7. Software package:

- a) Post Processing
- b) Windowing
- c) Overview
- d) Zoom
- e) Edge enhancement
- f) BW/WB

8. Digital memory

- a) Storage capacity 25000 images or more

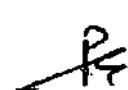
9. Touch screen console at least 10 inch or more rotatable 360 degree.

10. All essential accessories to be provided.

11. Online UPS for complete system with 15 minutes back up should be provided

  
Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery  
Dr. B. J. A. Institute of Medical Sciences

  
Vikas Singh  
MS FIMSGE FMAS FICS FCLS FALS-HPB  
ATLS Course Director  
Professor  
In-charge - Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

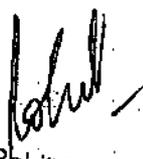
  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Prashant Gupta  
M.S. (SURG), M.A.S., F.I.M.S., F.I.C.S.  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

# Advanced C-ARM (MOBILE)

## Quality Specifications

1. Certifications: Quoted model should have European CE (by a notifying body with four digit identification number) / US FDA certificate.
2. The monitor should be of same make/reputed international brand with US FDA/European CE certification

  
Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery  
Dr. RMLMS, Lucknow

  
Dr. Vikas Singh  
MAGES, FMAS, FICS, FCS, FALS-RPB  
ATLS Course Director  
Professor  
Instructor - Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Prashant Gupta  
M.S., MCh, FMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

# Basic C-ARM (MOBILE)

## Technical Specifications

(Mobile C- Arm System with Flat Panel Detector)

### 1. Mechanical geometry:

- a) Depth of c arm at least 72 to 75 cm
- b) Vertical movement at least 50 to 55 cm
- c) Oblique/Pivot rotation +/- 210 to 240 deg
- d) Orbital rotation: 180 Deg (-90, +90)
- e) Panning/wig wag: +/- 12 to +/- 14 deg
- f) SID: 95 to 105 cm
- g) Free space with cone: 76 to 78 cm , without cone : 78 to 82 cm
- h) Lowest lateral height: 940 to 1080 mm
- i) Dimensions:
  - (a) C-Arm: 800 x 1750 x 1540 mm / 307kg ( $\pm 10\%$ )
  - (b) Monitor: Cart 590 x 690 x 1680 mm / 100kg ( $\pm 10\%$ )

### 2. Generator:

- a) Power at least 4 KW
- b) Max KV: 120 Kv
- c) Max current in Radiography: 40 to 50 mA
- d) Max current in Fluoroscopy: 20 to 25 mA
- e) Both Continuous Fluoro & pulse fluoro should be available.

### 3. X ray tube:

- a) Stationary Anode
- b) Dual focus
- c) Mention Anode capacity
- d) Touch screen console

### 4. Flat panel detector:

  
Dr. Rohit Swastava  
Additional Professor  
Department of General Surgery  
Dr. P.M.

  
Dr. Vikas Singh  
MS FRCGS FRCR FICS FCLSI FALS HPB  
ATLS Course Director  
Professor  
Incharge Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Prashant Gupta  
M.D. (Gen. Surg.) FRCGS FRCR  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

810

## Basic C-ARM (MOBILE)

- a) Type: CMOS OR CSI
- b) Field size at least 23x23 cm or more
- c) Maximum resolution (2.8 lp/mm) or better
- d) Frame rate: at least 30 frame/sec
- e) Pixel "1280x1280" or better
- f) Pixel sampling resolution: 16 bits or better
- g) Mention Pixel pitch

### 5. Collimator:

- a) IRIS /Symmetrical and asymmetrical / Parallel shutter.
- b) Virtual collimator to reduce radiation.

### 6. Monitor:

- a) LCD/LED monitor with high contrast & brightness of  $\geq 32$ " size installed on a maneuverable trolley

### 7. Software package:

- a) Post Processing
- b) Windowing
- c) Overview
- d) Zoom
- e) Edge enhancement
- f) BW/WB

### 8. Digital memory

- a) Storage capacity 25000 images or more

9. Touch screen console at least 10 inch or more rotatable 360 degree.

10. All essential accessories to be provided.

11. Online UPS for complete system with 15 minutes back up should be provided

  
Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery

  
Dr. Vikas Singh  
MS, FIAGES, FMAS, FICS, FCLIS, FALS, HPB  
ATLS Course Director  
Professor  
Incharge - Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

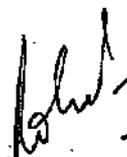
  
Dr. Prashant Gupta  
M.S., FIURO, FMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

811

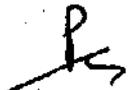
# Basic C-ARM (MOBILE)

## Quality Specifications

1. Certifications: Quoted model should have European CE / US FDA/ BIS certificate.
2. The monitor should be of same make/reputed international brand with US FDA/European CE/BIS certification

  
**Dr. Rohit Srivastava**  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
**Dr. Vikas Singh**  
MS, MCh, FRCR, FICS, FICS, FALS-HPB  
AALS Course Director  
Professor  
Incharge, Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

  
**Prof. P.K. Das**  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

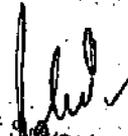
  
**Dr. Prashant Gupta**  
M.S., FIRO, FMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

012

# CAUTERY MACHINE or SURGICAL DIATHERMY MACHINE or ELECTROCAUTERY MACHINE

## Technical Specifications

1. An integrated system with 300 W output generator and a single touch screen for mono polar, bipolar, bipolar saline underwater cut and integrated in one generator.
2. Mobile equipment cart of same make.
3. The equipment should be micro controller based and should adjust the power to get desired surgical effect on the tissue.
4. Spray coagulation voltage of no more than 9000 volts peak-to-peak output with limited capacitive coupling.
5. The system should have monopolar cut & coagulation Mode, two or more bipolar modes all integrated in one system.
6. System compatible with other devices, including:
  - A) Smoke evacuator
  - B) Bipolar current monitor
7. Unit should have touch screen display.
8. Unit should perform self-test during power ON.
9. Unit should have programming facility for different surgeries.
10. Unit should have Digital Wattage Indications for Bipolar, Monopolar Cut and Coagulation.
11. Unit should have isolated monopolar and bipolar outputs.
12. Unit should have Split Type Patient Plate contact monitoring System for Maximum Patient Safety (Unit should not deliver power until and unless Maximum area of the patient plate is covered to completely minimize the risk of post operative H. F. burns)
13. Unit should have Audio Visual Patient plate Error Monitoring System.
14. Unit should Have Facility to use monopolar and bipolar function without Switchover.
15. Unit should have HF leakage monitoring system.
16. Unit should have Time-out Facility to prevent accidental activation
17. Should be compatible with standard advanced resectoscopes
18. Equipment should be provided with
  - A) Reusable patient plate – Adult & Pediatrics with reusable patient plate cable = 10 units

  
Dr. Rohit Swastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Vikas Singh  
M.S., FIAGES, FMAS, FICS, FCLS, FALS, HPB  
ATLS Course Director  
Professor  
Incharge - Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. R.M.L.I.M.S., Lucknow

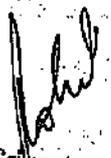
  
Dr. Prashant Gupta  
M.S., FIURO, FMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agartala

**CAUTERY MACHINE or SURGICAL DIATHERMY MACHINE or  
ELECTROCAUTERY MACHINE**

- B) 100 % Washable mono polar two pedal footswitch (for terminal disinfection)-1 no.
- C) 100 % Washable bipolar one pedal 100 % Washable footswitch (for terminal disinfection)-1 no
- D) Reusable Monopolar Electro Surgical Pencil - 5 units
- E) Reusable Bipolar forceps -2 units
- G) Bipolar cord (reusable) - 2 units.
- H) Bipolar cord (disposable) - 10 units

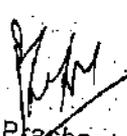
**Quality Specifications**

1. The High-End Electro Surgical Cautery Unit should be supplied along with essential accessories from same Original Equipment Manufacturer.
2. The main unit should be USA FDA approved and with European CE certificate from a notified body having four digit identification number.

  
Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Vikas Singh  
FIAGES FMAS FICS FCIS FALS-HPB  
ATLS Course Director  
Professor,  
Incharge, Unit 3  
Department of General Surgery  
Dr Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

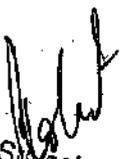
  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

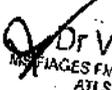
  
Dr. Prashant Gupta  
M.S. F.M.R.O. FMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

# ELECTROSURGICAL UNIT WITH VESSEL SEALER

## Technical Specifications

1. An integrated system with 300 W output generator and a single touch screen for mono polar, bipolar, bipolar saline underwater cut and vessel fusion (RF) integrated in one generator.
2. Mobile equipment cart of same make.
3. The equipment should be micro controller based and should adjust the power to get desired surgical effect on the tissue.
4. Spray coagulation voltage of no more than 9000 volts peak-to-peak output with limited capacitive coupling.
5. The system should have monopolar cut & coagulation Mode, two or more bipolar modes with vessel fusion technology all integrated in one system.
6. System compatible with other devices, including:
  - A) Smoke evacuator
  - B) Bipolar current monitor
7. Unit should have touch screen display.
8. Unit should perform self-test during power ON.
9. Unit should have programming facility for different surgeries.
10. Unit should have Digital Wattage Indications for Bipolar, Monopolar Cut and Coagulation.
11. Unit should have isolated monopolar and bipolar outputs.
12. Unit should have Split Type Patient Plate contact monitoring System for Maximum Patient Safety (Unit should not deliver power until and unless Maximum area of the patient plate is covered to completely minimize the risk of post operative H. F. burns)
13. Unit should have Audio Visual Patient plate Error Monitoring System.
14. Unit should Have Facility to use monopolar and bipolar function without Switchover.
15. Unit should have HF leakage monitoring system.
16. Unit should have Time-out Facility to prevent accidental activation
17. Should be compatible with standard advanced resectoscopes
18. Equipment should be provided with

  
Dr. Rohit S. Astava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.M.S., Lucknow

  
Dr. Vikas Singh  
M.S., FIAGES, FMAS, FICS, FCLS, FALS, HPB  
ATLS Course Director  
Professor  
Incharge - Unit 3  
Department of General Surgery  
Dr. Ram Manohar, Lohia Institute of Medical Sciences  
Lucknow (UP)

  
Dr. Prashant Gupta  
M.S., FIURO, FMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

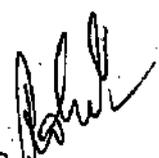
  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## ELECTROSURGICAL UNIT WITH VESSEL SEALER

- A) Reusable patient plate – Adult & Pediatrics with reusable patient plate cable = 10 units
- B) 100 % Washable mono polar two pedal footswitch (for terminal disinfection)-1no.
- C) 100 % Washable bipolar one pedal 100 % Washable footswitch (for terminal disinfection)-1 no
- D) Reusable Monopolar Electro Surgical Pencil - 5 units
- E) Reusable Bipolar forceps -2 units
- F) Washable foot switch for vessel sealer -1 no
- G) Bipolar cord (reusable) – 2 units.
- H) Bipolar cord (disposable) – 10 units
- I) Universal adaptor for attaching several Laparoscopic hand instruments -1no.
- J) Probes for open surgery – 4
- K) Probes for laparoscopic surgery -- 4
- L) The price of probes should be quoted separately as well which will remain freezed for 3 years for future procurement of these probes.

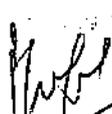
### Quality Specifications

1. The High-End Electro Surgical Cautey Unit with Vessel fusion technology should be supplied along with essential accessories from same Original Equipment Manufacturer.
2. The main unit should be USA FDA approved and with European CE certificate from a notified body having four digit identification numbers.

  
Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery  
Dr. RMLIMS, Lucknow

  
Dr. Vikas Singh  
M.S. FIAGES, FMAS, FICS, FCLS, FALS, MPB  
ATLS Course Director  
Professor  
Incharge - Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Prashant Gupta  
M.S. MCh, FIAGES, FMAS, FICS  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

8-10

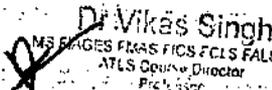
# CHEATLE FORCEPS

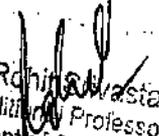
## Technical Specifications

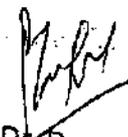
CHEATLE FORCEPS 12 INCHES APPROX

## Quality Specifications

1. It should be made of high-grade metal
2. It should be of high quality and precision
3. It should be non-magnetic
4. It should have bar coding and should have anti glaring surface for better vision.
5. It should be US FDA/EU CE (from a notified body having four digit identification number) certified.

  
**Dr. Vikas Singh**  
MS, FRIGES, FMAS, FICS, FCLIS, FALS, HPB  
ATLS Course Director  
Professor  
Incharge Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lalita Institute of Medical Sciences  
Lucknow (UP)

  
**Dr. Rohit Awastava**  
Additional Professor  
Department of General Surgery  
Dr. R.M.L. M.S., Lucknow

  
**Dr. Prashant Gupta**  
M.S., FIURO, FMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

  
**Prof. P.K. Das**  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

047  
**CIDEX CHAMBER**

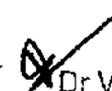
**Technical Specifications**

STAINLESS STEEL CIDEX TRAY OF APPROX SIZE 27"x6"x5" & CAPACITY 10 LITRES APPROX

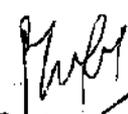
**Quality Specifications**

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2. It should be of high quality and precision
3. It should be non-magnetic
4. It should have bar coding and should have anti glaring surface for better vision.

  
Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.M.S., Lucknow

  
Dr. Vikas Singh  
MS FIAGES FMAS FICS FCLs FALS-HPB  
AFIS Course Director  
Professor  
Incharge - Unit 3  
Department of General Surgery  
Dr. Ram Manohar Laxma Institute of Medical Sciences  
Lucknow (UP)

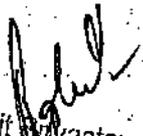
  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Prashant Gupta  
M.S., FJRO, FMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

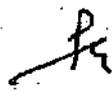
# CUSA EQUIPMENT

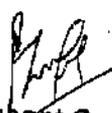
## Technical Specifications

1. The hand piece must be compact and based on magnetostrictive/ Piezoelectric technology with range from 20 KHZ – 30 KHZ frequency.
2. Hand piece should have tip movement/ amplitude ranges from 300 to 360 micron.
3. Tip should have a pre aspiration facility at the end of the tip which helps to remove the heat generated by the rapidly vibrating tip, eliminate the misting that can impair visibility at the surgical site and lubricates and suspends the fragmented tissue to prevent blockage during suction.
4. The system should have expanded selection of hand pieces and surgical tips which allows the surgeon to select the most appropriate combination based on the procedure.
5. The system should be compact provided with the built-in integrated suction facility with vacuum pressure up to 660 mm Hg with protective contamination guard.
6. The system should be based on four major sub systems like fragmentation, cooling, irrigation and aspiration having user-friendly console, color coded tubing for easy set-up of the system.
7. The system must have a feature of controlling the fragmentation rate without reducing the amplitude for different tissue barriers with tactile feedback in the hand piece.
8. The system should have a tissue release function with automatic shutting off after deactivation of the vibration foot switch to prevent against delicate tissue trauma.
9. The hand piece tips should be available for selection from 1.57 mm diameter up to 2.64 mm diameter for all the hand pieces and tips. It should be available for disposable and re-usable/ autoclavable.
10. The hand piece must be compatible with magnetostrictive/piezoelectric technology with built-in water-cooling technology for extended life of the hand piece.
11. Aspiration should not be passed through the hand piece to maintain absolute sterility. Should have independent suction circuit.
12. The hand piece should have a laparoscopic tip (re-usable) about 30 cm in length and autoclavable.
13. The hand piece should have compatibility for laparoscopic tip, easily changeable by the user.
14. The control panel should be rotatable and adjustable display for better visibility in the operation theatre.

  
Dr. Rohit Divastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.M.S. Lucknow

  
Dr. Vikas Singh  
MS, FIAGES, FMAS, FICS, FCLS, FALS, HIPB  
ATLS-Course Director  
Professor  
Incharge - Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Prashant Gupta  
M.S., FIROC, FMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

## CUSA EQUIPMENT

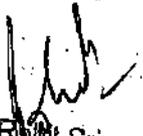
15. The foot switch should have independent control of operation for irrigation, and simultaneous activation for irrigation, fragmentation and suction operation of the hand piece.
16. The system must have a feature of "T issue Select" to differentiate tissue barriers with tactile feedback in the hand piece.
17. Irrigation rate of the system should be in the range of 1 cc/min – 30 cc/min.
18. The hand piece should have detachable electro-surgery unit with universal electro-surgery unit compatibility.
19. The system should be supplied with a sterilization case for complete hand piece along with cables.
20. The system along with all the sub systems should be based on integrated robust mobile cart including suction cannister.

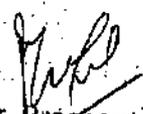
### Quality Specifications

1. The system should be USFDA approved / European CE certified with a notified body having 4-digit identification number.
2. All components should be from the same Original Equipment Manufacturer and in case OEM has collaboration with some manufacturer (for monitor)-then certificate for same to be provided.

  
Dr Vikas Singh  
MS FVAGES FMAS FICS FCLIS FALS-HPD  
ATLS Course Director  
Professor  
Incharge - Unit 3  
Department of General Surgery  
Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. R.M. Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Prashant Gupta  
M.S. FVRO, FMAS, FVAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

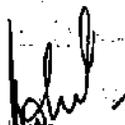
# DRESSING DRUM 9 X 11 INCHES

## Technical Specifications

DRESSING DRUM of size 11 INCHES x 9 INCHES APPROX.

## Quality Specifications

1. It should be made of high-grade metal
2. It should be of high quality and precision
3. It should be non-magnetic
4. It should have bar coding and should have anti glaring surface for better vision.

  
Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery,  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Vikas Singh  
MS FRCS FRCS (CL) CLS FALS-HPD  
ATLS Course Director  
Professor  
Incharge - Unit 3  
Department of General Surgery,  
Dr Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Prashant Gupta  
M.S., FIURO, F.M.S., FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

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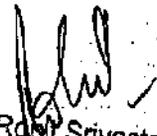
# DRESSING DRUM 12 INCHES

## Technical Specifications

DRESSING DRUM of size 12 INCHES x 9 INCHES APPROX.

## Quality Specifications

1. It should be made of high-grade metal
2. It should be of high quality and precision
3. It should be non-magnetic
4. It should have bar coding and should have anti glaring surface for better vision.

  
Dr. Ravi Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Vikas Singh  
MS F.M.S. F.M.A.S. F.R.C.S. F.C.S. F.A.S. F.H.B.  
ATLS Course Director  
Professor  
Incharge - Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Prashant Gupta  
M.S. F.I.C.R. F.M.A.S. F.I.A.G.S.  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

# DRESSING DRUM 15 X 12 INCHES

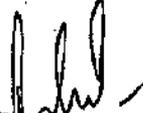
## Technical Specifications

DRESSING DRUM of size 12 INCHES x 9 INCHES

APPROX.

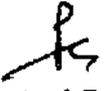
## Quality Specifications

1. It should be made of high-grade metal
2. It should be of high quality and precision
3. It should be non-magnetic
4. It should have bar coding and should have anti glaring surface for better vision.

  
Dr. R.K. Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

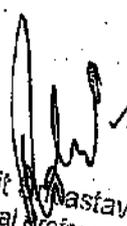
  
Dr. Vikas Singh  
M.S. FIAGES, FMAS, FICS, FOLS, FALS, HPB  
ATLS Course Director  
Professor  
Incharge - Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

  
Dr. Prashant Gupta  
M.S., FIURO, FMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

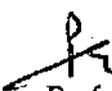
  
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Dept. of Anaesthesiology & CCM  
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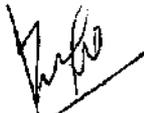
## DRESSING INSTRUMENT SET (SURGERY)

S. No	INSTRUMENTS	QTY
1	MAYO DISSECTING SCISSOR STR 15CM	1
2	METZENBAUM DISS SCISSOR BL/BL STR 18CM	1
3	LITTAUER LIGATURE SCISSOR STR 14CM	1
4	DRESSING FORCEPS STANDARD STR 10.5CM	2
5	TISSUE FORCEPS 1X2T STR 13CM	2
6	FEILCHENFELD SPLINTER FORCEPS STR 9CM	1
7	LISTER SPONGE HOLDING FORCEPS STR 16CM	1
8	KIDNEY BOWL 25CM 3.9CM 0.50L	1
9	SOLUTION BOWL 80X34MM 0.1L	1
10	CYLINDRICAL JAR W/O LID DIAM 5CM 10CM	1
11	METZENBAUM DISS SCISSOR BL/BL CVD 18CM	1
12	DRESSING FORCEPS STANDARD STR 16CM	1
13	TISSUE FORCEPS 1X2T STR 16CM	1
14	CRILE HEMOSTATIC FORCEPS STR 14CM	4
15	CRILE HEMOSTATIC FORCEPS CVD 14CM	4
16	ADSON HEMOSTATIC FORCEPS STR 18.5CM	2
17	PEAN (ROCHESTER) HEMOSTAT FCPS STR 20CM	2
18	PEAN (ROCHESTER) HEMOSTAT FCPS CVD 20CM	2
19	KOCHER HEMOSTATIC FORCEPS 1X2T CVD 15CM	2
20	BACKHAUS TOWEL FORCEPS 10CM	4
21	MAYO-HEGAR NEEDLE HOLDER 16CM	1
22	SCALPEL HANDLE NO 3 STANDARD	1
23	SCALPEL HANDLE NO 4 STANDARD	1
24	FARABEUFR RETRACTOR 15CM	2
25	ALLIS TISSUE FORCEPS 5X6T 19CM	1

  
**Dr. Rohit Mastava**  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.I.

  
**Dr. Vikas Singh**  
 MS, FIAGES, FMAS, FICS, FCLS, FALS, HPB  
 ATLS Course Director  
 Professor  
 Incharge - Unit 3  
 Department of General Surgery  
 Dr. Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
**Dr. Prashant Gupta**  
 M.S., FIURO, FMAS, FIAGES  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

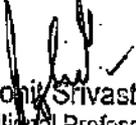
# DRESSING INSTRUMENT SET (SURGERY)

26 STAINLESS STEEL CONTAINER WITH SIDE FILETER WITH HINGES

SIZE; 600X300X260MM 1

## Quality Specifications

1. It should be made of high-grade metal
2. It should be of high quality and precision
3. It should be non-magnetic
4. It should have bar coding and should have anti glaring surface for better vision.
5. It should be US FDA / European CE approved

  
Dr. Ronit Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.M.S., Lucknow

  
Dr. Vikas Singh  
MS, FRCGS, FRCR, FICS, FCL, FALS-HPB  
All IS Courses Director  
Professor  
Incharge - Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

  
Dr. Prashant Gupta  
M.S., FRCR, FRCGS, FRCR  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

# DRUM STERILIZER SET

## Technical Specifications

Dressing drums of sizes(approx.) (one of each each):

240MM X 165MM

240MM X 240MM

279MM X 127MM

290MM X 290MM

355MM X 127MM

340MM X 240MM

381MM X 305MM

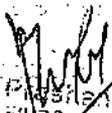
## Quality Specifications

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Dr. Rajiv Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Vikas Singh  
M.D. FIAGES F.M.S. F.M.S. F.C.S. F.A.S. F.H.P.B.  
A.I.L.S. Course Director  
Professor  
In-charge - Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Prashant Gupta  
M.D. F.M.S. F.M.S. F.I.C.S. F.I.C.S.  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

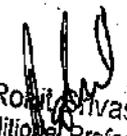
# ENDO STAPLERS

## Technical Specifications

1. LAPAROSCOPIC LINEAR CUTTER LONG SHAFT - WITH/WITHOUT KNIFE ARTICULATING AND 360 DEGREE ROTATING LONG SHAFT LENGTH TO ACCOMMODATE 45 MM & 60 MM RELOAD - 5
2. LAPAROSCOPIC LINEAR CUTTER SHORT SHAFT - WITH/WITHOUT KNIFE ARTICULATING AND 360 DEGREE ROTATING SHORT SHAFT LENGTH TO ACCOMMODATE 45 MM & 60 MM RELOAD - 5
3. CARTRIDGES 60 MM - LAPAROSCOPIC LINEAR CUTTER RELOAD 60 MM (BLUE/GREEN) - 10
4. CARTRIDGES 45 MM - LAPAROSCOPIC LINEAR CUTTER RELOAD 45 MM (BLUE/GREEN) - 10
5. The price of each cartridges should be quoted separately as well which will remain freezed for 3 years for future procurement of these cartridges.

## Quality Specifications

1. Equipment should be USA FDA/ European CE (from a notified body with four-digit identification number) approved.
2. All components should be from same OEM

  
Dr. Rohit Shivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Vikas Singh  
M.S., FIAGES, FRIS, FICS, FOLS, FALS, HPB  
ATLS/ Course Director  
Professor  
Incharge - Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Prashant Gupta  
M.S., FIURO, FMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

# ENDOSCOPES (SEMI RIGID VIDEO THORACOSCOPE) or THORACOSCOPE (SEMI RIGID PLEURAVIDEOSCOPE)

## TECHNICAL SPECIFICATIONS

### Video Thoracoscope:

- Should be of semi rigid type
- Should have High-Definition CCD on tip
- Compatible with electrosurgical and laser treatments
- Distal end & Insertion tube outer diameter should be 7.3 mm or less.
- Distal tip should be bendable in Up/Down direction for better vision in pleural cavity.
- Field of view should be 120 degree or more.
- The angulation range should be Up 160 degrees & Down 130 degrees or better.
- Instrument Channel should be 2.8 mm or better.

### Video Processor & Light Source:

- Should be compatible with analogue, HD-SDI and DVI output & 16:9 & 16:10 output for an HDTV monitor
- It should be the latest, high definition (or better) technology, high end model, compact and ergonomically designed.
- The processor and light source can be integrated or separate
- The light source should be equipped with LED/300 W Xenon lamp
- Equipped With high resolution HDTV imaging capacity (1080 P)
- Provision of Portable memory and USB slot for still image recording
- Should have stand-by/emergency lamp option and provision for lamp switch over from main lamp to stand by lamp in case of main lamp failure

### Monitor:

- 26 Inch (or bigger) LCD medical grade monitor
- Should have multiple display modes such as Picture-in-Picture (PIP) and Picture-out-Picture (POP) display modes
- It should be of same make/ from reputed US FDA/European CE certified international brand

### Accessories:

- Flexible Trocar – 10 pieces
- Single use/Disposable Biopsy Forceps – 10 pieces
- Reusable biopsy forceps – 1 piece
- Suction Valve – 10 pieces
- Biopsy Valves – 10 pieces
- Leakage Tester – 1

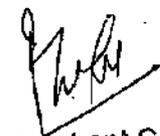
### Trolley:

- A compact, good quality trolley for mounting the Equipment.
- It should be either from the OEM itself or from OEM authorized vendor.

  
Dr. Rohit Swastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Vikas Singh  
MS (FIAGES), MCh (FACS), FICS, FALS, HPB  
AVLS, Member, Director  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCR  
Dr. RMLIMS, Lucknow

  
Dr. Prashant Gupta  
M.S., FIJRO, FMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

## ENDOSCOPES (SEMI RIGID VIDEO THORACOSCOPE) or THORACOSCOPE (SEMI RIGID PLEURAVIDEOSCOPE)

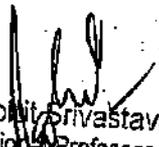
### Recording System:

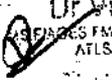
- Software for recording video and images.
- Latest Computer System (RAM – 4 GB, i7 Processor, 1 TB Hard Disk) & UPS.
- Color Laser Printer for Printing Reports.

### 2KVA Isolation Transformer.

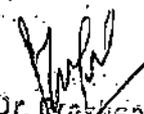
### QUALITY SPECIFICATIONS

1. Should be USA FDA approved and European CE (from a notified body with four digit identification number) certified.

  
Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Vikas Singh  
MS, FIAGES, FMAS, FICS, FCI S, FALS, HPB  
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Department of General Surgery  
Dr Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

  
Prof. P.K. Das  
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Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Wasant Gupta  
M.S., F.M.I.G., FMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

## ENDOSCOPY SYSTEM (ENDOVISION SET)

### TECHNICAL SPECIFICATIONS

#### A. HIGH DEFINITION (HD) CAMERA

- The camera should be 3CCD Full High Definition (1920 X 1080p) resolution.
- Image format should be 16:9/16:10
- Should have a touch screen for control of camera features
- Should have dialog feature between camera and Xenon light source
- Camera should have backward and forward compatibility
- Should have resolution of 1920x1080P with Digital Signal Processing
- Should have connection for keyboard
- Camera should have recording facility both images and video, recording should be in flash drive and videos can be recorded in Full HD formats.
- Camera head should be autoclavable/ etc sterilizable.
- The Camera should have different colour imaging modes.

#### B. LED LIGHT SOURCE

- Light Source should have universal light source cable socket.
- High Power LED providing the highest energy efficiency and light output.
- Should have constant colour temperature over the entire control range.
- Should have colour temperature approx. 6500K.
- Should have LED life time >10000h.
- Power Supply of 100-240V, 50/60Hz.

#### C. HD TELESCOPE 10mm 30° and 0° (ONE EACH)

- Should have diameter of 10mm.
- Should be of 30- and 0-degree view.
- Should have working length of 300mm.
- Should be distortion free and autoclavable

#### D. HD TELESCOPE 5mm 30° and 0° (ONE EACH)

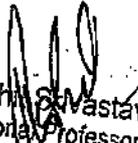
- Should have diameter of 5 mm.
- Should be of 30- and 0-degree view.
- Should have working length of 300mm.
- Should be distortion free and autoclavable

#### E. FIBRE OPTIC LIGHT CABLE

- Should have a diameter of 4.5mm with length of  $\geq 2300$ mm
- Should be flexible and autoclavable.
- Should be Highly Resistant.

#### F. MONITOR Medical Grade

- Should be High Definition (HD) of minimum 26 inches/ 32 inches with wide screen.

  
**Dr. Rohit Srivastava**  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
**Dr. Vikas Singh**  
 MS, FIAGES, FICS, FICLS, FICS, FALS, HPB  
 All India Council Director  
 Professor  
 In-charge - Unit 3  
 Department of General Surgery  
 Dr Ram Manohar Lal Bahadur Institute of Medical Sciences  
 Lucknow (UP)

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
**Dr. Prashant Gupta**  
 MS, FIAGES, FICS, FICLS, FALS, HPB  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

## ENDOSCOPY SYSTEM (ENDOVISION SET)

- It should have LED backlight.
- Should have resolution of minimum 1920x1080
- Medical imaging systems for Minimally Invasive Surgical (MIS) and interventional procedures.
- Should be fully compatible with OR video control applications.
- Should have fastest response time (10-15ms)
- The cooling system for monitor should be Fan-less or heat sink based so that risk for airborne diseases can be minimized.
- It consists of Multi- Modality Image viewing.
- Inputs: HD-SDI, 3G-SDI, DVI, VGA, S-Video, Composite
- Should have low voltage DC power input, 100-240 VAC & 50-60Hz to 24VDC
- Should have Class-I Medical Device Certification; EN-60601-1; CE certificate.

### G. CO2 INSUFFLATOR

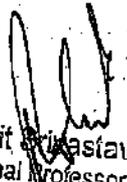
- High flow Insufflator having flow rate 30-45 ltr/min or more.
- Should have automatic pressure and flow control.
- Should have Gas Heating facility.
- Should be able to provide gas flow rates for pediatric patients.
- Should have a touch screen for control of features
- Should have facility of smoke extraction.
- Should have intra-abdominal pressure range of 3-25mm Hg
- Should be supplied with the following accessories:
  - CO2 regulator
  - Insufflation tube having a diameter of 5mm, 2.5mm long.
  - Hygiene filter and sterile pack of 10.
  - Power cable 3m long.

### H. Suction irrigation pump

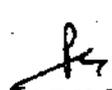
- Should have total fluid consumption 0-3 litres
- Average operation time of pump 2-10 min
- Should have irrigation flow rates 0-2 litres/min
- Should have irrigation pressure 0-750 mm hg
- Should have suction pressure 0-600 mmhg
- Should have reusable tube set, suction canisters and other accessories required should be quoted according for smooth function
- Flow rate of irrigation & suction should be proper/compatible to each other

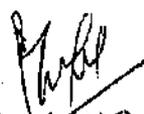
### I. MOBILE EQUIPMENT CART

1. It should be compact and multi-functional
2. It should be of same make/ from OEM authorized vendor.
3. It should be capable of mounting the above-mentioned equipments
4. It should be attached to a mobile roll stand in order to ensure easy maneuverability.
5. It should have inbuilt sockets for electric connections

  
Dr. Rohit K. Astava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Vikas Singh  
MCh, FICGS, FICS, FCLS, FALS, HPB  
ATLS Course Director  
Professor  
In-charge - Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCU  
Dr. RMLIMS, Lucknow

  
Dr. Prashant Gupta  
M.S., FICRO, FMAS, FIAGES  
Professor  
Dept. of Surgery  
M.N. Medical College, Agra

# ENDOSCOPY SYSTEM (ENDOVISION SET)

## QUALITY SPECIFICATIONS

1. Should be USA FDA approved and European CE (from a notified body with four digit identification number) certified.

*[Signature]*  
**Dr. Vikas Singh**  
 MS, FRCS, FRCR, FICS, FCSI, FALS-HPB  
 AILS Course Director  
 Professor  
 Incharge, Unit 3  
 Department of General Surgery  
 Dr. Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)

*[Signature]*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

*[Signature]*  
**Dr. Rohit Srivastava**  
 Additional Professor  
 Department of General Surgery  
 Dr. RMLIMS, Lucknow

*[Signature]*  
**Dr. Prashant Gupta**  
 M.S., FIRO, FMS, FIAGES  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

# ENDOSCOPY SYSTEM (HIGH DEFINITION CAMERA SYSTEM)

## TECHNICAL SPECIFICATIONS

1. The camera should be 3CCD Full High Definition (1920 X 1080p) resolution or better.
2. Image format should be 16:9/16:10
3. Should have a touch screen for control of camera features
4. Should have dialog feature between camera and Xenon light source
5. Camera should have backward and forward compatibility
6. Should have resolution of 1920x1080P with Digital Signal Processing
7. Should have connection for keyboard
8. Camera should have recording facility both images and video, recording should be in flash drive and videos can be recorded in Full HD formats.
9. Camera head should be autoclavable/ eto sterilizable.
10. The Camera should have different colour imaging modes

## QUALITY SPECIFICATIONS

1. Should be USA FDA approved and European CE (from a notified body with four digit identification number) certified.

  
**Dr. Rohit Srivastava**  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
**Dr Vikas Singh**  
 M.S. FIAGES, FRCGS, FRCR, FICLS, FCLIS, FALS-HPB  
 ATLS Course Educator  
 Professor  
 Incharge Unit 3  
 Department of General Surgery  
 Dr. Ram Manohar Laxma Institute of Medical Sciences  
 Lucknow (UP)

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
**Dr. Preshant Gupta**  
 M.S., FRCGS, FRCR, FICLS, FIAGES  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

# ENDOSCOPY SYSTEM (HIGH END 4 K LAPAROSCOPY SYSTEM WITH ICG - NIR)

## TECHNICAL SPECIFICATIONS

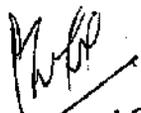
A 4K / Ultra High-Definition laparoscopy system should be of latest model from the company and should consist of the following items:

1. **4K/ Ultra High-Definition Camera System**
  - The system should have native resolution of 3840x2160 pixels or better.
  - Should have NIR-ICG technology for fluorescence guided surgery.
  - It should have touch panel/Keyboard operation for easy control of the system.
  - It should be compatible to 4K recording system.
  - There should be facility of recording the images and video in 4 K format
  - The camera head should provide 4K resolution (3840 x 2160 or better) and compatible with ICG-NIR technology.
  - It should have auto focus function.
  - It should provide electronic zoom function (button controlled)
  - It should be immersible in disinfectant solution and compatible to sterilisation through ETO/ Plasma sterilizer.
  - There should be recording facility (inbuilt/ external) for both images and video, both images and videos should be recorded in 4 K formats. A compatible storage device should be provided with a minimum of 1 TB capacity (If an external recorder is being provided, it should be of same make).
2. **Light source.**
  - It should be 300-watt Xenon lamp or equivalent powerful LED light source
  - Should be compatible with ICG-NIR technology
  - It should automatically adjust light intensity to achieve ideal illumination via camera head buttons.
  - It should have backlight front panel indicators.
  - Should have color temperature of approx. 6000K.
  - Should have LED lifetime >10000h/ Xenon ≥ 500 hrs
  - Should be of same make
3. **4K Medical Grade Monitor –**
  - A Medical Grade monitor of 32" size or more with 4 k resolution (3840 × 2160 pixels or better)
  - Monitor should have 16:9 aspect ratio.
  - It should have multi-modality image display format – rotation image, side by side, picture in picture and picture –out- picture and flip pattern to rotate the image.

  
Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Vikas Singh  
MS, FIAGES, FIMAS, FICS, J. CLS, FALS, HPB  
JALS, Course Director  
Fellowship  
Incharge - Line 3  
Department of General Surgery  
Dr. Ram Mohan Lal Institute of Medical Sciences  
Lucknow (UP)

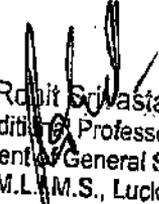
  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Prashant Gupta  
M.S., FIURO, FIMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra



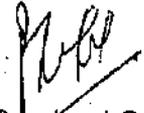
## ENDOSCOPY SYSTEM (HIGH END 4 K LAPAROSCOPY SYSTEM WITH ICG - NIR)

6. Grasping and dissecting forceps, 5-5.5mm, curved left, both jaws opening, "Maryland-Dissector" WL 310 mm comprising: Jaw insert, sheath tube, isolated, handle without locking mechanism, swivelling. Should be Rotatable, dismantlable and autoclavable. -1 No
7. Atraumatic Grasping forceps, 5-5.5mm, both jaws opening, WL 310 mm comprising: Jaw insert, sheath tube isolated, handle without locking mechanism, swivelling. Should be Rotatable, dismantlable and autoclavable. -1 No
8. Babcock Grasping forceps, 5-5.5mm, both jaws opening, WL 310 mm comprising: Jaw insert, sheath tube isolated, handle with locking mechanism, swivelling. Should be Rotatable, dismantlable and autoclavable. -1 No
9. Curved Scissors, 5-5.5mm, curved left, both blades opening, "Metzenbaum", WL 310 mm comprising: Jaw insert, sheath tube isolated, handle without locking mechanism, swivelling. Should be Rotatable, dismantlable and autoclavable. -1 No
10. Hook Scissors, 5-5.5mm, WL 310 mm comprising: Jaw insert, sheath tube isolated, handle without locking mechanism, swivelling. Should be Rotatable, dismantlable and autoclavable. -1 No
11. Universal grasping forceps, 5-5.5mm, both jaws opening, WL 310 mm comprising: jaw insert, sheath tube, isolated, handle with locking mechanism, swivelling. Should be Rotatable, dismantlable and autoclavable. -1 No
12. Hook electrode should have diameter 5-5.5 mm and working length 340 mm. -1 No
13. HF Monopolar Connecting Cable should be approx. 3 m long. -1 No
14. Combination suction and irrigation tube with stop valves, working length should be 300 mm and diameter 5-5.5mm. -1 No
15. Injection Cannula and puncture Cannula should have diameter 5-5.5mm, with 3 mm Lure connector, working length should be 415 mm. -1 No
16. Grasping forceps 2/3 claws, working length should be 335mm and diameter 10-11 mm. -1 No
17. Forceps For retrieval of large portions of tissue should have working length 340mm and diameter 10-11 mm. -1 No
18. Reducing adapter, for reduction from 10-11mm to 5-5.5 mm (both sheath and valve type). -2 No
19. Modular multifunction Needle Holder, size - 5mm WL 310mm-1 No
20. Right angle Needle Holder, size - 5-5.5mm WL 310mm-1 No
21. Bipolar Forceps should be with cable and should be Rotatable, Dismantlable Size -5-5.5mm -1 No
22. Bipolar Forceps with Maryland shape should be with cable and should be Rotatable, Dismantlable Size -5-5.5mm -1 No

  
 Dr. Rohit Srivastava  
 Addl. Professor  
 Department of General Surgery  
 Dr. R.M.L. M.S., Lucknow

  
 Dr. Vikas Singh  
 M.S., F.I.C.S., F.R.C.S., F.A.S., F.R.C.P.  
 ATIS Centre Director  
 Professor  
 Incharge - Unit 3  
 Department of General Surgery  
 Dr. Ram Manohar Laxmi Institute of Medical Sciences  
 Lucknow (UP)

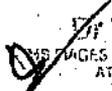
  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & GCM  
 Dr. RMLIMS, Lucknow

  
 Dr. Preshant Gupta  
 M.S., F.I.C.S., F.R.C.S., F.I.C.S.  
 Professor  
 Dept. of Surgery  
 G.M. Medical College, Agra

## ENDOSCOPY SYSTEM (HIGH END 4 K LAPAROSCOPY SYSTEM WITH ICG - NIR)

23. Clip Applicator for medium large (LT-300), ethicon clips. Rotatable, Size 10mm with guide sleeve. -1 No
24. Clip Applicator for medium large (LT-400), ethicon clips. Rotatable, Size 10mm with guide sleeve-1 No
25. Spatula electrode, diam. 5-5.5mm, WL 340 mm-1 No
26. Sterilization tray-1 No
27. 5mm long sleeve reducer 2
28. 5 mm spiral metallic Trocar with cannula - 2
29. 10 mm spiral metallic Trocar with cannula -2
30. 10 to 5 mm reducer adapter compatible - 2
31. DVI / HD-SDI cable of 10 m for connecting second monitor - 1
32. 10 mm suction cannula - 2
33. 1.5mm Universal grasping forceps, pyramidal-shaped teeth and horizontal serrations, 15 mm, double jaw action - 1
34. 2.5mm Universal grasping forceps, pyramidal-shaped teeth and horizontal serrations, 25 mm, double jaw action - 1
35. 3.5mm Grasping and dissecting forceps, fenestrated, fine horizontal serrations, 20 mm long, single jaw action - 1
36. 4.5mm Grasping and dissecting forceps, "Mixer", angled, fine pyramidal-shaped teeth, double jaw action - 1
37. 5.5mm Grasping forceps, "Babcock", large distal grasping surface with fine horizontal serration, double jaw action - 1
38. 6.5mm Atraumatic grasping forceps, jaw hollow with wavy teeth border, 20 mm, double jaw action - 1
39. 7.5mm Micro-scissor, "Metzenbaum", left curved, double jaw action - 1
40. 8. Axial handle - 1
41. 9.5mm Needle holder, straight with carbide insert, single action - 1
42. 10.5mm Needle holder, curved right with carbide insert, single action - 1
43. 11.5mm Needle holder Axially aligned handle with locking mechanism - 1
44. 12. 5.5 mm Long Reducing sleeve - 1
45. Sliding cone (Hassan's port/ connector) 10 mm to fit over trocar sleeves. - 1
46. Replacement sealing caps, pkg of 12 for 5.5 mm trocar sleeves.
47. Spring loaded trocar with pyramidal tip 5 mm along with compatible sleeve - 2  
in no
48. Spring loaded trocar with pyramidal tip 10 mm along with compatible sleeve - 1  
in no

  
**Dr. Rohit Swastava**  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
**Dr. Vikas Singh**  
 M.S. (Gen Surg), F.R.C.S. (Gen Surg), F.I.C.S. (Gen Surg), F.I.P.S. (Gen Surg)  
 ATLS Course Director  
 Professor  
 In Charge - Unit 3  
 Department of General Surgery  
 Dr. Ram Manohar Lal Bahuguna Institute of Medical Sciences  
 Lucknow (UP)

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
**Dr. Prashant Gupta**  
 M.S. (Gen Surg), F.I.C.S. (Gen Surg), F.I.P.S. (Gen Surg)  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agre



## ENDOSCOPY UNIT (LAPAROSCOPIC TROCARS & TELESCOPES)

### TECHNICAL SPECIFICATIONS

#### A. TROCARS

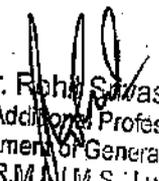
1. Trocar sleeve, with magnetic-ball-valve, metal sleeve straight distal tip, 10 - 11 mm capacity, working length should be 100mm. -2 no
2. Trocar sleeve with magnetic-ball-valve, with insufflation tap, metal sleeve standard, straight distal tip, capacity 5- 5.5 mm, working length should be 100mm.-2 no
3. Trocar with pyramidal tip, capacity 5- 5.5 mm, should have working length 100mm.-2 no
4. Trocar, pyramidal tip, for Trocar sleeves diameter 10-11mm, should have working length 100mm.-2 no
5. Reducing adapter, for reduction from 10-11mm to 5-5.5 mm (both sheath and valve type). -2 No
6. Spring loaded trocar with pyramidal tip 5 mm along with compatible sleeve - 2 in no
7. Spring loaded trocar with pyramidal tip 10 mm along with compatible sleeve - 2 in no
8. Trocar sleeve 12 mm with working length approximately 100 mm - 2 in no
9. Trocar with pyramidal tip for the above 12 mm trocar sleeve. - 2 in no
10. 5 mm spiral metallic Trocar with cannula - 2
11. 10 mm spiral metallic Trocar with cannula - 2

#### B. HD TELESCOPES 10mm 30° and 0° (ONE EACH)

- It should have a diameter of 10mm.
- Should be of 30- and 0-degree view (ONE EACH)
- It should have a working length of 300mm.
- Should be distortion free and autoclavable

#### C. HD TELESCOPES 5mm 30° and 0° (ONE EACH)

- It should have a diameter of 5 mm.

  
Dr. Rohit Swastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.M.S., Lucknow

  
Dr. Vikas Singh  
MD FRACS FRACR FICS FCSI FALS-HPB  
ATLS Course Director  
In-charge, Unit 3  
Department of Visceral Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Prashant Gupta  
M.S., FRCS, FRCR, FRCR, FRCR, FRCR  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra



**ENDOSCOPY UNIT (LOWER GI - HD) or COLONOSCOPE****TECHNICAL SPECIFICATIONS****VIDEO PROCESSOR:**

1. Should be compatible with Analog, HD-SDI and DVI output & 16:9 & 16:10 output for a HDTV monitor should be available.
2. Should contain the long-life LED light source.
3. Equipped with high resolution HDTV-Imaging capacity.
4. Compact, lightweight (10-11 kg) and ergonomically designed Narrow Band Imaging capacity for compatibility with NBI Video scopes.
5. Equipped with one touch connection of scopes.
6. Portable Memory & USB Slot for image recording.
7. Automatic IRIS control & automatic white balance.
8. Equipped with memory back up for settings & Lithium battery.
9. Should have pre freeze function for image stabilization

**VIDEO COLONOSCOPE:**

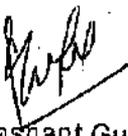
Should have following specifications:

1. Lighter and possess HD resolution image quality.
2. Fully immersible in disinfectant solution.
3. Three or more no. of remote control switches on control body.
4. Compatible with leakage testing device with its airflow and pressure regulation through light source's air pump.
5. Should have capability of Band Imaging (NBI)
6. Others:
  - a. Field of view - 140 degree or more
  - b. Direction of view - 0 degree, forward viewing
  - c. Depth of field - 2 to 100 mm or better
  - d. Distal end outer diameter - 12.8 mm or less
  - e. Insertion tube outer diameter - 12.8 mm or less

  
**Dr. Rohit K. Astava**  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
**Dr. Vikas Singh**  
 MCh, FRCGS, FRCR, FICS, FCL, FALS, HPB  
 ATLS Course Director  
 Professor  
 Incharge, Unit-2  
 Department of General Surgery  
 Dr. Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
**Dr. Prashant Gupta**  
 M.S., FIRO, FMAS, FIAGES  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra



## ENDOSCOPY UNIT (UPPER GI - HD) or VIDEODUODENOSCOPE or ESOPHAGOSCOPE

### TECHNICAL SPECIFICATIONS

#### VIDEO PROCESSOR:

1. Should be compatible with Analog, HD-SDI and DVI output & 16:9 & 16:10 output for a HDTV monitor should be available.
2. Should contain the long-life LED light source.
3. Equipped with high resolution HDTV Imaging capacity.
4. Compact, lightweight (10-11 kg) and ergonomically designed.
5. Narrow Band Imaging capacity for compatibility with NBI Video scopes equipped with one touch connection of scopes.
6. Portable Memory & USB Slot for image recording.
7. Automatic IRIS control & automatic white balance equipped with memory back up for settings & Lithium battery.
8. Should have pre freeze function for image stabilization

#### VIDEO DUODENOSCOPE or ESOPHAGOSCOPE or UPPER GI ENDOSCOPE:

Should have following specifications:

1. Lighter and possess HD resolution image quality.
2. Fully immersible in disinfectant solution.
3. Four or more no. of remote control switches on control body.
4. Compatible with leakage testing device with its airflow and pressure regulation through light source's air pump.
5. Should have capability of Band Imaging (NBI)
6. Others:
  - a. Field of view - 140 degree or more
  - b. Direction of view - 0 degree, forward viewing
  - c. Depth of field - 2 to 100 mm or better
  - d. Distal end outer diameter - 9.2 mm or less
  - e. Insertion tube outer diameter - 9.2 mm or less

  
Dr. Rohit Singh  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.M.S., Lucknow

  
Dr. Vikas Singh  
MS, FIAGES, FIMAS, FICS, FCLS, FALS, HPD  
ATLS Course Director  
Professor  
In-charge - Unit 3  
Department of General Surgery  
Dr. Ram Manohar Laxmi Institute of Medical Sciences  
Lucknow (UP)

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLMS, Lucknow

  
Dr. Prashant Gupta  
M.S., FIAGES, FIMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agre

**ENDOSCOPY UNIT (UPPER GI - HD) or  
VIDEODUODENOSCOPE or ESOPHAGOSCOPE**

- f. Tip bending range - Up 210deg, Down 90deg, Right 100 deg, Left 100 deg
- g. Working length - 1030 mm or more
- h. Channel inner diameter - 2.8 mm or more
- i. Minimum Visible distance of Instrument used thru channel - 3 mm or closer from distal end.

**STANDARD ACCESSORIES**

- a. White cap holder 1
- b. Foot Holder 1
- c. Scope cable holder 1
- d. Keyboard 1
- e. Portable memory (2GB) 1
- f. Keyboard cover 1
- g. Water Container 1
- h. Operation Manual 1
- i. White balance cap 1

**NOTE:**

1. Manufacturer Trolley of same make
2. Monitor- HD Medical Grade 21 inch of same make.
3. Compatible Biopsy forceps.

**QUALITY SPECIFICATIONS**

1. Should be US FDA approved and European CE (from a notified body with four-digit identification number) certified

  
Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Vikas Singh  
MS, FIAGES, FRCGS, FRCR, FRCR(S), FRCR(HPB)  
All India College Director  
Professor  
In Charge, HDG  
Department of Gastroenterology & Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Anant Gupta  
M.S., FRCGS, FRCR, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

**EQUIPMENT TRAY (12 x 10)****Technical Specifications**

TRAY FOR STERILIZING INSTRUMENTS (WITH PERFORATION) WITH COVER  
WIDTH APPROX 12 X 10 INCHES, DEPTH 75-100MM

**Quality Specifications**

1. It should be made of high-grade metal
2. It should be of high quality and precision
3. It should be non-magnetic
4. It should have bar coding and should have anti glaring surface for better vision.



**Dr. Rohit Srivastava**  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow



**Dr Vikas Singh**  
MS FIAGES FMAS FICS FCLIS FALS-HPB  
ATLS Course Director  
Professor  
In charge Unit 3  
Department of General Surgery  
Dr Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)



**Prof. P.K. Das**  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow



**Dr. Prashant Gupta**  
M.S. FIRO, FMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

**EQUIPMENT TRAY (12 x 15)****Technical Specifications**

TRAY FOR STERILIZING INSTRUMENTS (WITH PERFORATION) WITH COVER  
WIDTH APPROX 15 X 12 INCHES, DEPTH 75-100MM

**Quality Specifications**

1. It should be made of high-grade metal
2. It should be of high quality and precision
3. It should be non-magnetic
4. It should have bar coding and should have anti glaring surface for better vision.

  
Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Vikas Singh  
MS, FIAGES, FMAS, FRCSE, FCLIS, FALS-HPB  
AIIS Course Director  
Professor  
Incharge - Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

  
Dr. Prashant Gupta  
M.S., FIURO, FMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

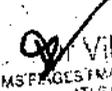
  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

846  
**FORCEPS**

**Technical Specifications**

S. NO	INSTRUMENT	QTY
1.	ALLIS FORCEPS	
	LONG(5x6) 190mm approx	6
	MEDIUM(5X6) 155 approx	6
2.	ARTERY FORCEPS(CURVED)	
	LONG 185 mm approx	6
	MEDIUM 140mm approx	6
	SMALL 125mm approx	6
3.	ARTERY FORCEPS(STRAIGHT)	
	LONG 185 mm approx	6
	MEDIUM 140mm approx	6
	SMALL 125mm approx	6
4.	KOCHER'S FORCEPS	
	LONG 240mm approx	4
	MEDIUM 200mm approx	4
5.	DEBAKEY	
	LENGTH-240-250mm, 1.5-2mm TIP	2
	LENGTGH 145-155 MM 2MM TIP	2
	ANGLED 200 MM, 8 INCHES, 40 °, TIP 2MM	2
	350MM, ATRAUMATIC	2
6.	TOOTHED STANDARD MODEL	
	LONG= LENGTH-240-250mm, 1x2 TEETH	2
	MEDIUM=LENGTH-140-155mm, 1x2 TEETH	2
7.	NON-TOOTHED STANDARD MODEL	
	LONG= LENGTH-240-250mm, 2-3 MM WIDE TIP	2
	MEDIUM=LENGTH-140-155mm, 2-3 MM WIDE TIP	2
	GRUENWALD 200MM	2

Dr. Rohit  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S. Lucknow

  
Vikas Singh  
MS, FRCS, FRCR, FRCR(S), FRCR(Stab), FRCR(HPB)  
ATLS Course Director  
Professor  
In-charge - Unit 3  
Department of General Surgery  
Dr Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Prashant Gupta  
M.S., FIURO, FMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

**FORCEPS****8. BABCOCK FORCEPS**

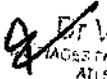
LENGTH 150-165 MM 6

LENGTH 225-235MM 6

**Quality Specifications**

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5. It should be US FDA / European CE approved

  
**Dr. Rohit Singh**  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.M.S., Lucknow

  
**Dr. Vikas Singh**  
 M.D.S. F.M.S. F.I.C.S. CLS FALS-HPB  
 ATLS Certified Director  
 Professor  
 In-charge Unit 3  
 Department of General Surgery  
 Dr. Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
**Dr. Prashant Gupta**  
 M.S. MURC, F.M.S, FIAGES  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

**HEIGHT SCALE****Technical Specifications**

1. Orientation of numerals on the measurement scale: parallel to the board.
2. Unit of measure: centimetres.
3. Smallest graduation: 0.1 cm.
4. Measurement range: Should be able to measure up to 200cm at least
5. Accuracy (+) or (-) 0.1 cm.
6. Large footplate, providing extra stable base and smoothly gliding measuring slide/wedge.

  
 Dr. Rohit Srivastava  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
 Dr. Vikas Singh  
 MD FRCS (P) FRCR FICS FICG FALS-HPB  
 ATLS-Certified Director  
 Registrar  
 Department of General Surgery  
 Dr. Ram Lalachar Laxmi Institute of Medical Sciences  
 Lucknow (UP)

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

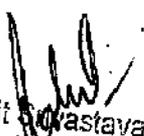
  
 Dr. Prashanti Gupta  
 M.S., FRCS, FRCR, FICS, FIAGES  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

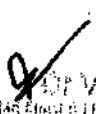
## ICD TRAY

1. BP HANDLE NO 3, 125 MM 2  
NO 4, 135 MM 2
2. BACKHAUS TOWEL CLIP 3-1/2 INCHES (9 CM) 4
3. ARTERY FORCEPS(CURVED) LONG 185 mm approx 2  
MEDIUM 140mm approx 2
4. ARTERY FORCEPS(STRAIGHT) LONG 185 mm approx 2  
MEDIUM 140mm approx 2
5. KOCHER'S FORCEPS LONG 240mm approx 2  
MEDIUM 200mm approx 2
6. MAYO'S SCISSORS ROUND BLADE, CURVED WITH CUTTING EDGE,  
LENGTH 155-180 MM) 1
7. NEEDLE HOLDER HEAVY PATTERN / HEGAR LENGTH 175 MM 1
8. TRAY FOR STERILIZING INSTRUMENTS (WITH PERFORATION) WITH  
COVER WIDTH 250-300 MM, DEPTH 75-100MM, LENGTH 250-300 MM 1
9. TOOTHED TISSUE FORCEPS STANDARD MODEL LONG= LENGTH-240-250mm,  
1x2 TEETH 2  
MEDIUM=LENGTH-140-155mm, 1x2  
TEETH 2

Quality Specifications

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Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.S., Lucknow

  
Dr. Vikas Singh  
IAS (Surgical) - 1984, P.D.S. F.C.S. FALS-HPD  
AIIS, Director  
1984-1985  
Department of General Surgery  
67 Year Member, Lucknow Institute of Medical Sciences  
Lucknow (UP)

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Prashant Gupta  
M.S., F.I.M.S., F.M.S., F.I.A.G.S.  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

## INCISION & DRAINAGE SET (SURGERY)

S. NO.	Name	Specs	Quantity
1	bp handle	3no 125 mm	1
		4 no 125 mm	1
2	backhaus towel clip	3-1/2"	4
4	Artery forceps (curved)	140mm approx 125mm	2 2
7	sponge holding forceps	225-250mm	1
8	scissors metzenbaum (curved)	175-185 mm	1
9	Non toothed forceps	140-155mm(2-3mm tip)	2
10	Toothed forceps	140-155mm(1x2tooth)	2
11	Lister's sinus forceps	straight with serrated tips, length 175 mm	1
12	kidney tray	length 250-265 mm with capacity of 400 ml	1
14	Needle-holder	length 150-160 mm length 200-210 mm	1 1
15	TRAY with Lid	450mm x 350mm x 80mm	1

NOTE: ALL THE ABOVE MEASUREMENTS ARE APPROXIMATE VALUES

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**Dr. Rohit Srivastava**  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
**Dr. Vikas Singh**  
 M.B.B.S. F.M.S. F.I.C.S. F.C.S. F.A.S. H.P.B.  
 ATLS Course Director  
 Professor  
 Department of General Surgery  
 Dr. Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
**Dr. Veerendra Gupta**  
 M.S. F.M.S. F.I.C.S. F.I.G.E.S.  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra



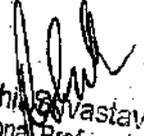


## INSTRUMENT SET (VATS SURGERY)

a)	Must have a resolution of 3840 X 2160 pixels and progressive scan to guarantee a genuine 4K (UHD) picture.	
b)	Must have progressive scan technology.	
c)	The system must have the 4K outputs (12G-SDI and Display Port 1.2).	
2	<b>4K Camera Head with IR/ ICG/ NIR (For 2D Telescopes)</b>	1
a)	Must have a resolution of 3840 X 2160 pixels and progressive scan to guarantee a genuine 4K (UHD) picture.	
b)	The system should have the facility of at least 3x Digital Zoom Lens.	
c)	Must be compatible with all quoted standard Telescopes or ICG/ NIR Telescopes.	
3	<b>True 4K Ultra-High-Definition (UHD) Monitor.</b>	1
a)	Minimum size of 32"	
b)	Must have an effective resolution of 3840 X 2160 Pixels to display pure 4K Images.	
c)	The system must have the 4K outputs and inputs (12G-SDI and Display Port 1.2) to guarantee a genuine 4K (UHD) picture.	
4	<b>Light Source - with ICG / NIR Mode for Fluorescence Assisted Laparoscopic Surgery</b>	1
a)	High Intensity (6000K) Light Source.	1
b)	Must be Xenon 300 Watts or High Intensity LED Light Source with IR/ ICG/ NIR technology.	
c)	2 Nos. Thick Light Cable must be provided	2
5	<b>4K Telescopes (ICG)</b>	
a)	1 Nos. 30 Degree, 10mm Telescope - with ICG/ NIR Mode for Fluorescence Assisted Laparoscopic Surgery	1
6	<b>CO2 Endoflator</b>	1
a)	At Least 40 Liters or above Capacity	
b)	Must have a color touch screen for adjustment of all values and parameters.	
c)	Must have a digital display for all Preset and real-time values.	
d)	Must have an automatic alarm and pressure control system in case of overpressure.	
7	<b>Mobile Video Cart</b>	1
a)	Must be from the same manufacturer/ from OEM authorized vendor.	
b)	Must have a minimum of 2-3 shelves and a drawer.	
c)	Must have Monitor Arm which can be swiveled in all directions.	
d)	Must have an ergonomic design and concealed cable conduits.	

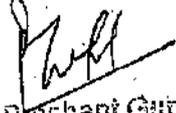
### Quality Specifications

- Should be US FDA approved and European CE (from a notified body with four digit identification number) certified.

  
**Dr. Rohit Swastava**  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
**Dr. Vikas Singh**  
 MCh, FICS, FMS, FICS, FICLS, FALS, HPB  
 ATLS Course Director  
 Professor  
 Incharge Unit 3  
 Department of General Surgery  
 Dr. Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCN  
 Dr. RMLIMS, Lucknow

  
**Dr. Prashant Gupta**  
 M.S., FIRO, FMS, FIAGES  
 Professor  
 Dept. of Surgery  
 Medical College, Agra

**KIDNEY TRAY****Technical Specifications**

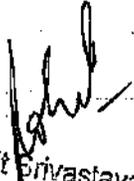
LENGTH 165-185 MM APPROX - 1

LENGTH 250-265 MM APPROX - 1

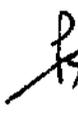
LENGTH 290-305 MM APPROX - 1

**Quality Specifications**

1. It should be made of high-grade metal
2. It should be of high quality and precision
3. It should be non-magnetic
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**Dr. Rohit Privastava**  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.I.

  
**Dr. Vikas Singh**  
 MS FIAGES, FMAS, MCh, FICS, FALS, HFPE  
 ATLS Course Director  
 Professor  
 Invited Lecturer  
 Department of General Surgery  
 Dr. Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
**Dr. Reshant Gupta**  
 MS, MCh, FIAGES, FMAS, FICS  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

## LACERATION SET (SURGERY) or SUTURING & SUTURE REMOVAL SET

S. No	INSTRUMENTS	QTY
1	MAYO DISSECTING SCISSOR STR 14.5CM	1
2	DRESSING FORCEPS STANDARD STR 15CM	1
3	TISSUE FORCEPS 1X2T STR 15CM	1
4	HALSTEAD-MOSQUITO HEMOST FCPS STR 12.5CM	4
5	HALSTEAD-MOSQUITO HEMOST FCPS CVD 12.5CM	4
6	BACKHAUS TOWEL FORCEPS 10CM	4
7	FÖRSTER SPONGE HOLD FCPS SERR STR 18CM	1
8	TC GOLD-GRIP CRILE-WOOD NDHL P04 15CM	1
9	MAYO DISSECTING SCISSOR CVD 14.5CM	1
10	KOCHER HEMOSTATIC FORCEPS 1X2T STR 16CM	2
11	SCALPEL HANDLE NO 3 STANDARD	2
12	ALLIS INTESTINAL FORCEPS 5X6T 15CM	2
13	STAINLESS STEEL CONTAINER SHOULD BE SIDE FILETER WITH HINGES SIZE ; 600X300X260MM	1
14	METZENBAUM DISSECTING SCISSORS CURVED STANDARD WITH CUTTING EDGE  LENGTH (175-185mm)	1

### Quality Specifications

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**Dr. R.M.L. Das**  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.M.S. Lucknow

  
**Dr. Vikas Singh**  
 M.C.B.S. F.M.S. F.I.C.S. F.C.S. F.A.S. H.P.B.  
 ATLS Course Director  
 Professor  
 In-charge Unit 3  
 Department of General Surgery  
 Lucknow Institute of Medical Sciences  
 Lucknow (UP)

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
**Dr. Prashant Gupta**  
 M.S., F.I.I.R.O., F.M.A.S., F.I.A.G.S.  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

## LAPAROSCOPIC SURGERY HAND INSTRUMENTS

### TECHNICAL SPECIFICATIONS

1. Veress Cannula should have working length of 120mm including luer lock connector.  
- 1 no
2. Trocar sleeve, with magnetic-ball-valve, metal sleeve straight distal tip, 10 - 11 mm capacity, working length should be 100mm. -2 no
3. Trocar sleeve with magnetic-ball-valve, with insufflation tap, metal sleeve standard, straight distal tip, capacity 5- 5.5 mm, working length should be 100mm.-2 no
4. Trocar with pyramidal tip, capacity 5- 5.5 mm, should have working length 100mm.-2 no
5. Trocar, pyramidal tip, for Trocar sleeves diameter 10-11mm, should have working length 100mm.-2 no
6. Grasping and dissecting forceps, 5-5.5mm, curved left, both jaws opening, "Maryland-Dissector" WL 310 mm comprising: Jaw insert, sheath tube, isolated, handle without locking mechanism, swiveling. Should be Rotatable, dismantable and autoclavable. -1 No
7. Atraumatic Grasping forceps, 5-5.5mm, both jaws opening, WL 310 mm comprising: Jaw insert, sheath tube isolated, handle without locking mechanism, swiveling. Should be Rotatable, dismantable and autoclavable. -1 No
8. Babcock Grasping forceps, 5-5.5mm, both jaws opening, WL 310 mm comprising: Jaw insert, sheath tube isolated, handle with locking mechanism, swiveling. Should be Rotatable, dismantable and autoclavable. -1 No
9. Curved Scissors, 5-5.5mm, curved left, both blades opening, "Metzenbaum", WL 310 mm comprising: Jaw insert, sheath tube isolated, handle without locking mechanism, swiveling. Should be Rotatable, dismantable and autoclavable. -1 No
10. Hook Scissors, 5-5.5mm, WL 310 mm comprising: Jaw insert, sheath tube isolated, handle without locking mechanism, swiveling. Should be Rotatable, dismantable and autoclavable. -1 No
11. Universal grasping forceps, 5-5.5mm, both jaws opening, WL 310 mm comprising: jaw insert, sheath tube, isolated, handle with locking mechanism, swiveling. Should be Rotatable, dismantable and autoclavable. -1 No
12. Hook electrode should have diameter 5-5.5 mm and working length 340 mm. -1 No
13. HF Monopolar Connecting Cable should be approx 3 m long. -1 No

Dr. Rohit S. Swastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I. Lucknow

Dr. Vikas Singh  
MS, FIAGES, FMAS, FICS, FCLIS, FALS, AIPP  
ATLS Course Director  
Professor  
In-charge - Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

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Professor  
Dept. of Surgery  
S.N. Medical College, Agra

## LAPAROSCOPIC SURGERY HAND INSTRUMENTS

14. Combination suction and irrigation tube with stop valves, working length should be 300 mm and diameter 5-5.5mm. -1 No
15. Injection Cannula and puncture Cannula should have diameter 5-5.5mm, with 3 mm Luer connector, working length should be 415 mm. -1 No
16. Grasping forceps 2/3 claws, working length should be 335mm and diameter 10-11 mm. -1 No
17. Forceps For retrieval of large portions of tissue should have working length 340mm and diameter 10-11 mm. -1 No
18. Reducing adapter, for reduction from 10-11mm to 5-5.5 mm (both sheath and valve type). -2 No
19. Modular multifunction Needle Holder, size – 5mm WL 310mm-1 No
20. Right angle Needle Holder, size – 5-5.5mm WL 310mm-1 No
21. Bipolar Forcep should be with cable and should be Rotatable, Dismantable Size –5-5.5mm -1 No
22. Bipolar Forcep with Maryland shape should be with cable and should be Rotatable, Dismantable Size –5-5.5mm -1 No
23. Clip Applicator for medium large (LT-300), ethicon clips. Rotatable, Size 10mm with guide sleeve. -1 No
24. Clip Applicator for medium large (LT-400), ethicon clips. Rotatable, Size 10mm with guide sleeve-1 No
25. Spatula electrode, diam: 5-5.5mm, WL 340 mm-1 No
26. Sterilization tray-1 No
27. Price of each hand instrument should be quoted separately as well which should be freezed for 3 years for future procurement of these hand instruments.

### QUALITY SPECIFICATIONS

1. Should be USA FDA approved and European CE (from a notified body with four-digit identification number) certified.

Dr. Rohit Swastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

Dr. Vikas Singh  
MS, FIAGES, FRCGS, FICS, FICLS, FALS, FHPB  
ATLS Course Director  
Professor  
Department of General Surgery  
Dr. Ram Manohar Lal Bahuguna Institute of Medical Sciences  
Lucknow (IIP)

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Dr. Prashant Gupta  
M.S., FIURO, FMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

**LAPAROSCOPIC SURGERY SET (PEDIATRIC) or ENDOSCOPES  
(PEDIATRIC LAPAROSCOPY INSTRUMENTS) or ENDOSCOPES  
(PEDIATRIC LAPAROSCOPY SET)**

**TECHNICAL SPECIFICATIONS**

**Part 1 - Instruments Set**

S. No.	Technical Specifications	Qty.
<b>1</b>	<b>Telescopes</b>	
1	Telescope 5mm, 30 Degree, short Length - 25 cms	1
2	Telescope 3.5mm, 0 Degree, short Length - 25 cms	1
3	Telescope 3.5mm, 30-degree, short Length - 25 cms	1
4	Telescope 2mm, 0-degree, short length - 25 cms	1
5	Telescope 2mm, 30-degree, short Length - 25cms	1
6	Autoclavable Cases for Telescopes (Original OEM make)	6
<b>2</b>	<b>Trocars &amp; Obturator</b>	
1	Veress Needle, 10 cms	2
2	Veress Needle, 13 cms	1
3	Trocar, pyramidal tip, with "automatic" flap, for 10mm instruments, length 10 cms [complete set or Associate Accessory]	2
4	Trocar, pyramidal tip, with "automatic" flap, for 5mm instruments, length 10 cms [complete set or Associate Accessory]	4
5	Trocar, pyramidal tip, with "automatic" flap, for 3mm instruments, length 10 cms [complete set or Associate Accessory]	4
6	Trocar, pyramidal tip, with "automatic" flap, for 2mm instruments, length 10 cms [complete set or Associate Accessory]	4
7	Reducer 10mm to 5mm	2
8	Reduction sleeve - 5mm to 3mm	2
9	Sealing caps for 10mm, 5mm, 3mm, 2mm (10pc/pk)	1
<b>3</b>	<b>Hand Instruments (5mm Diameter, 30 Cms working Length - short size)</b>	
	Laparoscopic Hand Instrumens Set (5mm, 30cmc) should have the following features:	
	completely dismantlable 3-piece design for easy cleaning and replacibility.	
	Instrument be 360 degree rotatable	
	should be Insulated with pin for unipolar connection.	
1.	standard jaw maryland dissector.	1
2.	2x4 tooth forceps	1
3.	Allis Forceps - with multiple small teeth	1
4.	Atraumatic-Fenestrated grasping forceps-single action jaw.	1
5.	Long curved jaw Atraumatic-Fenestrated grasping forceps.	1
6.	Matzenbaum curved scissors.	1
7.	Hook scissors	1

Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M., Lucknow

Dr. Vikas Singh  
MS FRCGS FRCS FICS FCLSI FALS-HPB  
AFLS Course Director  
Professor  
In-charge Unit 3  
Department of General Surgery  
Dr Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Dr. Prashant Gupta  
M.B., FRCR, F.M.S., F.I.C.S.  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

**LAPAROSCOPIC SURGERY SET (PEDIATRIC) or ENDOSCOPES  
(PEDIATRIC LAPAROSCOPY INSTRUMENTS) or ENDOSCOPES  
(PEDIATRIC LAPAROSCOPY SET)**

8.	Webcock clamp-Double action jaw	1
9.	L-Hook, 5mm, 36cms	1
10.	Spatula, 5mm, 36cms	1
11.	Unipolar connecting cable	2
12.	Bipolar Maryland-Type Forceps, completely rotatable	1
13.	Bipolar Wide-Jaw forceps, completely rotatable	1
14.	Bipolar connecting cable	2
15.	5mm suction Irrigation tube	1
16.	Needle Holder, 5mm, 36cms. Jaws curved left.	1
17.	Needle Holder, 5mm, 36cms. Jaws curved right.	1
18.	clip Applicator, for LT-300 (medium large) clips	1
19.	Fan Retractor, 5mm	1
20.	Right Angle	1
21.	Biopsy Forceps	1
4	<b>Hand Instruments (3mm Diameter, 20 Cms Working Length)</b>	
	Completely dismantlable 2-piece design for easy cleaning and replacibility	
	Instrument should be easily dismantlable with a touch of a button	
	should be 360 degrees rotatable	
	should be insulated with pin for unipolar connection.	
1	Standard jaw maryland dissector	1
2	2x4 tooth forceps.	1
3	Allis forceps-with multiple small teeth.	1
4	Atraumatic-Fenestrated grasping forceps.	1
5	Long Curved jaw Atraumatic-Fenestrated grasping forceps.	1
6	Matzenbaum curved scissors.	1
7	Pyleoplasty sciccors, with especially long conical jaws	1
8	Hook Scissors.	1
9	L-Hook, 3mm	1
10	3mm suction irrigation tube	1
11	Needle holder, 3mm jaws curved left.	1
12	Needle holder, 3mm jaws curved right.	1
13	Percutaneous Pyloric Spreader, with external fenestration	1
14	Percutaneous pyloric Graspe, extra-long curved jaw	1
15	Bipolar maryland-type forceps, completely rotatable	1
16	Bipolar Wide-Jaw forceps, completely rotatable	1
17	Bipolar Connecting Cable	1
18	Biopsy Forceps	1
19	Right Angled forceps	1
20	Price of each hand instrument should be quoted separately as well which should be freezed for 3 years for future procurement of these hand instruments.	

Dr. Rohit Singh  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M., Lucknow

Dr. Vikas Singh  
MS FRCGS FRCR FICS FCLC FALS-HPB  
ATLS Course Director  
Dr. Professor  
In Charge, Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. R.M.L.I.M., Lucknow

Dr. Prashant Gupta  
MS, FIRO, FRCGS, FRCR  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

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(PEDIATRIC LAPAROSCOPY INSTRUMENTS) or ENDOSCOPES  
(PEDIATRIC LAPAROSCOPY SET)**

**Part 2 – Endo Vision System**

S. No.	Technical Specifications	Qty.
1	<b>True 4K Ultra-High-Definition (UHD) Camera System with IR/ ICG/ NIR</b>	1
a)	Must have a resolution of 3840 X 2160 pixels and guarantee a genuine 4K (UHD) picture.	
b)	Must have progressive scan technology.	
c)	The system must have the 4K outputs (12G-SDI and Display Port 1.2).	
2	<b>4K Camera Head with IR/ ICG/ NIR (For 2D Telescopes)</b>	1
a)	Must have a resolution of 3840 X 2160 pixels and progressive scan to guarantee a genuine 4K (UHD) picture.	
b)	The system should have the facility of at least 3x Digital Zoom Lens.	
c)	Must be compatible with all quoted standard Telescopes or ICG/ NIR Telescopes.	
3	<b>True 4K Ultra-High-Definition (UHD) Monitor</b>	1
a)	Minimum size of 32"	
b)	Must have an effective resolution of 3840 X 2160 Pixels to display pure 4K Images.	
c)	The system must have the 4K outputs and inputs (12G-SDI and Display Port 1.2) to guarantee a genuine 4K (UHD) picture.	
4	<b>Light Source - with ICG / NIR Mode for Fluorescence Assisted Laparoscopic Surgery</b>	1
a)	High Intensity (6000K) Light Source.	1
b)	Must be Xenon 300 Watts or High Intensity LED Light Source with IR/ ICG/ NIR technology.	
c)	2 Nos. Thick Light Cable must be provided.	2
5	<b>4K Telescopes (ICG)</b>	
a)	1 Nos. 30 Degree, 10mm Telescope - with ICG/NIR Mode for Fluorescence Assisted Laparoscopic Surgery	1
6	<b>CO2 Endoflator</b>	1
a)	At Least 30 Liters or above Capacity.	
b)	Must have a color touch screen for adjustment of all values and parameters.	
c)	Must have a digital display for all Preset and real-time values.	
d)	Must have an automatic alarm and pressure control system in case of overpressure.	
7	<b>Mobile Video Cart</b>	1
a)	Must be from the same manufacturer (local alternates not acceptable).	
b)	Must have a minimum of 2-3 shelves and a drawer.	
c)	Must have Monitor Arm which can be swiveled in all directions.	
d)	Must have an ergonomic design and concealed cable conduits.	

Dr. Vikas Singh  
MS FIAGES, FMAS, FICS, FCLS, FALS, HPBS  
ATLS Course Director  
Professor  
Department of Urology  
Dr. Pant Memorial Laxma Institute of Medical Sciences  
Lucknow (U.P.)

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Dr. Prashant Gupta  
MS, FIURO, FMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

**LAPAROSCOPIC SURGERY SET (PEDIATRIC) or ENDOSCOPES  
(PEDIATRIC LAPAROSCOPY INSTRUMENTS) or ENDOSCOPES  
(PEDIATRIC LAPAROSCOPY SET)**

**QUALITY SPECIFICATIONS**

1. Should be USA FDA approved and European CE (from a notified body with four-digit identification number) certified.

*Dr. Vikas Singh*  
MS, FIAGES, FRACS, FICS, FCLS, FALS, MBBCh, FRCR  
ATLS Course Director  
Professor  
In-charge, Unit 3  
Department of General Surgery  
Dr. Raju Manohar Lal Institute of Medical Sciences  
Lucknow (UP)

*Rohit*  
Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.M.S., Lucknow

*Prashant*  
Dr. Prashant Gupta  
M.S., FIURO, FIMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

*P.K. Das*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**LAPAROSCOPIC SURGERY SYSTEM (HD) or ENDOSCOPY SYSTEM or HD LAPAROSCOPY SET or ENDOVISION SET or LAPAROSCOPIC SET(GENERAL)**

**TECHNICAL SPECIFICATIONS**

**A. HIGH DEFINITION (HD) CAMERA**

- The camera should be 3CCD Full High Definition (1920 X 1080p) resolution.
- Image format should be 16:9/16:10
- Should have a touch screen for control of camera features
- Should have dialog feature between camera and Xenon-light source
- Camera should have backward and forward compatibility
- Should have resolution of 1920x1080P with Digital Signal Processing
- Should have connection for keyboard
- Camera should have recording facility both images and video, recording should be in flash drive and videos can be recorded in Full HD formats.
- Camera head should be autoclavable/ eto sterilizable.
- The Camera should have different colour imaging modes.

**B. LED LIGHT SOURCE**

- Light Source should have universal light source cable socket.
- High Power LED providing the highest energy efficiency and light output.
- Should have constant colour temperature over the entire control range.
- Should have colour temperature approx. 6500K.
- Should have LED life time >10000h.
- Power Supply of 100-240V, 50/60Hz.

**C. HD TELESCOPE 10mm 30° and 0° (ONE EACH)**

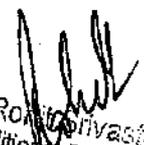
- Should have diameter of 10mm.
- Should be of 30- and 0-degree view.
- Should have working length of 300mm.
- Should be distortion free and autoclavable

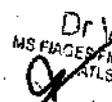
**D. HD TELESCOPE 5mm 30° and 0° (ONE EACH)**

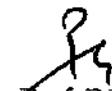
- Should have diameter of 5 mm.
- Should be of 30- and 0-degree view.
- Should have working length of 300mm.
- Should be distortion free and autoclavable

**E. FIBRE OPTIC LIGHT CABLE**

- Should have a diameter of 4.5mm with length of  $\geq 2300$ mm
- Should be flexible and autoclavable.
- Should be Highly Resistant.

  
Dr. R.M.L. Mishra  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.M.S. Lucknow

  
Dr. Vikas Singh  
MS, FIAGES, FMAS, FICS, FCSI, FALS-HPB  
ATLS Course Director  
Professor  
In-charge, Unit 3  
Department of General Surgery  
Dr. Ram Manohar Laxmi Institute of Medical Sciences  
Lucknow (UP)

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Prashant Gupta  
M.S., FIURO, FMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra



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3. It should be capable of mounting the above mentioned equipments
4. It should be attached to a mobile roll stand in order to ensure easy maneuverability.
5. It should have inbuilt sockets for electric connections.

**J. HAND INSTRUMENTS**

1. Veress Cannula should have working length of 120mm including luer lock connector. - 1 no
2. Trocar sleeve, with magnetic-ball-valve, metal sleeve straight distal tip, 10 -11 mm capacity, working length should be 100mm. -2 no
3. Trocar sleeve with magnetic-ball-valve, with insufflation tap, metal sleeve standard, straight distal tip, capacity 5- 5.5 mm, working length should be 100mm.-2 no
4. Trocar with pyramidal tip, capacity 5- 5.5 mm, should have working length 100mm.-2 no
5. Trocar, pyramidal tip, for Trocar sleeves diameter 10-11mm, should have working length 100mm.-2 no
6. Grasping and dissecting forceps, 5-5.5mm, curved left, both jaws opening, "Maryland-Dissector" WL 310 mm comprising: Jaw insert, sheath tube, isolated, handle without locking mechanism, swiveling. Should be Rotatable, dismantable and autoclavable.-1 No
7. Atraumatic Grasping forceps, 5-5.5mm, both jaws opening, WL 310 mm comprising: Jaw insert, sheath tube isolated, handle without locking mechanism, swiveling. Should be Rotatable, dismantable and autoclavable. -1 No
8. Babcock Grasping forceps, 5-5.5mm, both jaws opening, WL 310 mm comprising: Jaw insert, sheath tube isolated, handle with locking mechanism, swiveling. Should be Rotatable, dismantable and autoclavable. -1 No
9. Curved Scissors, 5-5.5mm, curved left, both blades opening, "Metzenbaum", WL 310 mm comprising: Jaw insert, sheath tube isolated, handle without locking mechanism, swiveling. Should be Rotatable, dismantable and autoclavable. -1 No
10. Hook Scissors, 5-5.5mm, WL 310 mm comprising: Jaw insert, sheath tube isolated, handle without locking mechanism, swiveling. Should be Rotatable, dismantable and autoclavable. -1 No
11. Universal grasping forceps, 5-5.5mm, both jaws opening, WL 310 mm comprising: jaw insert, sheath tube, isolated, handle with locking mechanism, swiveling. Should be Rotatable, dismantable and autoclavable. -1 No
12. Hook electrode should have diameter 5-5.5 mm and working length 340 mm.-1 No
13. HF Monopolar Connecting Cable should be approx 3 m long. -1 No
14. Combination suction and irrigation tube with stop valves, working length should be 300 mm and diameter 5-5.5mm: -1 No
15. Injection Cannula and puncture Cannula should have diameter 5-5.5mm, with 3 mm Luer connector, working length should be 415 mm. -1.No
16. Grasping forceps 2/3 claws, working length should be 335mm and diameter 10-11 mm. -1 No

Dr. Vikas Singh

MBBS FRCGS FRCR FICS FCLSI FALS-HPB  
ATLS Course Director  
Professor  
In-charge - Unit 3  
Department of General Surgery  
Dr Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery  
R.M.L.I.M.S.

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Dr. Ashish Gupta  
MBBS, MCh, FRCGS, FRCR  
Professor  
Dept. of Surgery  
R.M.L.I.M.S. Medical College, Agra

**LAPAROSCOPIC SURGERY SYSTEM (HD) or ENDOSCOPY SYSTEM or HD LAPAROSCOPY SET or ENDOVISION SET or LAPAROSCOPIC SET(GENERAL)**

17. Forceps For retrieval of large portions of tissue should have working length 340mm and diameter 10-11 mm. -1 No
18. Reducing adapter, for reduction from 10-11mm to 5-5.5 mm (both sheath and valve type). -2 No
19. Modular multifunction Needle Holder, size – 5mm WL 310mm-1 No
20. Right angle Needle Holder, size – 5-5.5mm WL 310mm-1 No
21. Bipolar Forcep should be with cable and should be Rotatable, Dismantable Size –5-5.5mm -1 No
22. Bipolar Forcep with Maryland shape should be with cable and should be Rotatable, Dismantable Size –5-5.5mm -1-No
23. Clip Applicator for medium large (LT-300), ethicon clips. Rotatable, Size 10mm with guide sleeve. -1 No
24. Clip Applicator for medium large (LT-400), ethicon clips. Rotatable, Size 10mm with guide sleeve-1 No
25. Spatula electrode, diam. 5-5.5mm, WL 340 mm-1 No
26. Sterilization tray-1 No
27. Price of each hand instrument should be quoted separately as well which should be freezed for 3 years for future procurement of these hand instruments.

**K. Should be with C.V.T of 1-KVA**

**QUALITY SPECIFICATIONS**

1. Should be USA FDA approved and European CE (from a notified body with four-digit identification number) certified.

  
**Dr. Rohit Srivastava**  
 Additional Professor  
 Department of General Surgery  
 Dr. R.L.M.S.

  
**Dr Vikas Singh**  
 MD FRCGS FRCR FICS FICS FALS HPB  
 Assoc. Clinical Director  
 Endoscopy  
 Department of Gastroenterology & Hepatology  
 Dr Ram Keshar Lal Institute of Medical Sciences  
 Lucknow (U.P.)

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
**Dr. Praemant Gupta**  
 M.S., SURG, F.MAS, F.I.A.G.S  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

**LIGHT SOURCE (XENON TYPE)****TECHNICAL SPECIFICATIONS**

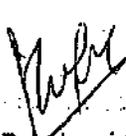
- It should be 300-watt Xenon lamp
- Should be compatible with ICG-NIR technology
- It should automatically adjust light intensity to achieve ideal illumination via camera head buttons.
- It should have backlight front panel indicators.
- Should have colour temperature of approx. 6000K.
- Should have life time  $\geq$  500 hrs

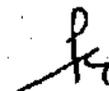
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**Dr. Rohit Srivastava**  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L. Hospital, Lucknow

  
**Dr. Vikas Singh**  
 M.S. (Gen Surg), FICS, FICS, FALS, HPD  
 All India Institute of Medical Sciences  
 Professor  
 Department of General Surgery  
 All India Institute of Medical Sciences  
 Lucknow (UP)

  
**Dr. Poojant Gupta**  
 M.S., FIAB, FMAS, FIAGES  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

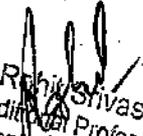
  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**MEDICAL GRADE LAPAROSCOPIC MONITOR****TECHNICAL SPECIFICATIONS**

1. Should be High Definition (HD) of minimum 26" with wide screen.
2. Should be of same make
3. It should have LED backlight.
4. Should have resolution of minimum 1920x1080
5. Should be fully compatible with OR video control applications.
6. It consists of Multi- Modality Image viewing.
7. Inputs: 3G-SDI, DVI, VGA, S-Video, Composite
8. Should have low voltage DC power input, 100-240 VAC & 50-60Hz to 24VDC

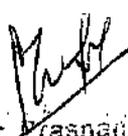
**QUALITY SPECIFICATIONS**

1. Should be USA FDA approved and European CE (from a notified body with four-digit identification number) certified.

  
**Dr. R. N. Shrivastava**  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
**Dr Vikas Singh**  
 MS FIAGES FMAS FICS FCLS FALS JHFD  
 ATLS Course Director  
 Professor  
 Incharge - Unit 3  
 Department of General Surgery  
 Dr Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

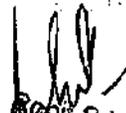
  
**Dr. Prasant Gupta**  
 M.S., FIURO, FMAS, FIAGES  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

**MOSQUITO FORCEPS****Technical Specifications**

- |                              |       |              |   |
|------------------------------|-------|--------------|---|
| 1. ARTERY FORCEPS (CURVED)   | SMALL | 125mm approx | 6 |
| 2. ARTERY FORCEPS (STRAIGHT) | SMALL | 125mm approx | 6 |

**Quality Specifications**

1. It should be made of high-grade metal
2. It should be of high quality and precision
3. It should be non-magnetic
4. It should have bar coding and should have anti glaring surface for better vision.
5. It should be US FDA / European CE approved

  
**Dr. Rohit Srivastava**  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.M.S., Lucknow

  
**Dr Vikas Singh**  
 MS FIAGES FMAS FICS FOLS FALS-HPB  
 ATLS Course Director  
 Professor  
 Incharge - Unit 3  
 Department of General Surgery  
 Dr Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)

  
**Dr. Prashant Gupta**  
 M.S. (SURG), FMAS, FIAGES  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

# NEEDLE HOLDER

## Technical Specifications

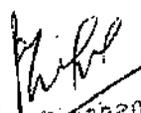
PATTERN	DELICATE	LENGTH 150-160 MM	1
		LENGTH 200-210 MM	
		LENGTH 295-305 MM	
PATTERN / HEGAR	HEAVY	LENGTH 175 MM	1
		LENGTH 205 MM	

## Quality Specifications

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3. It should be non-magnetic
4. It should have bar coding and should have anti glaring surface for better vision.
5. It should be US FDA / European CE approved

  
**Dr. Rishi Srivastava**  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.M.S., Lucknow

  
**Dr. Vikas Singh**  
 MS, MCh, FMS, FICS, FCL, FALS, HPB  
 ATLS Course Director  
 Professor  
 Incharge - Unit 3  
 Department of General Surgery  
 Dr. Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)

  
**Dr. Prashant Gupta**  
 M.S., FJRO, FMS, FIAGES  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCU  
 Dr. RMLMS, Lucknow

**Basic OT LIGHT (DOUBLE DOME – LED TECHNOLOGY)****TECHNICAL SPECIFICATIONS****OT LIGHT**

1. LED OT Light with Double Dome.
2. Dome should have detachable handle that can be sterilized.
3. OT Light should have unrestricted rotation of 360 degree so that light head around its own axis ensures more freedom of movement.
4. Should have control panel for functions at both the light domes:
  - i) On/off
  - ii) Intensity of LED
  - iii) Light field adjustment
5. Light should have low heat generation through cool, infrared-free light
6. Main and satellite light head shouldn't be less than 160,000 Lux light intensity each.
7. Depth of illuminance (L1+L2) should be 80-120 cm or better
8. Colour rendering index (Ra) should be 95 or more
9. Colour temperature range should be 3600k-5000K
10. LED service life should be  $\geq 40000$ Hrs
11. Temperature increase at head area should be  $< 2^{\circ}\text{C}$
12. Dome design should be laminar flow compatible.
13. OT Light Domes should have Screw less Design which will help in cleaning & easy maintenance.
14. OT Light should have Limitless rotation at light head, Limitless rotation at spring arm, should prevent light locking up & with extended range of motion.
15. LED ambient OT light for optimal vision during Minimal Invasive Surgery.
16. Power Consumption should be less than 90 Watt per Dome.
17. OT Light Dome should have Scratch Resistant Glass for durable life.
18. Programmable range of dimming from 10-100% approx, flexible adjustment to surgeon's need.
19. Adjustment of the light values at the light head and at the wall.
20. Should be provided with six additional sets of sterilizable handles.

Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.A.M.S., Lucknow

Dr. Vikas Singh  
MS, FIAGES, FMAS, FICS, FCLIS, FALS, HPB  
ATLS Course Director  
Professor  
Incharge - Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

Dr. P.K. Das  
M.S., D.C.B.S., FIAGES, FICS  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

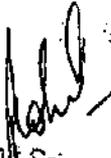
Prof. P.K. Das  
Professor & Head  
Dept. of Anesthesiology & CCM  
Dr. R.M.L.I.A.M.S., Lucknow

**Basic OT LIGHT (DOUBLE DOME – LED TECHNOLOGY)**

21. Should be able to provide natural light.

**QUALITY SPECIFICATIONS**

1. Should be US FDA approved/ European CE (from a notified body with four-digit identification number)/ BIS certified.

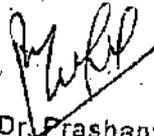


Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

Dr. Vikas Singh  
MS, FIAGES, FMAS, FICS, FCLIS, FALS, HPD  
ATLS Course Director  
Professor  
Incharge - Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)



Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow



Dr. Prashant Gupta  
M.S., FIURO, FMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

# Advanced OT LIGHT (DOUBLE DOME - LED TECHNOLOGY)

## TECHNICAL SPECIFICATIONS

### OT LIGHT

1. LED OT Light with Double Dome.
2. Dome should have detachable handle that can be sterilized.
3. OT Light should have unrestricted rotation of 360 degree so that light head around its own axis ensures more freedom of movement.
4. Should have control panel for functions at both the light domes:
  - i) On/off
  - ii) Intensity of LED
  - iii) Light field adjustment
5. Light should have low heat generation through cool, infrared-free light
6. Main and satellite light head shouldn't be less than 160,000 Lux light intensity each.
7. Depth of illuminance (L1+L2) should be 80-120 cm or better
8. Colour rendering index (Ra) should be 95 or more
9. Colour temperature range should be 3600k-5000K
10. LED service life should be  $\geq 40000$ Hrs
11. Temperature increase at head area should be  $< 2^{\circ}\text{C}$
12. Dome design should be laminar flow compatible.
13. OT Light Domes should have Screw less Design which will help in cleaning & easy maintenance.
14. OT Light should have Limitless rotation at light head, Limitless rotation at spring arm, should prevent light locking up & with extended range of motion.
15. LED ambient OT light for optimal vision during Minimal Invasive Surgery.
16. Power Consumption should be less than 90 Watt per Dome.
17. OT Light Dome should have Scratch Resistant Glass for durable life.
18. Programmable range of dimming from 10-100% approx, flexible adjustment to surgeon's need.
19. Adjustment of the light values at the light head and at the wall.
20. Should be provided with six additional sets of sterilizable handles.

Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

Dr. Vikas Singh  
MS FIAGES, FMAS, FICS, FCLS, FALS-HPB  
RIS Course Director  
Professor  
Incharge - Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Dr. Prashant Gupta  
M.S., FIKO, FMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

## Advanced OT LIGHT (DOUBLE DOME - LED TECHNOLOGY)

21. Should be able to provide natural light.

### Full HD camera system (attachable to the dome)

1. Should be of same make
2. High-resolution Full HD image quality (1080P)
3. Excellent colour reproduction
4. Digital video full HD outputs
5. Backlash-free 360°-rotation of the light is possible with the camera installed
6. Video should be of full HD 1080 (1920 x 1080) resolution
7. Pixels approx 2 million or higher
8. Optical zoom  $\geq 7x$
9. Digital zoom  $\geq 12x$

### Recording Device

1. Should be of reputed international brand
2. The Full-High-Definition Digital Documentation System should be a high-end computer system based on Windows embedded platform (for security purposes) designed specifically for recording, managing, and archiving surgical images and video in native full HD resolution.
3. The captured full high-definition images & videos can be accessed from the hard drive for printing or saving onto multiple forms of external media which includes CD/DVD, USB Flash Drive & Hospital network.
4. It should have at least 1 TB internal Hard Disk Drive (HDD) for in-system archiving. Also, it should have a feature of real time in-procedure DVD burning besides at-the-end procedure DVD burning

### Monitor Arm and Monitor

1. The monitor should be of reputed international brand
2. The monitor should be supplied with and installed on additional Monitor Arm on same suspension as double dome lights.
3. Medical Grade Full HD Monitor of 26 inches

### QUALITY SPECIFICATIONS

1. Should be USA FDA approved and European CE (from a notified body with four-digit identification number) certified.

  
**Dr. Ronit Srivastava**  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
**Dr. Vikas Singh**  
 MS FIAGES, FMAS, FICS, FCL, FALS, HPB  
 ATLS Course Director  
 Professor  
 Incharge - Unit 3  
 Department of General Surgery  
 Dr. Bhanu Manohar Laha Institute of Medical Sciences  
 Lucknow (UP)

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
**Dr. Prashant Gupta**  
 M.S. ENTRO, FMAS, FIAGES  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

**OT LIGHT (PORTABLE - DOUBLE DOME)****TECHNICAL SPECIFICATIONS**

1. LED OT Light with Double Dome.
2. Dome should have detachable handle that can be sterilized.
3. OT Light should have unrestricted rotation of 360 degree so that light head around its own axis ensures more freedom of movement.
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18. Programmable range of dimming from 10-100% approx, flexible adjustment to surgeon's need.
19. Adjustment of the light values at the light head and at the wall.
20. Should be provided with six additional sets of sterilizable handles.
21. Should be able to provide natural light.

Dr. Vikas Singh

MS FIAGES FMAS FICS FCLS FALS-HPB  
 ATLS Course Director  
 Professor  
 Incharge - Unit 3  
 Department of General Surgery  
 Dr Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)

Dr. Rohit Srivastava  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

Prof. P.K. Das  
 Suptg.  
 MS, FIAGES, FMAS, FIAGES  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

# OT LIGHT (PORTABLE - DOUBLE DOME)

## QUALITY SPECIFICATIONS

1. Should be USA FDA approved and European CE (from a notified body with four-digit identification number)/ BIS certified

*[Signature]*  
Dr. Vikas Singh

MS FJGES FMAS FICS FCLIS FALS-HPB  
 ATLS Course Director  
 Professor  
 Incharge - Unit 3  
 Department of General Surgery  
 Dr Ram Manchar Lohia Institute of Medical Sciences  
 Lucknow (UP)

*[Signature]*  
Dr. Shit Srivastava

Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

*[Signature]*

Prof. P.K. Das  
 Professor & Head  
 of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

*[Signature]*  
 Dr. Prashant Gupta  
 M.S., FIRO, FMAS, FJGES  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Lucknow

## Basic OT TABLE (MOTORISED) or MOTORISED ELECTRO - HYDROLIC SLIDING TABLE

### TECHNICAL SPECIFICATIONS

**1. Type of OT Table Actuator:**

Electro-hydraulic

**2. Type of Mechanism for Functioning or Controlling the Table Movements:**

Remote & Table mounted

**3. Remote Controlled Positions:**

Trendelenburg / reverse Trendelenburg, lateral tilt, longitudinal shift, height adjustment, antiflex and flex position and back plate up / down

**4. C-Arm Compatible:**

Yes

**5. Range of Table Top Height:**

650 mm-1000 mm or better

**6. Table Top Longitudinal Sliding, Range:**

5" to 12"

**7. Patient Weight Capacity:**

250 Kgs or higher

**8. Kidney Bridge Required:**

Yes

**9. Split Leg Section, Detachable-1 Pair:**

Yes

**10. Restraint Body Strap-1pair:**

Yes

**11. Remote-1 No:**

Yes

**12. Head Section UP::Down Angle, Range:**

upto 45° to 90° or better

**13. Leg Section UP::Down, Range:**

0° - 90° or better

**Dr. Rohit Singh**  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

**Dr. Vikas Singh**  
MS FIAGES FMAS FICS FCLS FALS-HPB  
ATLS Course Director  
Professor  
Incharge - Unit 3  
Department of General Surgery  
Dr. Ram Manohar Laxma Institute of Medical Sciences  
Lucknow (UP)

*[Signature]*

**Prof. P.K. Das**  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

*[Signature]*  
**Dr. Prashant Gupta**  
M.S. FIAGES, FMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

## Basic OT TABLE (MOTORISED) or MOTORISED ELECTRO - HYDROLIC SLIDING TABLE

### 14. Provision of x ray Cassette Channel:

Yes

### 15. Battery Backup of Operating Table in Hrs:

3 or more than 3 hrs

16. An override control panel should be provided, allowing operation of all movements even when the remote control is not available.

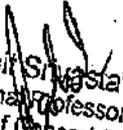
17. The table should be made of High-quality stainless steel and should have provision of Emergency stop along with table unit lock mechanism

### Accessories:

1. Radiolucent Surgical Arm and Hand Table - 1
2. A drainage bowl (for urological procedures) - 1
3. Arm boards (2 in number) with Up, Down & Rotation Function
4. Patient restraint straps (4 in number)
5. Knee crutch stirrups for lithotomy position (2 in number) should be provided as accessory
6. Strap rolls (4 in number) should be provided as accessory
7. Gel pads for bony prominences including head ring
8. Mattress compatible with the table - 2
9. Curtain stand - 1

### QUALITY SPECIFICATIONS

1. Should be USA FDA approved / European CE (from a notified body with four-digit identification number) / BIS certified.

  
Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Vikas Singh  
MS FRCGS FMAS FICS FCIS FALS-HPB  
ATLS Course Director  
Professor  
Incharge - Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

  
Dr. Prashant Gupta  
M.A. FIURO, FMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

## ADVANCED OT TABLE (MOTORISED) or MOTORISED ELECTRO - HYDROLIC SLIDING TABLE

### TECHNICAL SPECIFICATIONS

**1. Type of OT Table Actuator:**

Electro-hydraulic

**2. Type of Mechanism for Functioning or Controlling the Table Movements:**

Remote & Table mounted

**3. Remote Controlled Positions:**

Trendelenburg / reverse Trendelenburg, lateral tilt, longitudinal shift, height adjustment, antiflex and flex position and back plate up / down

**4. C-Arm Compatible:**

Yes

**5. Range of Table Top Height:**

650 mm-1000 mm or better

**6. Table Top Longitudinal Sliding, Range:**

5" to 12"

**7. Patient Weight Capacity:**

250 Kgs or higher

**8. Kidney Bridge Required:**

Yes

**9. Split Leg Section, Detachable-1 Pair:**

Yes

**10. Restraint Body Strap-1pair:**

Yes

**11. Remote-1 No:**

Yes

**12. Head Section UP::Down Angle, Range:**

upto 45° to 90° or better

**13. Leg Section UP::Down, Range:**

0° - 90° or better

Dr. Ronit Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S. Lucknow

Dr. Vikas Singh  
MS, FRCS, FMAS, FICS, FCLIS, FALS-HPB  
ATLS Course Director  
Professor  
Incharge - Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCU  
Dr. RMLIMS, Lucknow

Dr. Prashant Gupta  
M.S., MCh, FRCS, FMAS, FIAGES  
Professor  
Dept. of Surgery  
C.M.S. Medical College, Agra

## OT TABLE (MOTORISED) or MOTORISED ELECTRO - HYDROLIC SLIDING TABLE

### 14. Provision of x ray Cassette Channel:

Yes

### 15. Battery Backup of Operating Table in Hrs:

3 or more than 3 hrs

16. An override control panel should be provided, allowing operation of all movements even when the remote control is not available.

17. The table should be made of High-quality stainless steel and should have provision of Emergency stop along with table unit lock mechanism

### Accessories:

1. Radiolucent Surgical Arm and Hand Table - 1
2. A drainage bowl (for urological procedures) - 1
3. Arm boards (2 in number) with Up, Down & Rotation Function
4. Patient restraint straps (4 in number)
5. Knee crutch stirrups for lithotomy position (2 in number) should be provided as accessory
6. Strap rolls (4 in number) should be provided as accessory
7. Gel pads for bony prominences including head ring
8. Mattress compatible with the table - 2
9. Curtain stand - 1

### QUALITY SPECIFICATIONS

1. Should be USA FDA approved and European CE (from a notified body with four-digit identification number) certified.

*[Signature]*  
Dr. Rakesh Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.M.S., Lucknow

*[Signature]*  
Dr. Vikas Singh  
MS FIAGES FMAS FICS FCIS FALS-HPB  
ATLS Course Director  
Professor  
Incharge - Unit 3  
Department of General Surgery  
Dr Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

*[Signature]*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow.

*[Signature]*  
Dr. Prashant Gupta  
M.S., FIURO, FMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

## PEDIATRIC BASIC INSTRUMENT SET (SURGERY)

S.No	INSTRUMENT	QTY
1	BP HANDLE NO 3 , 125 MM	2
	No 4, 125 MM	2
2	BACKHAUS TOWEL CLIP 3-1/2 INCHES (9 CM)	6
3	BABY ALLIS FORCEPS 130 MM APPROX	4
4	ARTERY FORCEPS(CURVED) 125mm approx	4
	100 MM APPROX	4
5	ARTERY FORCEPS(STRAIGHT) 125mm approx	4
	100 MM APPROX	4
6	KOCHER'S FORCEPS 160 mm approx	4
7	RETRACTOR	
	CZERNY length 175 MM approx, blade width 20-25mm,depth 38-45mm	2
	LANGENBACK length 155 MM APPROX, BLADE WIDTH 20X 6 MM APPROX	2
	LENGTH 210 MM APPROX, BLADE 33 X14 MM APPROX	2
	DEAVER length 215mm approx, blade width 22mm APPROX	2
8	SPONGE HOLDING FORCEPS	
	SERRATED, FENESTRATED JAW, STRAIGHT, LENGTH 180 MM APPROX	2
9	SCISSORS	
	METZENBAUM DISSECTING SCISSORS CURVED DELICATE LENGTH 145 mm APPROX	2
	DISSECTING SCISSORS STRAIGHT DELICATE LENGTH 140mm APPROX	2
	MAYO'S ROUND BLADE, CURVED WITH CUTTING EDGE, LENGTH 140 MM APPROX	2
	ROUND BLADE, STRAIGHT WITH CUTTING EDGE, LENGTH 140 MM APPROX	2
10	TISSUE DISSECTING FORCEPS	

Dr. Rishi Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

Dr. Vikas Singh  
MS, FIAGES, FMAS, FICS, FCLS, FALS-HPB  
ATLS Course Director  
Professor  
Incharge - Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

Dr. Prashant Gupta  
M.S., FIURO, FMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

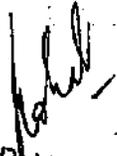
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow



## PEDIATRIC BASIC INSTRUMENT SET (SURGERY)

### Quality Specifications

1. It should be made of high-grade metal
2. It should be of high quality and precision
3. It should be non-magnetic
4. It should have bar coding and should have anti glaring surface for better vision.
5. It should be US FDA / European CE approved



**Dr. Vikas Singh**  
 MS, FIAGES, FMAS, FICS, FCLS, FALS, HPB  
 ATLS Course Director  
 Professor  
 Incharge - Unit 3  
 Department of General Surgery  
 Dr. Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)



**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**Dr. Rohit Srivastava**  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow



**Dr. Prashant Gupta**  
 M.S., M.Ch., FIAGES, FMAS, FICS  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Srma.

## PEDIATRIC CYSTOSCOPE SET

### TECHNICAL SPECIFICATIONS

1. Telescopes
  - a) Miniature compact fibre cysto-urethroscope, 4.5/6Fr for neonates and children, 0 degree, 2.4 instrument channel, Auto clavable Fiber optic light transmission incorporated.
  - b) Miniature compact fibre cysto-urethroscope, 8 fr for neonates and children with 0-degree angle of view fiber telescope, 5fr instrument channel, Autoclavable, Fiber optic light transmission incorporated
  - c) Miniature size straight forward telescope for Neonates cystoscopy, 0-degree, Diameter – 1.2mm, Length -20 cms; Autoclavable fibreoptic telescope transmission incorporated
2. Cystourethroscope Sheath, for examination and irrigation 7fr, 7.5 fr and 8 fr Diameter, with working channel of 4 fr with obturator and 2 Luer Locks for suction irrigation attachment, autoclavable
3. Cytourethroscope Sheath, 8fr and 8.5 fr Diameter, with instrument working channel 4fr and 5fr for Reflux Needles, with obturator and 2 Luer –lock adaptors, autoclavable
4. Paediatric urethrotome Resectoscope Sheath:
  - a) Resectoscope Sheath, 9 fr with obturator with Leur lock stop cock, Connecting Tube with Luer Lock for Irrigation along with compatible working element, attachment facility for unipolar cautery cutting should be by means of spring
  - b) Cystourethroscope Sheath, should be atraumatic, should be no more than 8 fr in size. The sheath should be provided with obturator and 2 Leur connectors
5. Telescope bridge with 1 lockable instrument channel
6. Resectoscope
  - a) Compatible with the above-mentioned urethroscope sheaths
  - b) With movable thumb ring
  - c) Spring loaded action with electrode inside the sheath in rest position
7. Working element set with working element, cutting loop (1 in no) coagulating Electrode (1 in no), high frequency cord (2in no) & protection tube 1 (For Sterilization and storage of electrodes/currettes/knives)
8. Accessories
  - a) Injection Needle Rigid -3 Fr, should be compatible with Cystoscope Sheath
  - b) Hook Electrode – Monopolar, 3 Fr Should be compatible with Cystoscope
  - c) Grasping forceps-Double Action Jaws, Flexible, 3Fr and 4 Fr, Length 28-cms, should be compatible with Cystoscope Sheath
  - d) Knife – Triangular tip, monopolar, 3Fr should be compatible with Cystoscope Sheath

*Dr. Rohit Srivastava*  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

*Dr. Vikas Singh*  
 MS, FIAGES, FMAS, FICS, FCL, FALS, HPB  
 ATLS Course Director  
 Professor  
 Incharge - Unit 3  
 Department of General Surgery  
 Dr. Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)

*Prof. P.K. Das*  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

*Dr. Prashant Gupta*  
 M.S., FICD, FMAS, FIAGES  
 Professor  
 Dept. of Surgery  
 S.M. Medical College, Agra

**PEDIATRIC CYSTOSCOPE SET**

- e) Biopsy forceps- Flexible Double action jaws 3 fr and 4 fr should be compatible with Cystoscope Sheath
  - f) Cutting Loop, angled, should be compatible with Cystoscope Sheath -6in no
  - g) Coagulating Electrode-2.4 fr and 3 fr Monopolar angled and blunt should be compatible with Cystoscope Sheath -6 in no
  - h) Coagulating Electrode- 2.4 fr and 3 fr, Monopolar, hook shaped and with ball end, should be compatible with Cystoscope Sheath -6 in no
  - i) Coagulating Electrode Monopolar high frequency cord
  - j) Cold knives- Round and sickle shaped, should be compatible with Cystoscope Sheath, each 2 in no
9. All working instruments should be compatible with a resectoscope and urethrotome Sheath

*[Signature]*  
**Dr. Vikas Singh**  
 MS, FIAGES, FMAS, FICS, FCLS, FALS, HPB  
 ATLS Course Director  
 Professor  
 Incharge - Unit 3  
 Department of General Surgery  
 Dr. Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)

*[Signature]*  
**Dr. Rishi Srivastava**  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

*[Signature]*  
**Dr. Prashant Gupta**  
 M.S., FIIBO, FMAS, FIAGES  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

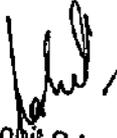
*[Signature]*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**PEDIATRIC CYSTOSCOPE SET**

10. Compatible Plastic Container for Sterilizing and storage, perforated, with transparent lid with inserts for telescope and silicone mat
11. Plastic Container for Sterilizing and storage, perforated with lid for two-level storage, for use with 30 cm and 36 cm instruments, external dimensions (w x d x h) 600 mm x 145 mm x 260mm

**QUALITY SPECIFICATIONS**

1. Should be USA FDA approved and European CE (from a notified body with four-digit identification number) certified.



**Dr. Ronit Srivastava**  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.M.S., Lucknow

**Dr. Vikas Singh**  
MS, FIAGES, FMAS, FICS, FCLS, FALS-HPB  
ATLS Course Director  
Professor  
Incharge - Unit 3,  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences,  
Lucknow (UP)



**Prof. P.K. Das**  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow



**Dr. Prashant Gupta**  
M.S., FIURO, FMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

**PNEUMATIC TOURNIQUET DIGITAL****TECHNICAL SPECIFICATIONS**

1. Ooze free Tourniquet with self calibrating feature
2. Accurate Pressure Monitoring
3. Durable Cuffs
4. Leakage & Corrosion free Cuffs
5. Cuffs should be Auto Clavable and Electromagnetically sealed
6. Maintains the Pressure even after Power failure

*[Signature]*  
**Dr. Rohit Srivastava**  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

*[Signature]*  
**Dr. Vikas Singh**  
 MB BS, DCS, FMS, FICS, FCL, FALS, NPB  
 ATLS Course Director  
 Professor  
 Incharge - Unit 3  
 Department of General Surgery  
 Dr. Bora Memorial Lohia Institute of Medical Sciences  
 Lucknow (UP)

*[Signature]*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

*[Signature]*  
**Dr. Prashant Gupta**  
 M.S., D.I.P.O., F.M.S., F.I.A.G.S  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

## PROCTOSCOPE & GABRIEL SYRINGE

### Technical Specifications

1. Adult:

A) Large: 20-24 mm diameter, about 142 mm length

B) Medium: 20-21 mm diameter, 142 mm length

2. Paediatric: about 17 mm diameter, length about 50 - 64 mm

3. Mathew's Proctoscope (3 bladed): blade length 90-100 mm

4. Gabriel Hemorrhoidal Syringe (10 ml)

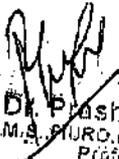
### Quality Specifications

1. It should be made of high-grade metal
2. It should be of high quality and precision
3. It should be non-magnetic
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5. It should be US FDA / European CE approved

  
 Dr. Rohit Srivastava  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
 Dr. Vikas Singh  
 M.S. FIAGES FMAS FICS FCIS FALS-HPB  
 ATLS Course Director  
 Professor  
 Incharge - Unit 3  
 Department of General Surgery  
 Dr. Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Dr. Prashant Gupta  
 M.S. PURO, FMAS, FIAGES  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

**PUNCH BIOPSY FORCEPS****Technical Specifications**

Tischler Cervical Biopsy Punch Forceps of approx. length 8.25 inches

**Quality Specifications**

1. It should be made of high-grade metal
2. It should be of high quality and precision
3. It should be non-magnetic
4. It should have bar coding and should have anti-glaring surface for better vision.
5. It should be US FDA / European CE approved

*[Signature]*  
**Dr. Rohit Srivastava**  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

*[Signature]*  
**Dr. Vikas Singh**  
 MS FIAGES FMAS FICS FCLG FALS-HPB  
 ATLS Course Director  
 Professor  
 Incharge - Unit 3  
 Department of General Surgery  
 Dr. Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)

*[Signature]*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

*[Signature]*  
**Dr. Prashant Gupta**  
 M.S. FIARO FMAS FIAGES  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

## RETRACTOR SET or HAND INSTRUMENTS (FOR RETRACTION PROCEDURE)

### Technical Specifications

1. CZERNY  
length 180-205mm approx, blade width 20-25mm, depth 38-45mm 2
2. LANGENBACK
  - a) length 220-225mm approx, blade width 10-15mm, depth 40-50mm 2
  - b) length 220-225mm approx, blade width 10-15mm, depth 28mm 2
3. MORRIS
  - a) 245 x 70 x 65 mm 2
  - b) 245 x 70 x 50 mm 2
  - c) 245 x 70 x 540 mm 2
4. DEEVER
  - a) LARGE=length 290-310mm approx, blade width 75-80mm 2
  - b) MEDIUM=length 290-310mm approx, blade width 50-55mm 2
  - c) SMALL=length 290-310mm approx, blade width 25-30mm 2

### DOYEN'S RETRACTOR

LENGTH 250 MM, BLADE 50 X 85 MM 1

### Quality Specifications

1. It should be made of high-grade metal
2. It should be of high quality and precision
3. It should be non-magnetic
4. It should have bar coding and should have anti glaring surface for better vision.
5. It should be US FDA / European CE approved

Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

Dr. Vikas Singh  
MS, FIAGES, FMAS, FICS, FCLS, FALS, HPB  
ATLS Course Director  
Professor  
Incharge - Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Dr. Ashant Gupta  
M.S., MCh, FIAGES, FMAS, FICGS  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

**SIMS SPECULUM****Technical Specifications**

SIMS VAGINAL SPECULUM OF SIZES:

BLADE SIZE (APPROX MM)	LENGTH (APPROX INCHES)
70 X 26/ 75 X 30	5
75 X 30/ 80 X 35	6
80 X 35/ 90 X 40	7

**Quality Specifications**

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3. It should be non-magnetic
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**Dr. Rohit Privastava**  
 Additional Professor  
 Department of General Surgery

  
**Dr. Vikas Singh**  
 M.B.B.S., F.M.S., F.I.C.S., F.C.S., F.A.S., F.H.P.S.  
 ATLS Course Director  
 Professor  
 Incharge - Unit 3  
 Department of General Surgery  
 Dr. Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
**Dr. Prashant Gupta**  
 M.S., F.I.R.O., F.M.S., F.I.A.G.S.  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

**SURGICAL INSTRUMENTS (ASSORTED MISC  
INSTRUMENTS FOR MINOR OT) or SURGICAL SMALL  
INSTRUMENTS SET**

891

S. NO.	Name	Specs	Quantity
1	BP handle	3no 125 mm	2
		4 no 125 mm	2
2	Backhaus towel clip	3-1/2"	4
3	Allis forceps	155mm	4
4	Artery forceps	185 mm	2
	(curved)	140 mm	6
		125mm	6
5	Artery forceps (straight)	140mm	2
		125mm	2
6	Retractors		
	Czerney's	170-205mm	2
	Langenbeck	210-225 mm	2
	SKIN HOOKS	165 mm	4
7	Sponge holding forceps	225-250mm	1
8	Scissors		
	Metzenbaum (curved)	145 mm	1
	(straight)	175-185 mm	1
	(curved)	175-185 mm	1
	Mayo's (curved)	140 mm	1
9	Non tooth forceps	140-155mm (2-3mm tip)	2
10	Tooth forceps	140-155mm (1x2tooth)	2
11	ADSON FORCEPS	ATRAUMATIC, 145 MM	2
		ATRAUMATIC, 120 MM	2
		ATRAUMATIC, 230 MM	2
12	Babcock Forceps	150-165mm	4
13	Kidney tray	LENGTH 250-265 MM WITH CAPACITY OF 400 ML	1

**Dr. Vikas Singh**  
 M.S., F.I.A.S., F.I.C.S., F.R.S., F.R.C.S.  
 F.I.S. (Gen. Surg.)  
 F.I.S. (Colo. Rect.)  
 F.I.S. (Uro.)  
 F.I.S. (Gynae.)  
 F.I.S. (Paed.)  
 F.I.S. (Plast.)  
 F.I.S. (Dermat.)  
 F.I.S. (Otolaryngol.)  
 F.I.S. (Ophthalmol.)  
 F.I.S. (Neurology)  
 F.I.S. (Neurosurg.)  
 F.I.S. (Radiology)  
 F.I.S. (Pathology)  
 F.I.S. (Microbiology)  
 F.I.S. (Immunology)  
 F.I.S. (Allergy)  
 F.I.S. (Nephrology)  
 F.I.S. (Hepatology)  
 F.I.S. (Gastroenterology)  
 F.I.S. (Endocrinology)  
 F.I.S. (Diabetology)  
 F.I.S. (Geriatrics)  
 F.I.S. (Palliative Care)  
 F.I.S. (Pain Management)  
 F.I.S. (Intensive Care)  
 F.I.S. (Critical Care)  
 F.I.S. (Perfusion)  
 F.I.S. (Anesthesiology)  
 F.I.S. (Sedation)  
 F.I.S. (Respiratory)  
 F.I.S. (Cardiology)  
 F.I.S. (Cardiothoracic)  
 F.I.S. (Vascular)  
 F.I.S. (Transplant)  
 F.I.S. (Organ Transplant)  
 F.I.S. (Cell Transplant)  
 F.I.S. (Stem Cell)  
 F.I.S. (Gene Therapy)  
 F.I.S. (Immunotherapy)  
 F.I.S. (Cancer Therapy)  
 F.I.S. (Radiotherapy)  
 F.I.S. (Oncology)  
 F.I.S. (Hematology)  
 F.I.S. (Oncoplastic)  
 F.I.S. (Reconstructive)  
 F.I.S. (Maxillofacial)  
 F.I.S. (Craniofacial)  
 F.I.S. (Neuroplastic)  
 F.I.S. (Spinal)  
 F.I.S. (Orthopedic)  
 F.I.S. (Trauma)  
 F.I.S. (Burns)  
 F.I.S. (Hand)  
 F.I.S. (Foot)  
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**Dr. Rohit Srivastava**  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.M.S., Lucknow

**Dr. Ashant Gupta**  
 M.S., F.I.C.S., F.I.A.S., F.I.C.S.  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCU  
 Dr. RMLIMS, Lucknow

**SURGICAL INSTRUMENTS (ASSORTED MISC INSTRUMENTS FOR MINOR OT) or SURGICAL SMALL INSTRUMENTS SET**

892

14	Needle holder	LENGTH 150-160 MM	1
		LENGTH 200-210 MM	1
15	TRAY (BIG) with Lid	450mm x 350mm x 80mm	1

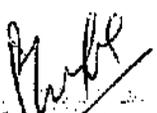
NOTE: ALL THE ABOVE MEASUREMENTS ARE APPROXIMATE VALUES

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**Dr. Rohit Srivastava**  
Additional Professor  
Department of General Surgery  
Dr. RMLIMS, Lucknow

  
**Dr. Vikas Singh**  
M.S. FRCGS, FRCR, FICS, FCL, FALS, HPB  
MIS Course Director  
Professor  
Incharge - Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

  
**Dr. Prashant Gupta**  
M.S., MCh, FIRO, FRCR, FRCGS  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

  
**Prof. P.K. Das**  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## SURGICAL INSTRUMENTS (GENERAL TRAUMA SET)

S.	NAME OF INSTRUMENT	SPECIFICATIONS	QUANTITY
NO			
1	BP HANDLE	NO 3, 125 MM	3
		NO 4, 135 MM	3
2	BACKHAUS TOWEL CLIP	3-1/2 INCHES (9 CM)	10
3	ALLIS FORCEPS	LONG(5x6) 190mm approx	6
		MEDIUM(5X6) 155 approx	6
4	ARTERY FORCEPS(CURVED)	LONG 185 mm approx	6
		MEDIUM 140mm approx	6
		SMALL 125mm approx	6
5	ARTERY FORCEPS(STRAIGHT)	LONG 185 mm approx	6
		MEDIUM 140mm approx	6
		SMALL 125mm approx	6
6	KOCHER'S FORCEPS	LONG 240mm approx	4
		MEDIUM 200mm approx	4
7	RETRACTOR		
	CZERNY	length 180-205mm approx, blade width 20-25mm,depth 38-45mm	2
	LANGENBACK	length 220-225mm approx, blade width 10-15mm,depth 40-50mm	2
		length 220-225mm approx, blade width 10-15mm,depth 28mm	2
	MORRIS	245 x 70 x 65 mm	2
		245 x 70 x 50 mm	2
		245 x 70 x 540 mm	2
	DEAVER	LARGE=length 290-310mm approx, blade width 75-80mm	2
		MEDIUM=length 290-310mm approx, blade width 50-55mm	2
		SMALL=length 290-310mm approx, blade width 25-30mm	2
	DOYEN'S RETRACTOR	LENGTH 250 MM, BLADE 50 X 85 MM SERRATED, FENESTRATED JAW,	1
8	SPONGE HOLDING FORCEPS	STRAIGHT, LENGTH 225-250 MM	2
9	SCISSORS		
	METZENBAUM	DISSECTING SCISSORS CURVED STANDARD WITH CUTTING EDGE LENGTH(295-305mm)	2
		DISSECTING SCISSORS STRAIGHT STANDARD WITH CUTTING EDGE LENGTH(295-305mm)	1

Dr Vikas Singh

M.S. FICGS, F.MAS, FICS, FCI, FALS-HPB  
 AILS Course Director  
 Professor  
 In-charge - Unit 3  
 Department of General Surgery  
 Dr Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)

Dr. Anil Srivastava  
 Additional Professor  
 Department of General Surgery  
 Lucknow

Dr. Prashant Gupta  
 M.S., F.M.R.C., F.M.A.S., F.I.A.G.E.S.  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**SURGICAL INSTRUMENTS (GENERAL TRAUMA SET)**

	DISSECTING SCISSORS CURVED STANDARD WITH CUTTING EDGE LENGTH(175- 185mm)	2
	DISSECTING SCISSORS STRAIGHT DELICATE WITH CUTTING EDGE LENGTH(175- 185mm)	1
MAYO'S	ROUND BLADE, CURVED WITH CUTTING EDGE, LENGTH 155-180 MM)	1
	ROUND BLADE, STRAIGHT WITH CUTTING EDGE, LENGTH 155-180 MM)	1
MULLER RECTAL SCISSORS	S SHAPED, 325 MM	1
10 TISSUE DISSECTING FORCEPS DEBAKEY	LENGTH-240-250mm, 1.5-2mm TIP	2
	LENGTH 145-155 MM 2MM TIP	2
	ANGLED 200 MM, 8 INCHES, 40 °, TIP 2MM	2
	350MM, ATRAUMATIC	2
TOOTHED STANDARD MODEL	LONG=LENGTH-240-250mm, 1×2 TEETH	2
	MEDIUM=LENGTH-140-155mm, 1×2 TEETH	2
NON TOOTHED STANDARD MODEL	LONG=LENGTH-240-250mm, 2-3 MM WIDE TIP	2
	MEDIUM=LENGTH-140-155mm, 2-3 MM WIDE TIP	2
	GRUENWALD 200MM	2
11 MIXTER RIGHT ANGLED FORCEPS	LENGTH 225-245 MM	2
	LENGTH 135-145 MM	2
	LENGTH 290 MM	2
	LENGTH 180 MM	2
12 BABCOCK FORCEPS	LENGTH 150-165 MM	6
	LENGTH 225-235MM	6
13 BOWEL CLAMPS(DOYEN'S) CRUSHING	STRAIGHT-LENGTH-230-240MM	2
	CURVED-LENGTH-230-240MM	2

Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery

Dr Vikas Singh  
MS, FIAGES, FIMAS, FICS, FCLS, FALS, HPB  
ATLS Course Director  
Professor  
Incharge - Unit 3  
Department of General Surgery  
Dr Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

Dr. Prashant Gupta  
M.S., M.D., F.I.C.S., F.I.M.S., F.I.A.G.S.  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**SURGICAL INSTRUMENTS (GENERAL TRAUMA SET)**

NON CRUSHING	STRAIGHT-LENGTH-230-240MM	2
	CURVED-LENGTH-230-240MM	2
MULLER TYPE	375 MM	2
PAYR INTESTINAL CLAMP	315 MM X 146 MM	2
SIGMOID ANASTOMOSIS FORCEPS (RIGHT ANGLED)	230 X 80 MM	2
KERSTING SIGMOID ANASTOMOSIS FORCEPS	300 MM	2
14 NEEDLE HOLDER DELICATE PATTERN	LENGTH 150-160 MM	1
	LENGTH 200-210 MM	1
	LENGTH 295-305 MM	1
HEAVY PATTERN / HEGAR	LENGTH 175 MM	1
	LENGTH 205 MM	1
15 KIDNEY TRAY	LENGTH 165-185 MM	1
	LENGTH 250-265 MM	1
	LENGTH 290-305 MM	1
16 BOWLS	WITH CAPACITY OF 60 ML, 400 ML, 1000 ML & 2500 ML	1 EACH
17 MOYNIHANS FORCEPS	CURVED, LENGTH 5-3/4 INCHES, SERRATED	2
18 GIL WERNET RETRACTOR (FOR RENAL PELVIS)	STANDARD SIZE	1
19 BALFOUR SELF RETAINING ABDOMINAL RETRACTOR	WITH 10 " SPREAD, FENESTRATED SIDE BLADES AND CENTRE BLADE OF STANDARD SIZE	1
20 MATHIEU RECTAL SPECULUM	TRIVALVED, 215 MM X 95 MM FOR STERILIZING INSTRUMENTS	1
21 TRAY	(WITH PERFORATION) WITH COVER WIDTH 250-300 MM, DEPTH 75-100MM, LENGTH 250-300 MM	1

FOR STERILIZING INSTRUMENTS

Dr Vikas Singh  
M.B. FIAGES, F.MAS, FICS, F.C.S., F.C.S. (S), F.P.S. (S)  
ATLS Course Director  
Professor  
In-charge - Unit 3  
Department of General Surgery  
Dr. Ram Manger Lal Institute of Medical Sciences  
Lucknow (UP)

  
Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.I. 144 B, Lucknow

  
Dr. Prashanti Gupta  
M.S., F.I.M.S., F.M.A.S., F.I.A.G.E.S.  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**SURGICAL INSTRUMENTS (GENERAL TRAUMA SET)**

	(WITH PERFORATION) WITH COVER WIDTH 250-300 MM, DEPTH 75-100MM, LENGTH 350-400 MM	1
	FOR STERILIZING INSTRUMENTS (WITH PERFORATION) WITH COVER WIDTH 250-300 MM, DEPTH 75-100MM, LENGTH 500-550 MM	1
22	DRESSING DRUMS/CONTAINERS WITH LIDS 15 INCHES x 12 INCHES 11 INCHES x 9 INCHES	1 1
23	SINUS FORCEPS STRAIGHT WITH SERRATED TIPS; LENGTH 7 INCHES	1
24	METALLIC SUCTION CANNULA 7 FR TIP, 7-1/2 INCHES LENGTH APPROX. 9 FR TIP, 7-1/2 INCHES LENGTH APPROX	1 1
25	POOL SUMP SUCTION CANNULA WITH OUTER TUBE 225 MM X 10 MM	1
26	SURGICAL TRAY WITH LID 450MMx350MMx80MM APPROX	2
27	TITANIUM LIGATING CLIP APPLIERS 200 MM, ANGLED 25 DEGREE 150 MM, ANGLED 25 DEGREE	2 2
28	KELLY ANUSCOPE 160 MM X 25 MM	1
29	KELLY PROCTOSCOPE 1 140 MM X 20 MM	
30.	BULLDOG CLAMPS MM, JAW LENGTH 27 MM MM, JAW LENGTH 27 MM	2 2
31.	CASTROVIEJO NEEDLE HOLDER SMOOTH JAWS SMOOTH JAWS	1 1

- i. STRAIGHT-LENGTH 45-55
- ii. CURVED-LENGTH 45-55
- i. 210-220 MM WITH
- ii. 170-180 MM WITH

*Dr. Ravi Srivastava*  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

*Dr. Vikas Singh*  
MS, FRCS, FRCR, FICS, FICLS, FALS, HPB  
MCS Course Director  
Professor  
Incharge - Unit 3  
Department of General Surgery  
Dr Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

*P.K.*  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

*Dr. Prashant Gupta*  
M.S., PROFO, FMAS, FIAGES  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

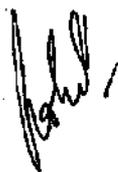
**SURGICAL INSTRUMENTS (GENERAL TRAUMA SET)**

33	RYDER NEEDLE HOLDER	210MM, STRAIGHT
1		
32:	DEBAKEY SATINSKY VASCULAR CLAMPS	LENGTH 250-260 MM
1		
33.	POT SMITH VASCULAR SCISSORS	175-185 MM, 55° ANGLE
APPROX	1	
34.	CORONARY FORCEPS	208 MM APPROX
1		

NOTE: ALL THE ABOVE MEASUREMENTS ARE APPROXIMATE VALUES

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Dr. Rohit Srivastava  
 Dr. Rohit Srivastava  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

Dr. Vikas Singh  
 M.S. (Gen. Surg.) FRCR FRCR FRCR FRCR FRCR  
 M.S. (Gen. Surg.) Director  
 Department of Surgery  
 Dr. R.M.L.I.M.S., Lucknow  
 (Lucknow 100)



Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

Dr. Prasenjit Gupta  
 M.S. (Gen. Surg.) FRCR FRCR FRCR FRCR FRCR  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

**SURGICAL INSTRUMENTS (MISCELLANEOUS)**

S No	INSTRUMENTS	SPECIFICATIONS	QTY
1.	ALLIS FORCEPS	LONG(5x6) 190mm approx	4
		MEDIUM(5X6) 155 approx	4
2.	ARTERY FORCEPS(CURVED)	LONG 185 mm approx	4
		MEDIUM 140mm approx	4
		SMALL 125mm approx	4
3.	KOCHER'S FORCEPS	LONG 240mm approx	4
		MEDIUM 200mm approx	4
4.	RETRACTOR		
5.	CZERNY	length 180-205mm approx, blade width 20-25mm, depth 38-45mm	2
6.	LANGENBACK	length 220-225mm approx, blade width 10-15mm, depth 40-50mm	2
		length 220-225mm approx, blade width 10-15mm, depth 28mm	2
7.	MORRIS	245 x 70 x 65 mm	4
		245 x 70 x 50 mm	4
8.	DEAVER	MEDIUM=length 290-310mm approx, blade width 50-55mm	2
		SMALL=length 290-310mm approx, blade width 25-30mm	2
9.	SCISSORS		
	METZENBAUM	DISSECTING SCISSORS CURVED STANDARD	
		WITH CUTTING EDGE LENGTH(295-305mm)	2
		DISSECTING SCISSORS CURVED STANDARD	
		WITH CUTTING EDGE LENGTH(175-185mm)	2
		DISSECTING SCISSORS CURVED DELICATE	
		WITH CUTTING EDGE LENGTH(145 mm approx)	2
10.	TISSUE DISSECTING FORCEPS		
11.	TOOTHED STANDARD MODEL	LONG= LENGTH-240-250mm, 1x2 TEETH	4
		MEDIUM=LENGTH-140-155mm, 1x2 TEETH	4
12.	NON TOOTHED STANDARD MODEL	LONG= LENGTH-240-250mm, 2-3 MM WIDE TIP	4
		MEDIUM=LENGTH-140-155mm, 2-3 MM WIDE TIP	4
		GRUENWALD 200MM	4

Dr. Vikas Singh

MS FRIGES + MAS FICS FCLS FALS-HPB  
ATLS Course Director

Professor

Incharge - Unit 3

Department of General Surgery

Dr. K. M. Manohar Bhabha Institute of Medical Sciences  
Lucknow (UP)

Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Dr. Prashant Gupta  
M.S., FRCS, FRCR, FRCR, FRCR  
Professor  
Dept. of Surgery  
Sardar Patel College, Agra

**SURGICAL INSTRUMENTS (MISCELLANEOUS)**

13.	MIXTER RIGHT ANGLED FORCEPS	LENGTH 225-245 MM	4
		LENGTH 135-145 MM	4
		LENGTH 290 MM	4
14.	BABCOCK FORCEPS	LENGTH 150-165 MM	4
		LENGTH 225-235MM	4
15.	BOWEL CLAMPS(DOYEN'S)		
	NON CRUSHING	STRAIGHT-LENGTH-230-240MM	4
		CURVED-LENGTH-230-240MM	4
16.	NEEDLE HOLDER		
	(DELICATE PATTERN)	LENGTH 150-160 MM	2
		LENGTH 200-210 MM	2
	(HEAVY PATTERN)	LENGTH 295-305 MM	1
17.	KELLY ANUSCOPE	160 MM X 25 MM	2
18.	KELLY PROCTOSCOPE	140 MM X 20 MM	2

**Quality Specifications**

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3. It should be non-magnetic
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 Dr. P. Nit Srivastava  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

  
 Dr. Vikas Singh  
 MS FIAGES FMAS FICS FCLS FALS-HPB  
 ATLS Course Director  
 Professor  
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 Department of General Surgery  
 Dr. Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
 Dr. Preshant Gupta  
 M.S., MCh, FIAGES  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

# SURGICAL WORKSTATION WITH APC or SURGICAL WORKSTATION (HIGH END WITH ALL ACCESSORIES)

## TECHNICAL SPECIFICATIONS

1. An integrated RF Electro Surgical Unit (For electrosurgical Cut & Coagulation modes for the optimum effect of HF surgery)
2. Vessel Sealer (For thermofusion/sealing & dissection of vessels & tissues structures, during open and laparoscopic surgeries)
3. Argon plasma coagulation unit (For homeostasis of bleeding tissues & devitalization of pathological tissues & stops bleeding, non-contact technology for coagulation)
4. Water Jet Technology (Hybrid technology for elevation & separation of tissue layers with minimal bleeding, Parenchyma can be dissected and Vessels & nerves prepared)
5. High-End Suction Module: (For permitting good visibility of target surgical site automatically).
6. Automatic Smoke Evacuation Unit- (Optional), price to be quoted separately.
7. Mobile Trolley: mobile trolley of same make/ reputed make with locking castors, Built provision of - Argon Gas cylinder, Electro Surgical Unit, Vessel Sealer, APC Unit, Water jet Unit, and High-End Suction

**An integrated RF Electro Surgical Unit (For electrosurgical Cut & Coagulation modes for the optimum effect of HF surgery)**

1. Vessel Sealer (For thermofusion/sealing & dissection of vessels & tissues structures, during open and laparoscopic surgeries)
2. The equipment should be micro-controlled based & should adjust the power to get the desired surgical effect on the tissue. All settings should be controlled by the machine and according to the tissue delivery. Power should be displayed on the screen with a graphing facility to show the delivered power.
3. Diathermy machine should be microprocessor controlled, US-FDA I European Certificate marked in accordance with the medical device's directive (93/42/EEC) 04 digit, minimum 40 installation base in the northern part of India with regional after-sales service centre of the principal company in the north region for uptime guarantee.
5. Should have 8 cutting and more than 8 coagulation modes, namely Auto cut, High cut, Dry cut, Bipolar cut, and Bipolar Resection cut (saline). Coagulation modes should have - Soft Coagulation, Swift Coagulation, Forced Coagulation, Spray coagulation, Bipolar soft coagulation, Bipolar forced coagulation, Bipolar Resection coagulation (Saline), Twin coagulation, Biclamp - Bipolar Thermofusion and precise coagulation.
6. The system should have a Monopolar Cut & Coagulation Mode, two Bipolar Modes with auto bipolar start & stop and Vessel fusion technology all integrated into one system.
7. Should have Power and Voltage automatic regulation features to prevent tissue damage and
8. charring. The output voltage should be regulated at various levels.
9. The System should have LCD Backlight adjustment for good visibility in the operating room,
10. patient plate monitoring facility, audiovisual alarm, and deactivated output if contact between the patient and the patient plate is not proper to eliminate the risk of patient burns.

Dr. Vikas Singh  
 MS, FIAGES, FMAS, FICS, FCLS, FALS, HPB  
 HLLS Course Director  
 Professor  
 Incharge - Unit 3  
 Department of General Surgery  
 Dr. Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)

Dr. Rohit Srivastava  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

Dr. Prashant Gupta  
 M.S., FICRO, FMAS, FIAGES  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

## SURGICAL WORKSTATION WITH APC or SURGICAL WORKSTATION (HIGH END WITH ALL ACCESSORIES)

11. Special bipolar mode for coagulation of vascular tissue (Thermofusion) up to 7 mm width
12. reusable hand instruments for open as well as laparoscopic surgeries.
13. Vessel sealing and cutting simultaneously.
14. The unit should be 510 K approval for a 7mm Vessel.

**Argon plasma coagulation unit** (For homeostasis of bleeding tissues & devitalization of pathological tissues & stops bleeding, non-contact technology for coagulation)

1. For management of bleeding and devitalization of tissue abnormalities achieved by optimal coordination with RF generator
2. The Argon Plasma Coagulation system should have automatic parameters set for various types of instruments and automatic depth-controlled plasma regulation.
3. Should have three different APC modes suitable for different indications
4. Precise APC - adjustment made using the effect settings
5. Pulsed APC - adjustment made using the parameter power settings
6. Forced APC - adjustment made using the parameter power settings
7. Should have Adjustable argon flow rate from 0.1L/min to 8L/ min in steps of 0.1L/min with automatic regulation of selected flow rate.
8. Should the facility use Argon plasma coagulation and monopolar coagulation simultaneously
9. Should have automatic monitoring of flow rates, Argon supply and auto purge facility. It
10. should have the facility to connect with the central gas supply.
11. Should give a visual display of argon gas bottle content and should give an Acoustic alarm when
12. bottle content reaches a minimum.
13. Should have facility for the activation of the unit by foot pedal of the Electro Surgical unit.
14. Should have the facility to use in double-balloon endoscopy procedures.
15. Should have facilities for Argon-supported cutting and coagulation.

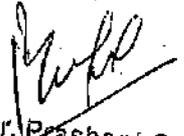
**Water Jet Technology** (Hybrid technology for elevation & separation of tissue layers with minimal bleeding, Parenchyma can be dissected and Vessels & nerves prepared)

1. High-End Suction Module: (For permitting good visibility of target surgical site automatically).
2. For the management of separating the different tissue types with their varying elasticity and firmness with the help of adjusted water pressure based on the kinetic energy principle.
3. Should have pressure range: 1-80 bars & Volume flow: 1-65ml/min. It should indicate delivered fluid vol.
4. Should adapt any sterile saline solution bag (disposable) as a separation medium.
5. Should be integrated with Electrosurgical workstation with other accessories and facilities to connect Monopolar coagulation with the applicator
6. Should have the facility to individually configure programs for different surgeries.
7. Water jet activation should be via footswitch and Remote facility for switching between two different user settings.

  
Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

  
Dr. Vikas Singh  
M.S. FIAGES, FMAS, FICS, FCL, FALS, HNB  
ATLS Course Director  
Professor  
Incharge - Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCU  
Dr. RMLIMS, Lucknow

  
Dr. Prashant Gupta  
M.S., FIAPC, FMAS, FIAGES  
Professor  
Dept. of Surgery  
GGM Medical College, Agra

# SURGICAL WORKSTATION WITH APC or SURGICAL WORKSTATION (HIGH END WITH ALL ACCESSORIES)

- 8. Should have a facility for various applicators to be used in Laparoscopy, flexible endoscopy, and open surgeries.

The Complete Surgical Workstation should be supplied along with essential accessories from the same original equipment manufacturer, an affidavit for the same must be submitted by the bidder, or else the bid will be rejected.

1. Reusable hand pencil with facility for swapping between programs - 01 unit
2. Reusable patient plate Adult with cable - 01
3. Single Use electrosurgical pencil electrode - 100 units
4. Single Use scrub pad - 250 units
5. Single-use Patient plate with equipotential ring - 100 units
6. Reusable Thermofusion hand instrument for Open Surgeries (for vasculatures up to 7mm) - 04 units
7. Reusable Thermofusion hand instrument for Laparoscopic Surgeries (for vasculatures up to 7mm.) - 02 Units
8. Reusable Bipolar forceps with irrigation port & cable - 04 each
9. Sealing and Cutting hand instrument, 5mm bowel-shaped with a maximum of 1.1 mm thermal spread - 02 units
10. Footswitches with facility for swapping between programs.
11. Argon Plasma Coagulation 3 button electrosurgical pencil, connecting cable, probes, and applicators for both Laparoscopy & Open surgery - 02 units
12. An argon-assisted cutting instrument for open surgery and laparoscopic surgery - 03 units (01 for Laparoscopic and 02 for open surgeries)
13. Complete set of Water Jet accessories for Laparoscopy and Open Surgery for 50 liver resections. (10 laparoscopic and 40 open liver resections)
14. Original Workstation trolley with attached Suction unit.

### QUALITY SPECIFICATIONS

- 1. Should be USA FDA approved and European CE (from a notified body with four-digit identification number) certified.

**Dr Vikas Singh**  
 MS FIAGES FMAS FICS FCLS FALS-HPB  
 ATLS Course Director  
 Professor  
 Incharge - Unit 3  
 Department of General Surgery  
 Dr Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)

**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**Dr. Rohit Srivastava**  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

**Dr. Prashant Gupta**  
 M.S., D.URO, FMAS, FIAGES  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

# ULTRASONIC AND VESSEL SEALER DEVICE or ULTRASONIC ENERGY SOURCE or HARMONIC MACHINE WITH VESSEL SEALER

## TECHNICAL SPECIFICATIONS

1. System should be with generator that provides ultrasonic energy and advanced RF energy technology for soft tissue dissection and vessel sealing up to 7mm through single or different probes.
2. System should have automatic instrument recognition
3. Both hand switch and foot switch control mode should be available.
4. System should have touch screen display.
5. System should have ability for software updates via USB/LAN and other sources.
6. System should have standby mode to ensure safety.
7. System should have onscreen warning display system for generator overheating, generator software upgrade, hand piece errors and instrument errors.
8. System should provide class 1 protection against electric shock; should not have lateral thermal spread more than 2 mm.
9. System should come equipped with system diagnostics and troubleshooting guide to pin point any problems in the systems, should have service centre in India.
10. System should be able to power ultrasonic energy equipments with about 47 - 55.6 KHz frequency and have the ability to power ultrasonic energy equipments in the frequency range of 30 -80 KHz in future.
11. The hand piece of the system should come with an in built transducer and system should be able to power energy instruments with micro processor controlled bipolar electrosurgical radiofrequency technology.
12. System should be equipped with advanced RF energy technology that provides temperature controlled energy delivery which should maintain tissue temperature approximately at 100-120 degree Celsius.
13. System should have RF energy hand instruments one blade technology that provides tissue/vessel seal strength up to and including 7 mm to withstand bursting pressure of more than three times systolic pressure, compatible with hand probe with 5 mm shaft diameter.
14. System should be compatible with ultrasonic hook for laparoscopic procedures.
15. System should be compatible with ultrasonic hook and blades for open surgery.
16. System should consist of
  - i) Generator
  - ii) Footswitch and cable - 1 No
  - iii) Hand pieces -2 pieces
  - iv) Ultra sonic probe for open surgery: 5 No (of each 9 cm & 17 cm)  
Approx 9 cm & approx 17 cm shaft , curved, tapered tip for precise dissection, seals 5 mm vessels as well as lymphatics with 15-16 mm active blade and 240 ° hand activation, triggers which support multiple hand positions.
  - v) Ultra sonic probe for minimal invasive surgery: 5 No  
5 mm lap hand activated curved coagulating shears capable of sealing blood vessels up to 5 mm diameter, approx 35-36 cm shaft length with adaptive

Dr. Rohit Srivastava  
Additional Professor  
Department of General Surgery  
Dr. R.M.L.I.M.S., Lucknow

Dr. Vikas Singh  
M.S., F.MAS, FICS, FCLS, M.A.S., HFEB  
ATLS Course Director  
Professor  
Incharge - Unit 3  
Department of General Surgery  
Dr. Ram Manohar Lohia Institute of Medical Sciences  
Lucknow (UP)

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

Dr. Prashant Gupta  
M.S., F.M.A.S., F.M.A.S., F.I.A.G.S.  
Professor  
Dept. of Surgery  
S.N. Medical College, Agra

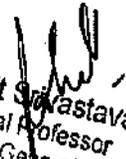
# ULTRASONIC AND VESSEL SEALER DEVICE or ULTRASONIC ENERGY SOURCE or HARMONIC MACHINE WITH VESSEL SEALER

tissue technology, ergonomic handle. Ergonomic handle, capable of back coring, spot coagulation andotomy creation, should have 15-16 mm curved active blade

- vi) RF energy instruments:  
Hand probe for lap vessel sealing with approx 5 mm shaft diameter, the shaft length approx 35-36 cm for lap, seals and transects vessels up to 7 mm with 360° of shaft rotation. Both open and lap devices should be having temperature controlled mechanisms within the jaw controlling temperature below 100°. – 5 No  
Hand probe for open vessel sealing. – 5 No
- vii) Price of each probe should be quoted separately as well which should be freezed for 3 years for future procurement of these probes.

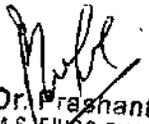
## QUALITY SPECIFICATIONS

- 1. Should be USA FDA approved and European CE (from a notified body with four-digit identification number) certified.

  
**Dr. Rohit Srivastava**  
 Additional Professor  
 Department of General Surgery  
 Lucknow

  
**Dr Vikas Singh**  
 MS, FIAGES, FMAS, FICS, FCL, STALS, HNB  
 ATLS Course Director  
 Professor  
 Incharge - Unit 3  
 Department of General Surgery  
 Dr Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

  
**Dr. Prashant Gupta**  
 M.S., F.I.Y.R.O., FMAS, FIAGES  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

**VULSELLUM FORCEPS****Technical Specifications**

S. NO	INSTRUMENT	QTY
1	Vulsellum Forceps (Curved) 10 INCHES APPROX	1
2	Vulsellum Forceps (Curved) 8 INCHES APPROX	1

**Quality Specifications**

1. It should be made of high-grade metal
2. It should be of high quality and precision
3. It should be non-magnetic
4. It should have bar coding and should have anti glaring surface for better vision.
5. It should be US FDA / European CE approved

*[Signature]*  
**Dr. Rohit Srivastava**  
 Additional Professor  
 Department of General Surgery  
 Dr. R.M.L.I.M.S., Lucknow

*[Signature]*  
**Dr. Vikas Singh**  
 M.D. MRCS (Ed), F.M.S. F.I.C.S. F.C.S. F.A.S. H.F.B.  
 ATLS Course Director  
 Professor  
 Incharge - Unit 3  
 Department of General Surgery  
 Dr. Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)

*[Signature]*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

*[Signature]*  
**Dr. Prashant Gupta**  
 M.S. (URO), F.M.S., F.I.A.G.S.  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

**WEIGHING MACHINE**

- Electronic, Rechargeable, Digital Personal Weighing Scale for Human Body
- LCD display
- Should be able to measure at least up to 180 kgs of weight
- Auto off function
- Should be with low battery & overload indicator

*[Signature]*  
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 Additional Professor  
 Department of General Surgery  
 Lucknow

*[Signature]*  
**Dr. Vikas Singh**  
 MS FIAGES, FMAS, FICS, FCLIS, FALS, HPD  
 ATLS Course Director  
 Professor  
 Incharge - UHS  
 Department of General Surgery  
 Dr. Ram Manohar Lohia Institute of Medical Sciences  
 Lucknow (UP)

*[Signature]*  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

*[Signature]*  
**Dr. Prashant Gupta**  
 M.S., FIQR, FMAS, FIAGES  
 Professor  
 Dept. of Surgery  
 S.N. Medical College, Agra

# Urology



**Declaration Certificate about Technical Specifications  
related to Department of Urology by committee  
members**

SR. NO.	NAME OF EQUIPMENT	GO NUMBER	APPROX. COST
1.	Endoscopes (SEMIRIGID URETERO-RENSCOPE)	GO-7-Dec-2022 GO-23-Aug-18 Suchi-4	7 Lacs
2.	Endoscopy unit with Harmonic machine (CYSTOSCOPE, RESECTOSCOPE, PNEUMOLITHOTRIPTOR PROBE & ADVANCED BIPOLAR AND ULTRASONIC ENERGY GENERATOR)	GO-7-Dec-2022 GO-7-Dec-2022	60 Lacs
3.	Endoscopes (NEPHROSCOPE)	GO-23-Aug-18 Suchi-4 GO-7-Dec-2022	7 Lacs
4.	MINI NEPHROSCOPE	GO-7-Dec-2022	10 - 12 Lacs
5.	Surgical Instruments (URETHROTOMY SET)	GO-7-Dec-2022	5 Lacs
6.	INTRA CORPOREAL PNEUMATIC LITHOTRIPTOR (LITHOCLAST)	GO-7-Dec-2022 GO-7-Dec-2022	45 - 46 Lacs
7.	Endoscopes (PEDIATRIC CYSTO-URETHROSCOPY SET)	GO-7-Dec-2022 GO-7-Dec-2022	10 Lacs
8.	URETERSCOPE	GO-23-Aug-18 Suchi-4	7 Lacs

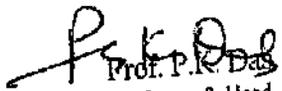
This is to certify that technical specification of all the above-mentioned machine/instruments, approved by the technical committee is not of any specific company. The technical features of the equipment/instruments from all reputed firms in the current market have been included in this specification to the best of my knowledge and belief & in the opinion of the technical committee.

The technical specification duly signed by the technical committee members is attached herewith.

  
**Dr. Alok Srivastava**  
Professor  
DR RMLIMS, Lucknow

**Dr. Alok Srivastava**  
Professor  
Dept. of Urology & Renal Transplant  
Dr. R.M.L.I.M.S., Lucknow

**Prof. P.K. Das**  
Chairman  
Technical specifications committee  
Clinical Subjects & others  
Head, Department of Anaesthesiology & CCM  
DR RMLIMS, Lucknow

  
**Prof. P.K. Das**  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

## Endoscopes (SEMIRIGID URETERO-RENOSCOPE)

### It should have following features :

- Direction of View should be 5-7 degree
- Distal End Outer Diameter should be around 8 - 9 Fr.
- Working length should be around 400 - 450 mm
- Forceps channel diameter should be around 6 - 7 Fr.
- Semi-Rigid type
- Atraumatic tip design
- Built-in maintenance free stop cocks
- Durable detachable bridge for irrigation
- Autoclavable Instrument Tray

### Should be Supplied with following accessories:-

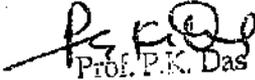
1. Grasping forceps 4.5 - 5.5fr for removal of stones - 6nos
2. Biopsy forceps 5-6Fr - 4nos
3. Self-sealing caps - 40nos
4. HF electrode hook type 4-5Fr

### Certifications:

- US FDA/EU CE

  
 Dr. Alok Srivastava  
 Professor  
 Dept. of Urology & Renal Transplant  
 Dr. R.M.L.I.M.S., Lucknow

Page 1 of 1

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

**Endoscopy unit with Harmonic machine (CYSTOSCOPE,  
RESECTOSCOPE, PNEUMOLITHOTRIPTOR PROBE &  
ADVANCED BIPOLAR AND ULTRASONIC ENERGY  
GENERATOR)**

**Cystoscope with accessories:**

1. New generation wide Angle View Telescope, straightforward telescope. 0-degree enlarged view 0.4 mm, autoclavable fibre optic light transmission incorporated. - 01
2. Telescope new generation wide angle forward Oblique Telescope 30 degree enlarged view. 0.4 mm, autoclavable fibre optic light transmission incorporated. - 01
3. Cystoscope-ureteroscope- sheath., 22 French, with obturator and two Luer lock adapters. - 01
4. Cystoscope-ureteroscope- sheath., 20 French, with obturator and two lever knock adapters. -01
5. Cystoscope-Ureteroscope-sheath, 15/ 3.7, French with obturator and two lever lock adapters. - 01
6. Telescope bridge with two lockable instrument channels and one lock. - 01
7. Compatible grasping forces for removal of foreign bodies, 7 French double action jaw, flexible length 40 centimetres. -01
8. Scissor 7Fr single action jaw, flexible compatible with sheath length 40 centimetres. 01
9. Compatible injection cannula, 6 Fr flexible, self-retaining length 50 centimetres. -01.
10. Rigid optical biopsy forceps. Double action jaw. - 01
11. Adapter for use with Resectoscope seat. - 01

**Resectoscope with accessories:**

1. Monopolar, resectoscope working element with (for double single stem-loop), all accessories and spare high-frequency cords
2. Resectoscope, sheath, including the connecting tube for in and out flow, 26 Fr oblique. break, rotatable inner tube with ceramic insulation, used with working element. - 01
3. Compatible standard obturator for use with sheath, 20/26 French. - 01
4. Compatible visual obturator for use with sheath -01
5. TOOMEY bladder syringes 3CC-02
6. ELLIKEvacuator, with locking device LO-02
7. Cutting loop O, angled compatible 24/26 French -24
8. Coagulating electrode compatible 24/26 French -104
9. High-frequency cord (compatible) monopolar. - 02
10. Bipolar resectoscope working element to be used for bipolar underwater cutting with all required accessories for bipolar endoscopic surgery-02
11. Optical urethrotome sheath 20:23 French, with channel luer lock adapters 01
12. Compatible operator for urethrotome sheath 20/22 French -01
13. Cold knife straight not be used with HF-current. -06.

Dr. Anil Srivastava  
Professor  
Dept. of Urology & Renal Transplant  
Dr. R.M.L.I.M.S., Lucknow

Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

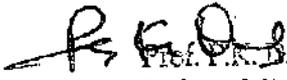
**Advance Bipolar and Ultrasonic Energy Generator and Accessories:**

1. ultrasonic energy and radio frequency energy single generator unit combining both -01
- 2 (a). Ultrasonic 7 mm probe for lap surgery - 05
- 2 (b). Advanced RF Probe 7 mm for lap surgery - 05
- 3 (a). Ultrasonic 5 mm probe for open surgery - 05
- 3 (b). Advanced RF probe 7 mm for open surgery - 05
4. Transducer for lap surgery - 02
5. Transducer for open surgery - 01

**Certifications:**

- 1. • US FDA/ EU CE

  
**Dr. Alok Srivastava**  
 Professor  
 Dept. of Urology & Renal Transplant  
 Dr. R.M.L.M.S., Lucknow

  
**Prof. P.K. Das**  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## Endoscopes (NEPHROSCOPE)

### The Adult Nephroscope should have following Specifications:

- Should be of at least 230 mm in length and the angle of view should be 30 degree to visualize the instruments in the field immediately after introduction.
- Should have at least 4mm instrument channel.
- Should have an outer sheath of 24 to 25 Fr, for the telescope to be used as a continuous flow instrument.
- Should be able use the scope as a cystoscope as well and obturator to be provided to facilitate its introduction into the urethra for Cystoscopy.
- Should supply an adapter for Ellick evacuator or Toomy's for evacuation of clots and stone fragments.
- Should have a Light Guide Cable as an Accessory along with Light Guide Adapters so that the Nephroscope can be connected to any existing branded light source of the hospital.
- Should supply the following accessories :
  - a. 3 pronged grasper with a lumen, to facilitate pneumatic probes for stone fragmentation - 3
  - b. Toothed Grasper with a lumen - 4nos.
  - c. Grasping Forceps fine toothed, 3.25x400mm - 4nos.
  - d. Bougies Set 9-25Fr - 2nos.
  - e. Cleaning & maintenance kit-1 set.

### Certifications:

- US FDA/ EU CE

Dr. Atik Srivastava  
 Professor  
 Dept. of Urology & Renal Transplant  
 Dr. R.M.L.I.M.S. Lucknow

Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. R.M.L.I.M.S. Lucknow

**MINI NEPHROSCOPE**

Nephroscope should be of maximum size of 12 Fr. with Working Channel for instruments of 5 Fr.

Nephroscope must have automatic pressure control system design to allow broken stones (of upto 4mm) to get evacuated automatically when used with pressure irrigation.

**In addition, the following items must also be provided as part of the Set**

**1. One Step Dialators (with central channel for Guide Wire)**

- |  |        |
|--|--------|
| a) For use with 15/16 Fr. Operating Sheath     | 1 Nos  |
| b) For use with 16.5/17.5 Fr. Operating Sheath | 1 Nos. |
| c) For use with 21/22 Fr. Operating Sheath     | 1 Nos  |

**2. Operating Sheaths (Standard, Length 15 cms)**

- |                       |       |
|-----------------------|-------|
| a) Size 15/16 Fr.     | 1 Nos |
| b) Size 16.5/17.5 Fr. | 1 Nos |
| c) Size 21/22 Fr.     | 1 Nos |

**3. Operating Sheaths (For use in Supine Position, Length 18 cms)**

- |                       |        |
|-----------------------|--------|
| a) Size 15/16 Fr.     | 1 Nos. |
| b) Size 16.5/17.5 Fr. | 1 Nos. |
| c) Size 21/22 Fr.     | 1 Nos. |

**4. Instruments (Size 5 Fr.)**

- |                     |       |
|---------------------|-------|
| a) Grasping Forceps | 1 Nos |
| b) Biopsy Forceps   | 1 Nos |
| c) Scissors         | 1 Nos |

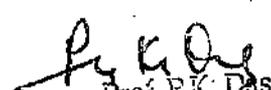
**5. Applicator for Sealant (Flo seal, Surgiflowetc)**

1 Nos

**Certifications:**

- US FDA/ EU CE

  
Dr. Alok Srivastava  
Professor  
Dept. of Urology & Renal Transplant  
Dr. R.M.L.M.S. Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. R.M.L.M.S., Lucknow

## Surgical Instruments (URETHROTOMY SET)

- |   |  |     |
|---|--|-----|
| 1 | Straight Forward Telescope 0°, enlarged view, ø 4 mm, autoclavable                               | 1x  |
| 2 | Urethrotome Sheath, 21 Fr. with channel for Filiform-Bougies and 2 LUER-lock adaptors            | 1x  |
| 3 | Supplementary Sheath, half-round, to insert a balloon catheter, fits urethrotome sheath          | 1x  |
| 4 | Cold Knife, straight not to be used with HF-current  | 12x |
|   | Cold Knife, round not to be used with HF Current   | 12x |
| 6 | OTIS-MAUERMAYER Urethrotome, parallel expanding, length of dilating surface 16 cm, with 2 knives | 1x  |

### Certifications:

- All items quoted must be US-FDA/European-CE approved.

### Important Notes :

1. All items quoted must be from a single world-class manufacturer.
2. Quoting local items will result in immediate disqualification.

  
 Dr. Alok Srivastava  
 Professor  
 Dept. of Urology & Renal Transplant  
 Dr. R.M.L.I.M.S. Lucknow

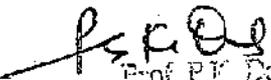
  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## INTRA CORPOREAL PNEUMATIC LITHOTRIPTOR (LITHOCLAST)

The Dual Action Lithotripsy System must have followings:

1. Should have a single generator for both ultrasonic and low frequency mechanical energy integrated in the same machine.
  2. The system should be able to deliver these energies by Same probes and Hand pieces
  3. The system should have a Surgeon Controlled / Hand Activation Transducer & Suction
  4. The system should be equipped with Surgeon Control and have probe of 3.76mm probe size providing the largest Inner Lumen for stone fragments evacuation.
  5. The unit should be supplied with following probes : 3.76mm, 3.4mm, 1.83mm, 1.50 mm, 0.97mm
  6. The system should simultaneously produce (at the probe tip):  
-Constant Ultrasonic Wave energy & Intermittent Shockwave (ballistic/mechanical) Energy – high-rate of occurrence  
~300 x per second / 300 Hz Delivered via a Revolutionary Single Probe Design With Large Inner Lumen
  7. The system must fragment and aspirate all stone sizes, shapes; and composition at a faster speed with significant reduction in procedure time benefits the patient, physician and hospital
  8. The system must be Compatible with standard Steam Autoclaving, Sterrad and Sterrad NX cycles
  9. The system must be used for fragmentation of urinary tract calculi in the kidney, ureter, and bladder
  10. The system must offer a complete Probe Size Portfolio – with Single-Use & Re-Usable options (validated to Global CDS requirements)
  11. The system should have Integration of both ultrasonic + high frequency bursts of mechanical wave energies, delivered simultaneously from a single probe with Shock Pulse technology and suction control
  12. The system should effectively fragments and pulverizes stones of various shape, size and composition.
  13. The system must have Increased speed and performance – while generating a lower pitched noise level (less irritating to users)
  14. The system should be of Auto tuning equipped -, a true “plug & play” system
  15. The systems should have a user Friendly Torque wrench design – reduces the force required to assemble probe onto transducer
  16. They system should have a single Hand piece design
  17. The system should also have hand activation which eliminates the need for the footswitch
  18. The system should have Ergonomic Placement of Buttons allows for physician control for all procedures (PCNL, mPCNL, URS, Bladder)
  19. The system should have a transducer with Surgeon Controlled Suction and Integrated Hand Activation
  20. Unit should be supplied with Sterilization Tray
  21. The unit should be have Torque wrench for connecting / disconnecting probes to the hand piece
1. Demonstration whenever required should be arranged.
  2. Five years of warranty followed by five years Comprehensive maintenance contract.
  3. Generator Specifications : • Voltage of 90-264VAC • Frequency 50/60Hz

Dr.  Srivastava  
Professor  
Dept. of Urology & Renal Transplant  
Dr. R.M.L.I.M.S. Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. R.M.L.I.M.S. Lucknow

**Certification:**

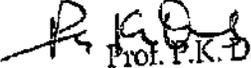
- System should be US FDA / European CE certified.

**Following Probes & Accessories should be supplied with the system:**

1.Lithotripsy Transducer	1nos
2.Lithotripsy Probe, Reusable, 3.76mm	5nos
3.Lithotripsy probe Reusable, 3.40mm	5nos
4.Lithotripsy probe Reusable, 1.83mm	5nos
5.Lithotripsy probe Reusable, 0.97mm	5nos

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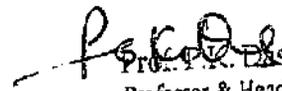
  
 Dr. Anil Srivastava  
 Professor  
 Dept. of Urology & Renal Transplant  
 Dr. R.M.L.M.S. Lucknow

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow

## Endoscopes (PEDIATRIC CYSTO-URETHROSCOPY SET)

1. Telescope – for Pediatric Cystoscopy
  - a. 0 degree angle of view
  - b. Length – 20 cms
  - c. Diameter – 1.2 mm
  - d. Autoclavable
  - e. Fiber optic light transmission
2. Cystoscope Sheath
  - a. 8 French Diameter
  - b. With Working channel 4 Fr for Reflux Needles
  - c. With Obturator
3. Injection Needle
  - a. Rigid
  - b. 3 Fr
  - c. Should be compatible with Cystoscope Sheath
4. Hook Electrode
  - a. Uniolar
  - b. 3 Fr
5. Grasping Forceps
  - a. Double Action Jaws
  - b. Flexible
  - c. 3 Fr
  - d. Length – 28 cms
6. Knife
  - a. Triangular Tip
  - b. Unipolar
  - c. 3 Fr

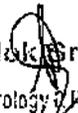
Dr.  Srivastava  
Professor  
Dept. of Urology & Renal Transplant  
Dr. R.M.L.M.S., Lucknow

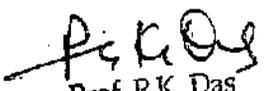
  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLMS, Lucknow

7. With Telescope bridge
8. Pediatric Electrotome Resectoscope Sheath
  - a. 9 Fr
  - b. Connecting Tube with Luer Lock for Irrigation
  - c. With Compatible Working element
  - d. Attachment facility for Unipolar cautery
  - e. Cutting should be by means of spring
  - f. In rest Position, the electrode tip should be inside the sheath
9. Cutting Loop - 5
  - a. Angled
10. Coagulating Electrode - 5
  - a. Hook Shaped
  - b. With Ball end
11. Protection tube
  - a. For Sterilization and Storage of electrodes/currettes/knives

**Certifications:**

- US FDA/ EU CE

  
Dr. Alok Srivastava  
Professor  
Dept. of Urology & Renal Transplant  
Dr. RMLIMS, Lucknow

  
Prof. P.K. Das  
Professor & Head  
Dept. of Anaesthesiology & CCM  
Dr. RMLIMS, Lucknow

**URETERSCOPE****It Should have following features:**

- Direction of view should be 5-7 degree.
- Distal End Outer Diameter should be around 6 – 7 Fr.
- Working length should be around 400 – 450 mm.
- Forceps channel diameter should be around 4 – 5 Fr.
- Semi-Rigid type.
- Atraumatic tip design.
- Built-in maintenance free stop cocks
- Durable detachable bridge for irrigation
- Autoclavable Instrument Tray.

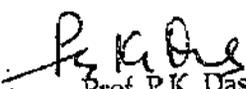
**Should be Supplied with following accessories:**

1. Grasping forceps 3 – 4 Fr. for removal of stones – 4nos
2. Biopsy forceps 3 – 4 Fr. – 2nos
3. Self sealing caps – 40nos

**Certifications:**

- US FDA/ EU CE

  
 Dr. N.K. Srivastava  
 Professor  
 Dept. of Urology & Renal Transplant  
 Dr. R.M.L.M.S.

  
 Prof. P.K. Das  
 Professor & Head  
 Dept. of Anaesthesiology & CCM  
 Dr. RMLIMS, Lucknow