Enclosed Technical Specification for the following items for Cardiac Surgery

01 Hart Lung Machine
02 Heater Cooler Machine
03 ACT Machine
04 Advance Anesthesia Work Station
05 Blood and Fluid Warming System
06 Cardiac Defibrillator, Monitor with external pacing
07 Syringe Infusion Pump
08 Volumetric Infusion Pump
09 Hand Instruments for Cardiac Surgery
10 Ultra Sonic Nebulizer
11 Non Invasive Cardiac Support Pump Integrated with Defibrillator
12 Patient Warming System
13 High End Infant, Paediatric and Adult Ventilator
14 High End Multipara Meter Monitor
15 Xenon Light Source
16 Nurse Call System
17 Octopus
18 Oxygenator
19 Hospital Cubicle Track System
20 High End Sternal Saw
21 Blade Box

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TECHNICAL SPECIFICATIONS OF HEART LUNG MACHINE

1. DESCRIPTION :

Heart Lung Machine is an apparatus through which blood I temporarily diverted, during heart surgery, to oxygenate it and pump it throughout the body, thus maintaining circulation until the heart and lungs are able to return to normal functioning.

2. Technical Specifications:

a) **The unit should be a compact model** and should have 4 pumps and can be used as arterial , suction, vent and cardioplegia with separate power supply and control modules. Should have easy access connectors for interchanging the pump. **The pumps should show accurate measurements** and the machine should be used for performing paediatric and neonate surgery.

b) **The design of pump must be horse shoe race way design and the pumps should have direct drive system and maintenance free. All the Pumps should have pulsatile mode in build. Each Module should work its own.**

c) **Each head should be controlled individually and rotatable in different direction with master – slave control.**

d) Should have a spill proof base.

e) **The quoted model should be of latest generation.**

f) **Machine should show all warnings and alarms in complete text message and different audible tones with different colour codings.**

g) The unit should be supplied with a **Battery back up of minimum of 90 minutes**. Switch over from main power to battery backup should be automatic and immediate. The battery unit should be built in to the pump base and it should be recharged automatic and immediate.

h) **Should have unidirectional hand crank facility** as a critical safety feature hand crank loading should be from top for faster access.

i) **Accuracy: Pump Head raceway accuracy should be 0.03mm, Occlusion accuracy should be – 0.015mm,** Occlusion rollers accuracy should be adequate.

j) **Occlusion: Should have Thump wheel locking Mechanism**

k) Monitors : Pressure monitor (2), Timers(3), Temperature Monitor(4) and all the monitors should be touch screen.

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l) **Pressure Sensor should have 2 modes – Stop Mode & Control Mode.**

m) **Cardioplegia module should have both Manual as well as Automatic operation.**

n) Should be provided with mechanical gas blender.

o) Should be provided with Level Sensor and air Bubble sensor

p) Bubble Sensor should have different bubble detection thresholds including **even micro-bubble detection function.**

q) **Level sensor should be with 2 modes - Normal & Control Mode.**

r) **Must have inbuilt Master UPS** - shows all the details like Battery time, Load time & Remaining time. Should have BSA Calculation

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TECHNICAL SPECIFICATIONS OF HEATER COOLER MACHINE

1. HEATER COOLER MACHINE

a) The unit shall be capable of operating continuously in ambient temperature of 2 - 40.5 degree celcius.

b) The unit should have 3 independent tanks and 3 separate circuits and these circuits should be able to control patient's temperature and also heating and cooling of cardioplegia and should work simultaneously.

c) The accuracy should be 0.1 C. Settings should be adjustable to 0.1

d) The heater cooler unit should also be compatible to get integrated into the heart lung machine.

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Technical Specification for A C T MACHINE

ACT Machine having Single Test Well
2 Point Clot detection facility to get accurate

Results :- One button operation – easy to use.

Tests: Whole Blood Activated Clotting Time **(ACT)**. Accepts Actalyke ACT Tubes with celite, kaolin, glass-bead activators; MAX-ACT Tubes with blended activators; all International Technidyne Hemochron® tubes,

Measurement Range: 0-1500 seconds,

Incubation Temperature: 36.5ºC - 37.5ºC (97.7ºF - 99.5ºF),

Display: 3.2 x 1" (8 x 2.54 cm),

Dimensions :- 15.5 x 12.2 x 16.0cm. (6.1"W x 4.8" H x 6.3"L)

Environment: 15ºC to 30ºC (59 to 86ºF)

Data Transfer Capability: Printer option available for hard copy

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Technical Specification of Advanced Anaesthesia Workstation

1. Should be three gas integrated anaesthesia workstation for ultra modern and super speciality surgical workplaces.
2. Should offer ICU quality ventilator, single user interface of 12.1" (30 cm) colour display and electronic fresh gas dosing suitable for adult, paediatric & neonate.
3. Single user interface should control and display all parameter including control of modes, display of cylinder pressures etc.
4. The machine should be suitable to use at minimal flow upto 500ml fresh gas application.
5. The machine should have automatic calculations and presetting of patient specific ventilation settings via ideal body weight.
6. The machine should have fully automatic menu driven self test and user check list. In case of emergency it should be possible to bypass the self test completely.
7. The system leak test should be done till the Y piece and should not require user interaction during the test.
8. System should be European CE approved and confirms to EN 60601-2-13 (Requirement for safety and essential performance of anaesthesia system)

9. **Gas delivering system :**

a) Unit should have primary connection for Central gas supply for Air, O2 & N2O and as a backup, machine should also have provision for connecting oxygen and nitrous oxide pin index cylinders.
b) Machine should have Electronic fresh Gas mixing and delivery.
c) In case of oxygen failure machine should automatically switchover to air.
d) Audio - visual alarm for failure of Oxygen.
e) Control of minimum 25% Oxygen in fresh gas upto Flow > 1L/min. and atleast 250 ml of Oxygen concentration for minimal flow application (fresh gas flow < 1L/min). No basal flow.
f) Integrated Oxygen flush with self returning valve.
g) O2 safety flow adjustable from 0 to 12 L/min, through the Vaporiser for emergency backup use
h) Machine should also have an independent fresh gas outlet for connection to Bain's or Magill circuit.
i) Fresh gas flow setting from 50ml/min to 12 Ltr/min
j) It should have the indicator to show the efficiency of fresh gas setting while used in Low flow and minimal flow.
k) In the event of complete power loss and battery failure it shall be possible to manually ventilate at 100% Oxygen and deliver anaesthetic agent.

10. **Breathing system :**

a) Compact breathing system suitable for minimal flow anaesthesia, with least patient circuit volume including absorber etc. approx. 3 L (excluding bag) for fast response to change in fresh gas composition.
b) Fresh gas decoupled / compensated breathing system for adult and children
c) Integrated warmer for breathing gas conditioning and avoidance of condensation.
d) Should have facility of sample gas returning back to breathing system.
e) APL valve with direct setting of release pressure.

11. **Integrated Ventilator :**

a) Electronically controlled electrically driven ventilator should not require any driving gas
b) Ventilator suitable for adult, paediatric and neonate without changing of bellows.
c) Automatic breathing circuit Compliance correction. Light weight bellow should not offer any constant PEEP.
d) Spont. Breathing
e) Manual Ventilation
f) IPPV with Plateau adjustment from 0 to 60% of Ti
g) PLV with decelarating flow
h) Pressure controlled ventilation
i) SIMV in VCV & PCV
j) High peak inspiratory flow upto 150 LPM,
k) Tidal volume adjustment range 20 ml to 1400 ml
l) PEEP from 0 to 20 mbar Electronically adjustable
m) Resp frequency from 3 to 100 per min.
n) I:E : max 5:1 to 1:99

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o) Should be able to ventilate with atmospheric air, incase of Oxygen and power failure

12. Ventilator monitoring :

a) Monitoring of Volume, Pressure & Oxygen
b) Should monitor patient compliance
c) Should curves & Loops with fast analysis of change in lung mechanics provided by simultaneous display of reference & real time loops
d) Should display EtCO2, O2 as well as anaesthetic agent, MAC and MACx values and automatic identification of agent.
e) Bar graph display of volumeter, tidal volume, and the difference of inspiratory and expiratory tidal volume
f) Trending for alarms and measured values with graphic trend display
g) The machine should calculate agent consumption and agent uptake by patient on a case by case basis and display of fresh gas consumption in the unit logbook

13. Vaporizers :

a) Temperature / pressure compensated and flow independent vaporizer. Vaporizer should have extended delivery range from 0 to 6 Vol. %. Vaporizer should have transport lock to provide hermetic sealing of agent chamber during transport & storage.
b) The vaporiser should require no calibration in its life time.

14. Alarms:

a) The machine should have adjustable alarm limits for all the parameters with auto set alarm function.
b) The machine should have automatic display of MAC/MACx values and automatic activation of low agent alarm
c) Airway pressure low limit should automatically changes with the PEEP setting changes

15. Machine should have 3nos. RS 232 connectivity port for interface to patient monitor / HIS for automatic data acquisition.

Specifications for IT enabled patient monitor, and Centralised Automatic electronic anaesthesia data management software:

1. IT enabled patient monitor should be modular and should measure these parameters for all type of patients (Adult, Pedia, Neonatal);
- 12 lead ECG, Masimo SPO2 Technology, NIBP, Dual IBP
- Simultaneous monitoring of dual Temp (1 Core and 1 Skin)
- Should have interface module to anaesthesia workstation to view waveforms, trends on patient monitor.
- Upgradeable to modules like BISx, NMT, 4 channel EEG, Transcutaneous EtCO2, PiCCO with 4IBP, CO with 4IBP, etc is must.
2. Monitor should be IT enabled for single point access and ready to run web based applications (like cath Lab, X-ray, DICOM, HIS and more) without requiring extra server, hardware and software
3. Should give direct access to Web-based applications, without requiring extra servers or licenses (such as Microsoft® clients, Citrix)
4. The monitor should have:
- Highly visible, bright , high resolution 19" or above Medical grade Touchscreen IT workstation screen.
- Oxy CRG, ST analysis, Advance arrhthymia analysis as standard.
- The monitor should have a visual indicator for the type of alarms being generated.
- Alarm should glow in different colour indicating from a distance the seriousness / priority of the alarms.
- Should be able to operate through Touchscreen, Keyboard mouse and rotary knob operation
5. The monitor should display12 or above waveform on a single screen along with related numerical parameters on a single screen. The size of the numeric should be adjustable capable to become bigger for viewing from very long distance.
6. Should have non-volatile graphic and tabular trending of all monitored parameters as standard for minimum 72hrs.
7. It should display 12 lead ECG simultaneously on screen. It should have ST segment analysis/mapping and Arrhythmia analysis.

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8. The IT enabled patient monitor and parameter modules should be US FDA approved for safety and quality assurance.
- It should have calculation packages for Drugs, Hemodynamic and Ventilation
9. It should have be provided with mounting for Anaesthesia machines. .
10. Display setting should have various configurable user defined setups variable as per applications for flexible use of the monitor in various clinical environments
11. Monitor should be capable to display events trends for all monitored parameters and also capable to provide event review based on the events defined by the user of the monitor as per the specific condition of the patient.
12. Bed to bed view facility between monitors should be standard if networked.
13. Should include centralized automatic electronic anaesthesia charting solution, which will collect data from IT enable patient monitor and anaesthesia ventilator.
14. Centralized automatic electronic anaesthesia charting should run on the IT enabled patient monitor screen itself and not additional PC/screen
15. Automatic electronic anaesthesia charting solution should be US FDA approved international guidelines software and not local software
16. Anesthesia charts and data management software should be completely web based and should allow access from any PC on the available network (with proper authentication : user name/password)
17. Automatic electronic anaesthesia charting solution should have proper authentication : user name/password)
18. Printing of reports and daily charts. PDF report generation should be standard.
19. Automatic electronic anaesthesia charting system should store data for minimum five years and should be able to increase the capacity by increasing the harddisk capacity sized.
20. There should not be any limitation of concurrent users that can access the system simultaneously.
21. Charted data should have facility to define charting intervals, flowsheets, time by user based on patient acuity. Charting column for device data should be selected by user and not fixed. Charting column data should be any combination of Automatically acquired device data, Manually entered observations, Lab data, Medication data, Scoring data, Data should be possible to be displayed in graphical or in tabular format. Graphical data can be configured in terms of symbol and color. Should have administration of Input and Output for fluids & Medication with summary report. There should be customized form area where user can define and make tailor make forms for pre-anaesthesia check list, reports, post-op instructions, etc. Should also have customized interventions, event and staff documentation. Most of the inputs area should be selection and not typing.
22. System should support up to 24 hrs of Backfill data from the Patient Monitoring and anesthesia machine data into the charting system to avoid loss of data and enable clinician to focus on patient care first and then using system
23. Pendants, Anaesthesia workstation, Vaporisers, IT enabled patient monitor, and Centralised Automatic electronic anaesthesia data management software, all should be from same manufacturer to maintain uniformity of part and efficient after sales service.
24. **Scope of supply should include.**
- 3 gas Anaesthesia workstation
- Writing surface
- Pipeline connections for all three gases
- Integrated Ventilator & monitor
- Semiclosed breathing system
- Adult & Peadiatric autoclavable patient tubings
- Disposable adult coaxial circuit – 20 Nos.
- Filters – 50 Nos.
- Anaesthetic mask size – Adult & child
- Vaporisers for Isoflourane or Sevoflourane
- Disposable sodalime cannister – 6 Nos
- Water trap 12nos and sampling lines 10 nos.
- Central gas supply hoses (Color coded)
- Basic unit with for ECG(12L), Resp, SPO2, NIBP, Dual IBP ,Dual Temp
- 5/6/10 lead ECG cable - 1 nos per monitor
- Masimo SP02 finger proble Adult - 1 no per monitor
- Masimo extension cable - 1 no per monitor
- Core Temperature probe - 1 no per monitor

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- NIBP hose - 1 no per monitor
- NIBP cuff for adult and paediatric – 1no per monitor
- IBP cable - 2 nos per monitor
- Disposable Transducer with IV kit - 10 nos per monitor
- Interface module between monitor and anaesthesia machine - 1 no per monitor
- Automatic electronic centralized anaesthesia charting system with complete original software and hardware with required networking for 1 OT with UPS
- Instruction for use

Optional Modules (Quote optionally)

- BISx module with 25 sensors
- EEG 4 channel module with spectrum
- NMT Module
- PiCCO Module with 4Ibp

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Technical Specification for Blood and Fluid Warming System

Specification :-

1) Ste Point Temperature :- 41°C,

2) Flow Rates :- KVO to 30,000ml/hr.

3) Alarms (audible and visual) :-
   Over-temperature primary set point 43° C, Over-temperature Secondary set point 46° C
4) Device Rating :- 110VCA/220-240 VCA

5) Dimensions :- 7.5W x 4.5hr. x 10d in (19w x 11h x 25d cm)

6) Weight :-7.4bl (3.3kg)

7) Leakage Current: - Meets regulatory standards for leakage current.

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Technical Specifications for defibrillator cum monitor with external pacing

1. The machine should have facility for ECG Monitoring, defibrillation, external pacing (transcuteneous) & recorder.
2. The Defibrillator should be Biphasic technology, having energy selection up to maximum 200 joules in AED as well as in manual mode.
3. It must be capable of monitoring ECG through ECG cables, Multi function electrodes and paddles through multifunction single cable.
4. The machine should be able to defibrillate Adult, Pediatric patients.
5. The machine should have ECG waveform display on bright high resolution display.
6. The machine should be compact, portable with inbuilt rechargeable battery. The machine should not be more than 7 Kgs with battery and paddles.
7. The machine should have in built recorder printing ECG trace & stored information.
8. The machine should have a facility of External non-invasing pacing with 40 ms pulse width
9. It should have ability to measure chest compression rate and depth in real time with visual feedback on screen with rate and depth indicator.
10. The machine should have user selectable alarm settings.
11. . The machine should work on mains as well as on rechargeable battery
12. The unit should be supplied with Adult and inbuilt pediatric external paddles The machine should have facility to increase/decrease energy selection on paddles as well as on unit .The unit should also have facility to give print out of ECG and shock instantly from paddles.
13. The charging time should be less than 7 secs at maximum energy
14. The unit should be supplied with following accessories /items unit
    a) Battery -1 nos
    b) 3-Lead ECG cable - 1 nos
    c) External defibrillator paddles (pediatric inbuilt in adult)- 1 nos
    d) Multi Function Defibrillator & Monitoring padz/gel sheets - 200 nos
    e) Reusable CPR feedback sensor/or similar product reused at least on 90 patients – 4 nos

15.The unit should have facility to monitor
A)ETC02,
B) NIBP ,
C) SPO2

Also the unit should be upgradable to 12 lead ECG monitoring if required

16. The unit should be U.S FDA approved.

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Technical Specifications for Syringe Infusion Pump

1. Should have facility for automatic syringe size detection for 10ml, 20ml, 30ml, 50ml.
2. Should have facility to accept any unknown brand of syringe in the form of Custom Syringe
3. Should be PCA upgradable
4. Should have Bolus / PCA facility with safety time lock
5. Should have Bolus / PCA administration counter & the data should be available on touch of a key
6. Should have Body Weight Mode for automatic flow rate calculation depending on the patient`s weight
7. Should have Multistage Programming facility (more than 5 stages) in the memory with stage sequence control for target volume & target time
8. Should have LED display of Flow rate for distant viewing & LCD display for viewing the Medicine being infused, Infused Volume & time elapsed simultaneously.
9. Facility to select & make user`s own drug library out of 48 medicines listed in the m/c.
10. Programmable rate KVO (Keep Vein Open) Mode.
11. Should have motorized Pusher movement back & forth
12. Should have facility for front loading of syringe
13. Should have volume limit pre alarm
14. It should be possible to connect the m/c to PC for Central Monitoring
15. The syringe pump should be should be tested as per EN 60601-1-1:1990.
16. The Syringe pump must have passed EMC test EN 60601-1-1, Programmable Electrical Medical Systems:-EN 60601-1-4 & standards for Infusion Pump-EN 60601-2-24.

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Technical Specifications for volumetric infusion pump {With Micro and Macro mode of operation}

Microprocessor based Volumetric automatic infusion pump should have a range from 1-600 ml/hr and micro range 1 to 99.9 ml/hr.
Should have Micro & Macro modes of operation.
Should display total ml infused, set drops/min. and elapsed time on LCD panel at one time.
Should Have Descriptive Alarm Messages on LCD screen with Suggestive Actions
Should have facility to set Target volume & Target time.
Should have Alarms- for high/slow speed, Battery charge low etc.
Should have air in line removal facility with purge mode.
Should work on mains and battery and minimum 3 hours battery backup.
Should work on KVO Mode. KVO rate should be user selectable between 0.1 ml/hr to 9 ml/hr.
Should work on Micro and Macro standard I.V.sets.
Callibration facility for no. of drops per Ml from front panel.
Should have free flow protection feature in case of accidental door opening.
Should work in both modes – Volumetric & Drop counting mode.
Should have nurse call facility with the help of a separate key on the front panel.
Should have potential free contact for remote alarm & Nurse call. Should have fixed drop sensor.
The rates should be stored into memory with facility for memory clear.

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TECHNICAL SPECIFICATION FOR HAND INSTRUMENTS

Sl No	Item	Size
	2nd General Set	
1	BACKHAUS TOWEL CLAMPS	125mm
2	HALSTED MOSQUITO FORCEPS CURVED	125mm
3	HALSTED MOSQUITO FORCEPS, STRAIGHT WITHOUT RUBBER SHOE	125mm
4	SPENCER WELLS HAEMOSTATIC FORCEPS, STRAIGHT	150mm
5	SPENCER WELLS HAEMOSTATIC FORCEPS, CURVED	150mm
6	ALLIS TISSUE GRASPING FORCEPS ATRAUMATIC JAW	150mm
7	ABRAHAM TONSIL HOLDING FORCEPS	205MM
8	MIXTERS LIGATURE FORCEPS	200mm
9	BABY MIXTER LIGATURE FORCEPS	140mm
10	TUBING CLAMP WITH GUARD	200mm
11	DEBAKEY NEEDLE HOLDER	200mm
12	CASTROVIEJO NEEDLE HOLDER STRAIGHT WITH CATCH, FLAT HANDLES	160mm
13	CASTROVIEJO NEEDLE HOLDER STRAIGHT WITH CATCH	200mm
14	KELLYS HAEMOSTATIC FORCEPS HALF SERRATION STRAIGHT	160mm
15	KELLYS HAEMOSTATIC FORCEPS CURVED HALF SERRATION	160mm
16	KOCHERS HAEMOSTATIC FORCEPS STRAIGHT	180mm
17	KOCHERS HAEMOSTATIC FORCEPS CURVED	180mm
18	SPONGE HOLDING DRESSING FORCEPS, STRAIGHT	250mm
19	DEAVERS ABDOMINAL RETRACTOR ADULT 50MM	300mm
20	LANGENBACK RETRACTOR 35MMX15MM	215mm
22	CARDIOTOMY SUCKER ADULT	300mm
23	KIDNEY TRAY 8"	
25	MAYOS SCISSORS STRAIGHT	160mm
26	MAYOS SCISSORS CURVED	160mm
27	SISCO WIRE CUTTER FOR SOFT WIRE SERRATED JAW	180mm
28	B.P.HANDLE NO.3 TO FIT BLADE 10 - 15	
29	B.P.HANDLE NO.7 TO FIT BLADE 10-15	
30	RUSSIAN DISSECTING FORCEPS	160mm
31	BONNEYS DISSECTING FORCEPS PLAIN	150mm
32	SNUGGAR HOOK FOR RUMEL TOURNIQUET	280mm
33	TUBING CLAMP WITH OUT LOCK	125mm
36	ROBIN'S ANCHRING FORCEPS SCREW JOINT 5MM	125mm
	Leg Instruments	
1	WEISLANER MASTOID S/R RETRACTOR SHARP, STRAIGHT 3 X 4 PRONGS	165mm
	MOLLISON SELF RETAINING RETRACTOR 4X4 PRONGS SHARP, CURVED	150mm
2	HALSTED MOSQUITO FORCEPS CURVED	125mm
3	ALLIS TISSUE GRASPING FORCEPS ATRAUMATIC JAW	150mm

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4	MAYO HEGGAR NEEDLE HOLDER	200mm
5	MAYOS SCISSORS CURVED	160mm
6	METZENBAUM SCISSORS STRAIGHT	150mm
7	SEMKEN DELICATE FORCEPS TOOTHED	150MM
	SEMKEN DELICATE FORCEPS TOOTHED	180MM
8	DEBAKEY DISSECTING FORCEPS A/G JAW 1.5MM	200mm
9	B.P.HANDLE NO.4 TO FIT BLADE 18-25	
	2nd Vascular Set	
1	DEBAKEY DISSECTING FORCEPS A/G JAW 1.5MM	200mm
2	DE BAKEY DISSECTING FORCEPS ANGLED JAW 2MM	200mm
3	MAYO HEGGAR NEEDLE HOLDER	180mm
4	METZENBAUM SCISSORS STRAIGHT	180mm
5	DEBAKEY MORRIS 2X3 ASCENDING AORTA CLAMPS A/G JAW ANGLED	175mm
6	DEBAKEY AORTA ANEURYSM CLAMPS 4 CURVES TRAUMANIL JAWS	250mm
7	COOLEY ANASTOMOSIS CLAMP ANGLE 44mm JAW	260mm
8	COOLEY ANASTOMOSIS CLAMP ANGLE 50mm JAW	265mm
	2nd Coronary Set	
1	POTTS-SMITH DRESSING FORCPES	180MM
2	DEBAKEY MICRO BULLDOG CLAMPS ANGLED JAW 10mm	50mm
3	POTTS SMITH VESSEL SCISSORS ANGLED 45Deg	185mm
5	METZENBAUM SCISSORS STRAIGHT	180mm
6	MIXTERS LIGATURE FORCEPS	200mm
7	DIEFFENBACH BULLDOG CLAMP STRAIGHT	35mm
8	COOLEY DILATORS SPATULAS (SET OF 6) 0.5MM TO 3MM DIA MALLEABLE	130mm
9	DEBAKEY VASCULAR DILATOR 1.0MM	190mm
10	DEBAKEY VASCULAR DILATOR 1.5MM	190mm
11	DEBAKEY HEPARIN NEEDLE 3mm TIP	45mm
12	AMERICAN PATTERN SUCTION TIP WITH STILLET	SIZE:2
13	FISCH NERVE HOOK SHARP	185mm
	3rd Valve Set	
1	I.M.A RETRACTOR WITH ONE STERNAL BLADE AND TWO ADJUSTABLE BLADE FOR PREPARATION OF A MAMMARIAE INTERNAE ARM LENGTH - 190mm, CENTER ARM LENGTH - 170mm, SPREAD 190mm, ROCK LENGTH 235mm	
3	MITRAL VALVE HOOK MEDIUM BLUNT	300mm
4	BABY MIXTER LIGATURE FORCEPS	140mm
5	COOLEY ARTERIAL VALVE RETRACTOR LEFT	254mm
6	MITRAL VALVE MEASURER	260mm
7	B.P.HANDLE NO.3 TO FIT BLADE 10 - 15	
8	NELSON METZENBAUM (MC INDOE) DISSECTING SCISSORS T/C TIP STRAIGHT	230mm
9	ECHLIN BONE RONGEUR DOUBLE ACTION 2MM	230mm
13	ALLIS TISSUE GRASPING FORCEPS ATRAUMATIC JAW	200mm
14	MAYO HEGGAR NEEDLE HOLDER	230mm
15	HALSTED MOSQUITO FORCEPS, STRAIGHT	125mm

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16	MIXTERS LIGATURE FORCEPS	200mm
17	DEBAKEY DISSECTING FORCEPS A/G JAW 1.5MM	200mm
18	MIXTERS LIGATURE FORCEPS	230mm
19	MALLEABLE RETRACTORS ASSORTED SIZES	200mm
	MALLEABLE BRAIN SPATULAS NARROW	200mm
20	FISCH NERVE HOOK SHARP	185mm
23	LEMMON DISSECTOR SLIGHTLY CURVED	165mm
25	RUSSIAN DISSECTING FORCEPS	160mm
26	CARDIOTOMY SUCKER ADULT	300mm
	IMA TRAY	
1	CASTROVIEJO NEEDLE HOLDER STRAIGHT WITH CATCH, FLAT HANDLES	160mm
2	CASTROVIEJO NEEDLE HOLDER STRAIGHT WITH CATCH, FLAT HANDLES	185mm
3	MICRO RING FORCEPS WITH WEIGHT Ø 1.0 X 0.5mm	180mm
4	DEBAKEY DISSECTING FORCEPS A/G JAW 1.5MM	200mm

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Technical Specifications for Ultra Sonic Nebulizer

Ultrasonic Nebulizers and not atomizers, should not use pump air to atomize the medicine. Ultrasound should be energy source for nebulization of liquids for inhalation therapy. The working mechanism should involve ultrasound waves to touch to the surface of the liquid(e.g. medicine, water) and merge the liquid into micron size sub particles. To increase therapy efficiency, because of the even distribution of the particle sizes. Doctors should be able of plan nebulisation as treatment with machine. Latest generation Ultra Sonic nebulizer with following added features

1	Intensity Controller to control intensity of mist
2	controled volume of mist& Jet Nebulization in trauma cases
3	Timer for 1hour so treatment can be planned with continuous mode also
4	Facility to attach Oxygen Cylinder
5	Big medicine cups of 350ml to treat multiple patients on same drug
6	Can work from 3 µl with practically no wastage
7	should be connected to ventilators
8	Unit should be table top as well as portable working on multiple power sources like Electricity, Solar power, Ambulance Battery, Car Battery
9	Unit should be supplied with manual with circuit diagram , Mask ,mouth connector for nebulization by mouth , nasal connector for nebulization through nostrils ,extension non latex pipes, spare fuses
10	Noise less level less than 30db
11	Ultrasonic and not piston or diaphragm Ultra sonic Frequency 1.7 MHz
12	Droplet/micron size should be less than 1.5µl Weight Not more than 3Kg
13	Nebulization 2ml/min.with facility for Jet Nebulization under high intensity to acute and Trauma cases
14	ISO,ETDC (Govt. Of India)CE /FDA certified trademarked product for authenticity of supply
15	Guarantee /Warrantee for two years with service and spares available for next 6years
16	Should be supplied with circuit so as to connect Oxygen Cylender to Nebulizer so controlled Nebulizaion and controlled Oxygen can be given at the same time
17	Rates for Nebulization Kit (2 Nos Latex Pipes with Connector,Mask adult & pediatric, and mouth connector for nebulization by mouth) ,Ultrasonic Crystal ,Medicine cup should be separately quoted

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Technical Specification for: Non-Invasive Cardiac Support Pump Integrated with Defibrillator

1. The unit should produce consistent chest compressions with no interruptions.
2. It should be easy to use for in- hospital and out of hospital during Emergency mainly during transportation.
3. It should be able to provide both 30:2 OR continuous compressions, user selectable by simple pressing of button for switching to either mode.
4. Should be able to provide uniform distribution of load on chest by circumferential compression of chest.
5. The chest compression band should have an ability to do high quality compressions.
6. It should have ability to automatically determine the patient compliance (automatically measures size and resistance of each patient chest) and produce compression force accordingly.
7. It should have facility to provide chest compression to patient even when patient is inclined and being transported from staircase at 45 degree.
8. The CPR device should be battery operated with an extremely simple user interface.
9. It should have a LCD back-lit screen display to show compression modes and battery charge status.
10. The battery should be able to provide continuous compression for a minimum 20 minutes when fully charged.
11. The system should be provided with three (03) lithium ion rechargeable batteries, one (01) battery charger and three (03) LifeBand (load distributing bands).
12. The unit should come with an integrated defibrillator for providing synchronized shock while the device is working i.e. without interrupting the compressions.
13. The defibrillator should have ability to measure chest compression rate and depth in real time and provide both visual and optional audible feedbacks.
14. The defibrillator should be rugged and tough with easy to read tri-mode display in any environment

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15. The defibrillator should have ability that all CPR data can be recorded and reviewed by using software specially designed for doing this. (If needed, necessary software should be provided.)

16. The defibrillator should have ability to filter out CPR artifacts and allowing person to see organized rhythms without interrupting chest compression.

17. The Defibrillator should have facility for ECG Monitoring, defibrillation, rectilinear external pacing (transcutaneous) & recorder.

18. Should be supplied with 5 pair of multifunction pads.

19. The Defibrillator should have rectilinear biphasic technology, having energy selection of 1-200 joules.

20. The Defibrillator should have charging time of unit should be less than 7 Seconds to the maximum energy.

21. The defibrillator should have the option to upgrade to EtCO2, SpO2, NIBP and 12 leads ECG.

22. The cost of all spares/accessories and consumables (including those required for up-gradation) should be mentioned in the financial bid.

23. Complete unit, including defibrillator should be US FDA approved.

24. The whole equipment (excluding load distributing bands and pacing pads) will be under comprehensive warranty. No other exclusions will be entertained.

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TECHNICAL SPECIFICATION PATIENT WARMING SYSTEM

Warming system for seriously hypothermic patients able to maintain patients body temperature consistently in the Operation room, ICU to reduce shivering, provide the earlier return of homodynamic stability and lesser a patients drug requirements. It applies sufficient heat to the skin surface to raise body temperature by 2.5°C per hr.

- Arched blanket design - huges patients and transfers heat to as much as 70% of the body surface area.
- Central Manifold – director heat to core of the body and ensure even temp. from head to toe.
- Provide even temp. across the blankets and patient.
- Light weight over patient fit-safe warming avoids tissue damaging.
- Variety of blankets is available such as UPPER BODY, LOWER BODY, FULL CHEST ACCESS, MULTI ACCESS FOR adults/Infants/Cub blankets.
- Absolute heat transfer – 49 watts.
- Weight 11.5 Lbs/5.2 Kg.
- Temp. range-Ambient to 110°F. Max. filter – High efficiency 2 Micron filter.
- Can also be used for Fluid Warming/Blood Warming
  Easy to manage lengths of hyperallergenic, Pressure sensitive tape

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Technical Specifications for Infant, Paediatric and Adult Ventilator

- Should be suitable for use in Infant, Paediatric and Adult patients in all critical care areas.

- Should be an upgradeable design with software/hardware upgradeability for new/future functions

- Should have both invasive and non invasive ventilation modes. Non invasive ventilation should be possible in all modes from control to spontaneous.

- The ventilator should have minimum internal battery backup of 45minutes with onscreen battery power indication. The internal battery should also power the internal air source.Additional batterybackup should be available for 4 hours (may be offered separately) and should be flush mounted on the trolley.

- Should have an integrated internal air source such as turbine:
  - for delivering continuous flow upto 180 lpm.
  - The air source should be powered by the internal battery for at least 45 minutes.
  - The air source should have integrated dust filters which should be easily removable and washable
  - Bacteria filters for delivering medical grade air should be integrated in the turbine

- Integrated 12 inch colour touchscreen
  - display of 3 curves – pressure, flow, volume curves – the curves should be filled curves for easy viewing at a distance.
  - Easy configuration of numeric parameters as per user choice
  - There should be a day/ night mode for easy viewing at night.

- The ventilator should have extremely sensitive valve with response time ≤ 5 msec for ensuring quick delivery of gases during spontaneous breathing (proof of same to be shown in technical data sheet)

- The ventilator should have a simple pneumatic nebuliser which should be inspiration synchronised and volume compensated. This should be supplied as standard scope of supply.

- The ventilator should have low operating costs with a permanent/ non consumable O2 sensor for FiO2 monitoring. Same should be offered as standard. In case consumable/ electrochemical O2 cells are offered by a vendor, same should be provided free of charge for operational lifetime of equipment.

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- The ventilator should be supplied with heated servo controlled humidifier F&P MR850 with suitable hoses for adults and paediatrics. Same humidifier – MR850 - should be suitable for both invasive and non invasive use.

- Flow sensor :
    - The flow sensor should be of heated wire type for higher accuracy.
    - It should calibrate within 5 seconds and without necessity to disconnect from patient.
    - It should be easily replaceable without disassembling the machine or disassembling the expiratory valve
    - At least 10 No.s flow sensor should be supplied for the lifetime of the equipment.

- For highly infectious diseases, disposable patient hoses, disposable expiratory valves and disposable HMEs for adults and paediatrics should be offered as per scope of supply.

- The ventilator should have the following ventilation modes as standard with quick touchscreen based operation / change from one mode to another:

    - Volume Control – Control, Assist Control, SIMV with/ without Pressure support
    - Sigh – pressure oriented sigh to avoid volutrauma/ barotraumas and should be adjustable above the set PEEP.
    - CPAP with/without Pressure Support
    - PC-BIPAP – Biphasic (and not Bi-Level) with/without Pressure Support with spontaneous breathing at two pressure levels. Should be one pressure mode from intubation to extubation
    - AutoFlow or equivalent for delivering tidal volume within a set PIP ; should be possible to combine in all volume control modes and should allow spontaneous breathing in all volume controlled modes
    - Apnoea backup ventilation mode with adjustable tidal volume and rate
    - Non Invasive Ventilation
        - Should be possible to be used in all modes – from control to spontaneous
        - Should have leakage compensation upto 100% of tidal volume
        - The alarm limits and compensation criteria should get modified based on selection of Tube / Mask ventilation mode for all the modes
        - The unit should be supplied with Face/ nasal Masks with gel cushion for face, adjustable cushion pad for nasal bridge and magnetic connectors for quick fastening
        - The mask should be non vented type for use in a dual limb circuit and preferably from same vendor.

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- Should have BTPS compensated settings for :

Tidal Volume in Volume modes	20 ml to 2000 ml
Peak Inspiratory Pressure	1–99 cmH2O
CPAP/PEEP /Intermittent PEEP	0 – 35 cmH2O
Inspiratory Rate	2– 80 bpm
Inspiratory Time	0.2 – 10 sec
Flow acceleration	5 – 200 mbar (to deliver continuous peak flow upto 180 lpm)
Flow Trigger	1 – 15 lpm
Pressure support	0 – 35 cmH2O
Manual Inspiratory hold	0 – 15 sec
Sigh (Pressure oriented)	0 – 35 cmH2O, every 3 minutes for 2 cycles
FiO2	21 - 100%
Apnoea alarm timing	15 – 60 seconds
Automatic altitude compensation	700 – 1060 hPa/ mbar/ CmH2O/

Should have BTPS compensated real time monitoring of:

- Pressure - Peak, Plateau, Mean, CPAP/PEEP
- Tidal Volume - Set (Inspired) , Monitored (expired), leakage compensated inspiratory measured tidal volume
- Minute Volume - Total, spontaneous
- Frequency/ Rate - Set (Inspiratory), Spontaneous, total, I:E Ratio
- FiO2 measured
- Airway Temperature (if active humidifier is used)
- Lung Mechanics - Resistance, Compliance

- Should have three level (Advice- Caution – Warning) ISO alarm management with different audio visual color coded alarms, including corrective help messages on the screen for :-
  - High/low Pressure
  - High/low Minute Volume
  - High Rate
  - High Tidal Volume
  - Apnoea / apnoea alarm time
  - High/low O2 % (automatic settings)
  - Oxygen line failure
  - Technical error (with error code)
  - Incorrect / abnormal settings – with warning message

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- Scope of supply should include
  - Basic Unit(220 - 240 V)with integrated 12 inch touch screenand integrated internal battery to power internal turbine
  - Modular corrosion free Trolley - should be imported , of same make as the quoted brand and no local substitute will be accepted/ should be offered.
  - Servo controlled humidifier MR850 for both invasive and non invasive use with 1 set reusable Silicon Hose set for Adults,1 set reusable silicon Hose set for children with chambers for adult and pediatric patients.
  - Heated Flow sensor - 10no.s
  - Reusable autoclavable expiratory valve - 2 No.s(1 on machine and 1 on standby)
  - O2 cell – should be non consumable and life long
  - Disposables :
    - Disposable Adult hose set – 50 No.s
    - Disposable Pediatric hose set – 50 No.s
    - Disposable Adult HMEs for use from 200 – 1500 ml
    - Disposable pediatric HME for use from 50 – 200 ml
    - Disposable expiratory valves for use with the machine – 20 No.s
  - Oxygen connecting Hose – 3 meters
  - Nebuliser – pneumatic , inspiration synchronised and volume compensated
  - Hinged arm Support for patient circuit – should be imported , of same make as the quoted brand and no local substitute will be accepted/ should be offered
  - Integrated RS232C Interface
  - Test Lung – preferable from same vendor
  - Instruction Manual

- Quality Standards and Support requirements
  - The offered unit should have CE/FDA certificate
  - The unit should comply with relevant IEC Certification, Environmental conditions, Electromagnetic compatibility ICE/EN 60601-1-2
  - Indian subsidiary/ dealer should have nationwide network, support offices and must be also ISO 9001 certified.

- Optional equipment/ features to be quoted indicating separate price –
  - Low Pressure Oxygen – LPO
    - Connection for use with low pressure source such as Oxygen concentrator
    - O2 flow 0.5 – 10 l/min
    - Connecting hose nozzle 6 mm diameter

  - Extended battery pack
    - Up to 5 hours of operation
    - Suitable for conformal fit on trolley

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Technical Specifications for Multipara meter Monitor

1. Should be suitable for adult, paediatric neonatal patients monitoring.
2. Should monitor ECG, Respiration, NIBP, SpO2, Dual Temperature, Dual IBP as standard
3. Should have ST analysis, Arrhythmia detection, pacer spike detection, Drug Dose Calculation and OxyCRG as standard in every monitor
4. Should have integrated 15'' or above TFT-LCD colour touch screen display (resolution min 1024*768) with minimum 10channels of waveforms.
5. Defib and ESU protection should be present
6. Should have monitoring, surgery and diagnostic mode of monitoring
7. Should have Advance Arrhythmia monitoring for Asystole, Vfib/Vtac, VT>2, Couplet, Bigeminy, Trigeminy, R on T, PVC, Tachy, Brady, Missed Beats, IRR, PNC, Vbrady.
8. Monitor access should be with Touch screen, rotary knob and fast access key for quick function.
9. 120 hrs of trend and 60 events with waveform as standard in all monitors
10. Color or position of waveforms or parameters should be able to be adjusted based on users preferences. Big font on screen format should be present.
11. Nurse call, VGA output port should be standard in every monitor.
12. Monitor should have USB port for software upgrade
13. Should have inbuilt three channel recorder as standard in every monitor
14. Should have 2hrs (typically) of battery backup as standard in every monitor
15. Should be European CE complying to European Directive 93/42/EEC for both Monitor and software to control physiologic monitoring systems.
16. Wired networking should be standard to connect to Central station.
17. Upgradeable to Mainstream EtCO2, Automatic Agent identification Anaesthetia Gas monitoring module with MAC value.
18. Anti left lock facility should be possible for better hospital asset management

Should have following parameters

ECG

- Monitor should have capability for display upto 7Lead .
- ST Analysis
- Waveform Freeze option with review of 120 sec
- Range: 15 to 350bpm

RESPIRATION

- Through impedance pneumography method or EtCO2

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SpO2

- Should provide value for arterial oxygen saturation as well as plethysmographic pulse waveform

NIBP

- By oscillometric principle of measurement.
- Should display Systolic, diastolic, mean pressure in large easy to read display
- Range: 10 to 270mmHg

Dual Temperature – core & skin. Range: 0 to 50 Deg C

Dual IBP – Should include Starter kit and simultaneous monitoring of dual temp and dual IBP should be possible. Range: -50 to 300mmHg

Following upgrades should be offered as options – (Quote unit prices in price bid)

1. **EtCO2** – Mainstream EtCO2. Should be supplied by sensor and adaptor. Range: 0 to 150mmHg

Scope of supply must include:

- Basic unit with ECG, Resp, SpO2, Dual Temp, NIBP, Dual IBP, inbuilt battery, Inbuilt three channel recorder – 1 no
- 5 lead ECG Cable – 1 no each per monitor
- SpO2 finger sensor – 1 no per monitor
- Skin temperature probe – 1 no per monitor
- NIBP Hose - 1no per monitor
- Adult & Paediatric cuff – 1no each per monitor
- Should be supplied with intermediate IBP cable– 2no per monitor
- Paper rolls- 4no per monitor
- Instruction for Use per monitor

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TECHNICAL SPECIFICATION FOR XENON LIGHT SOURCE

Xenon Single Port

Specifications:

Xenon 300 watt lightsource with ACMI, Wolf, Storz and Olympus ports:
Dimension : 15"L x 12"W x 5"H
(381mmL x 305mm W x 127mmH)
Weight: 21 lbs (9.5 Kg.)
Power Input : 100~240 VAC 50-60Hz
Circuit Protection: 6.3 A 250V
Classification IEC 601 Type CF, Class 1
Safety Compliances: UL 2601-1, IEC 601-1, and CAN/CSA C22.2 NO.601.1-M90, ETL
Color Temperature : 6000 Kelvin
Replacement Lamp Drawer: 400615

Features should be:

- Removable Lamp Module
- Lamp Age Meter
- Variety of Rotary Turrets with Four Ports
- 650 hr. Lamp Warranty
- Intensity Control Knob

Benefits should be:

- Simplifies Lamp Replacement
- Tracks hours of lamp use to indicate replacement
- Ability to attach a variety of headlights, instruments or endoscopes.
- Long Lamp Life
- Dependability
- Control the amount of light desired

Includes:

- Head Band (Light Weight)

Head Band Spot Module, Black Bag

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Technical Specifications for Nurse Call System

Display & Control Unit:	
Product Spec	Dimensions in mm: Control Unit - 340(L) × 222(W) × 52(H) (mm) Display Unit - 255(L) x 198(W) x 32(H) (mm)
Capacity	Up to 24 Bed Units
Display	7 Seg LED Display Max. 3 Digits for One Bed.
Power Requirements	AC 230 V 5 Amp 50 Hz Power Supply Operating Temp 0°C - 50°C (32°F - 122°F) Operating Humidity 10% - 90% without congealment
Power Consumption	Operating Voltage: DC12V Operating Current: <200mA Standby < 30Ma Full Load < 35mA Startup Current: <200mA Speaker(Full duplex) Impedance: 8Ω±15% Max Output Power: 0.5W Distortion Rate: 5%MAX Max dB: 89 ±3dB Frequency Range: 50Hz ~10KHz
Packing Contents	Display & Control Unit DC12V 1A Power Adaptor
Bedside Calling Unit	
Product Spec	Dimension: 85(L) ×85(W) × 15(D)(mm)
Handset	2 Meter Wired Handset With Jack
Door Unit	
Product Specification	Dimension: 85(L) ×85(W) × 30(D)(mm)
Light Indicator	Blue LED – Continuously ON Red LED – When Patient Call
Packing Contents	Door Unit , Bed Unit, Handset Fasteners

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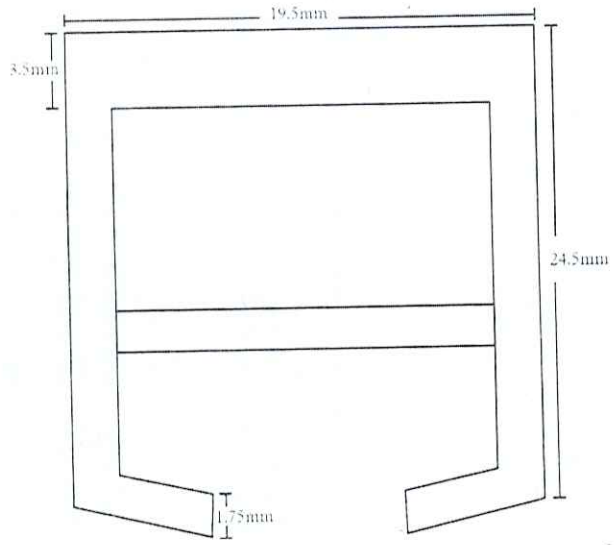
Technical Specification for Hospital Cubicle Track System

A Cubicle track system with all the supporting accessories & curtains.

Cubicle track: The rigid high grade aluminium Track Section (Size - 19.5mm x 24.5mm) with 50 microns thick powder coating finish in white colour finish Thickness-1.75mm & 3.5mm as shown below :



B Supporting Accessories :

(i) **Roof Clamps:** Rigid Aluminums pipes (with upper Bush, Lower Bush & Cap of Upper Bush) of 13.5 diameters in white powder coated finish. Thickness 1mm. Roof clamps are used to provide support to the track from ceiling.

(ii) **Wall Brackets**: Wall Brackets are strong Teflon Fabricated with white powder coated finish. Wall brackets are used to provide support to the track on the wall.

(iii) **Bridge Clamps:** Rigid Aluminums angle (Size - 19.5 mm × 24.5 mm). Thickness - 1.70 mm with white powder coated finish. .Bridge clamps are used to connect two tracks with each other. Bridge clamps also cover terminal point of a track at bend of other track. In this way, bridge clamps also give aesthetic look to Cubicle Track System.

(iii) **Bends:** Bends or curves are provided in the single price of track as per measurement to cover the whole bed & to make movement of runners hurdles free.

(ii) **Runners Hooks**: Small roller wheels with hooks which makes movement of curtain easy

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& smooth

C **Curtain:** Made of premium quality stain Retardant fabric with high quality fabric net of "18 or 24" on top.

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Technical Specification for BladeBox

Single Handed Scalpel Blade Removal Device for 100 Blades

19/08/19
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