ACU/AUTY/Cath lab/Tender/ 1696 /2019-20 **Date:** 27 DEC 2019

TENDER NOTIFICATION

Adichunchanagiri University is inviting Closed tenders for the supply of cardiology equipment for the department of cardiology from the competitive firms.

1	Name of the work	Supply of Cardiology Equipment for the Department of Cardiology
2	Tender documents available for download	26.12.2019 to 10.01.2020 up to 5:00 PM

Sl. No.	Requirements for Cardiology	Quantity (In No's)
	Cardiology Equipment	
1	Flat Panel Cath Lab With Stunt Boost And Required Standard Accessories	1
2	2-D Echocardiography Colour Doppler System	1
3	Anaesthesia Workstation	1
4	Cath Lab Instruments	1
5	Defibrillator With Cardiac Monitor	2
6	ECG Machine	2
7	IABP Machine	1
8	Simple Multipara meter Monitor With Stand	5
9	Syringe Pump – Mid End	10
10	Temporary Pacemaker – Single Chamber	2
11	Ventilator	2
12	Celling Drop For Cath Lab	1
13	Stainless Scrub Station	1
14	Transport Monitor	1

Note: Kindly send quotes in 2 bid format (Technical and Financial Bid sealed separately)

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1. FLAT PANEL CATH LAB WITH STANDARD ACCESSORIES

Department: - Cardiology, Neurosurgery and Interventional Radiology.

TECHNICAL SPECIFICATIONS

System Description:

1) Gantry:
   a) Ceiling/Floor suspended gantry free better maneuverability. Facility for motorized positioning/rotation of stand from the floor base/ceiling pivot by +/-90 degrees for improved workflow and for ease of operation from both left and right side of the patient in addition to zero degree normal head end position. Patient access should be possible from either left or right side.
   b) Gantry should move at 18 deg/sec or higher rotation speed with non-contact sensing mechanism (no collision protection switches). Gantry rotation/ angulation +/- 120 deg and +/-45 deg respectively.
   c) Storage and recall of 2 gantry positions for PTCA should be possible. Gantry depth should be 105cm or more for better groin access.
2) Table: Motorized up/down, free floating 4 way table top, least radiation attenuation, at least 200kgs + at least 100kgs of additional weight for resuscitation in the metal free overhang area without having to retract the table back on its bas.
3) Detector:
   a) Flat Detector of latest generation of minimum 12 inch size diagonally, 1024 x 1024 at 16 bits acquisition.
   b) 3 formats of zoom
   c) DQE of the entire detector: Not less than 75% higher preferred: pls specify spec.
   d) Min pixel pitch < 154um or lower preferred for better resolution.
4) Image Processing & storage:
   a) Minimum 100,000 images on line in 1024 X 1024 matrix with 10-bit storage immediate replay to be available in the main system hard disk (not reckoning the storage space in the CD station).
   b) Images can be acquired at 3.75/7.5/15 images per second speed both in fluro and cine acquisitions.
   c) Pulsed fluoroscopy should be available at above frame rates.
   d) Clinically validated QCA online in the exam room. It should be possible to do QCA from tableside.
   e) It should be also possible to do QCA in the console room.

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f) System should be capable of virtual collimation of the shutters and wedges in the last image to reduce the x-ray dose.
g) System should be capable of measuring and displaying patient dose.
h) System should capable of storage and display of dynamic fluro sequences.
i) System should be capable for printing/sending dicom images on to a dicom printer/laser camera.
j) Lower frame speeds of 1,2,4 or 6 images/sec for carotid/renal/abdominal aortic applications:
k) True On-line DSA at above selectable frame speeds.
l) System should have road-mapping facility wherein subtracted roadmap is superimposed on live fluoroscopy.

5) X-ray Tube :
   a) A noise-free, oil cooled, rotating anode x-ray tube with spiral groove bearing and liquid metal lubricant for faster cooling should be provided.
   b) Anode Heat Capacity: Anode Heat Storage should be at least 3.5 MHU or more.
   c) Cooling rate or heat dissipation in kW should be at least 8,000W: Highest preferred.
   d) Additional beam filtration of at least 0.9 mm Cu equivalent. Different filter sizes protocols to be freely selectable by cardiologist at the tableside. The filters should not reduce in thickness with increase in patient thickness or in deep angulation.
   e) X-ray tube should have secondary grid switching to reduce harmful soft x-rays to patients and Drs.
   f) System should be capable of delivering minimum 3200W continuous fluoro power.
6) Monitors:
   a) 18" LCD-TFT Monitors in exam room for live and roadmap images in exam room with monitor suspension movement across either side of the patient table as well as head/foot end.
   b) The monitor carriage should have motorized up/down movement for fixing the monitor at eye level.
   c) TFT Monitor for live image review in control room.
   d) An additional monitor for patient database is must for user-friendly patient entry without inhibiting live fluoroscopy viewing on slave monitor.
   e) System should have facility to do rotational Angiography where in the gantry can automatically rotate 90 degrees or more while doing parallel acquisition. The rotational scan speed should be minimum 55deg/sec.

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f) It should be possible to do automatic dual axis rotation wherein both rotation and angulation movements are combined in one single scan trajectory to reduce the x-ray dose and contrast required for doing an angio procedure.
g) Better Stent Viewing HW and SW to significantly improve localized stent visibility in addition to any inbuilt software for stent visibility improvement.
h) Stent viewing SW should have capability of showing fade-in fadeout of lumen for better stent visibility in relation to coronary artery wall.
i) Table side menu-driven with all software including Stent-boost facility.
j) System should have ability to record DSA runs on the CD and the embedded viewer should support review of these DSA runs at referring physician's PC.
k) Doctors, Nurses and operators training at site by specialist from supplier.
l) Remote service control with on-line facility nodal point in India.

7) Integrated Hemodynamic Recorder- Minimum 2 invasive pressures and 3 channel ECG, with SPO2, NIBP, respiration and Cardiac output measurements with accessories 2 sets along with A4 Size printing facility. It should have a display on the monitor carriage. Recording facility to be standard.
8) Ceiling and Table mounted shields, Arm Support.
9) Two way microphones with speaker system.
10) Examination lamp-230V, Ceiling mounted, Working distance 70cm to 140 cm Luminance:50000, Light Body diameter:22cm.
11) Continuous auto-push of images.

THIRD PARTY ITEMS REQUIRED FOR FLAT PANEL CATH LAB

Sl. No	Description	Qty
1	Single Head Pressure injector with 200 Syringes(50ml)and should be CE approved	1 NO
2	Lead Glass (2m*1m) and should be FDA/CE approved	1 No
3	120 KVA UPS for the complete systems as per tender requirement with 30mins back-up	1 No
4	Lead Aprons Wrap Around and should be CE approved	6 Nos
5	Lead Aprons Non Wrap Around and should be CE approved	6 Nos
6	Thyroid shield	6 Nos

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7	Lead Eye Glasses and CE approved	6 Nos
8	Automated Clotting Time(ACT) High Range Activated Clotting Time: 50 cartridges Low Range Activated clotting Time: 50 cartridges Heparinase Test Cartridge:20 cartridges Recalcified Activated Clotting Time: 50 cartridges General purpose cartridge(GPC):50 cartridges Actuator cleaning kit Each	1 set
9	Hem oximeter with O2 saturation system	1 No
10	Bi-phasic Defibrillation/Monitor/Recorder with AED, transcutaneous Pacing.SpO2, NIBP & ETCO2 monitoring parameters and internal paddles Accessories: Paid of Adult External Paddles with integrated pediatric paddles-01 No. 3 lead ECG cable-03 nos Lithium ion battery – 01 no Recorder Paper roll – 01 no	1 No
11	Color Laser printer for hemodynamic monitor(HP) or equivalent	1 No

2. 2-D ECHOCARDIOGRAPHY COLOUR DOPPLER SYSTEM

TECHNICAL SPECIFICATIONS

1. Should be a standalone system integrated on a light weight mobile cart.
2. The system should be a color Doppler Echocardiography all digital beam former system to study the anatomical abnormalities and blood flow in the heart and associated vessels. Should be a standalone system integrated on a light weight mobile cart.
3. Should be a latest generation Electronic Phased array Color Doppler system with minimum 512 Electronic independent channels.
4. Should have 256 gray shades for sharp contrast resolutions.
5. Should be supplied with adult and pediatric cardiac and vascular probes of wide band transducers without frequency selection for higher sensitivity of response over a broad frequency range of operation.
6. Should have 2D, M-mode, Anatomical M-mode, Color M-mode, PW and CW Doppler, Steerable CW Doppler.
7. The system should have a very high dynamic range of at least 200dB to pick up subtle echoes.

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8. Should have three active ports.
9. Should have 2-4 Mhz broadband phased array sector probe for adult cardiac imaging.
10. Should have 3-8 Mhz broadband phased array sector probe for paediatric and neonatal cardiac imaging.
11. Should have 3-12 Mhz broadband Linear Array probe for vascular imaging.
12. Should have multi frequency convex array probe 3-10 MHz for paediatric imaging
13. Pencil probe (optional)
14. Should have advanced tissue Harmonic Imaging.
15. Should have color flow imaging.
16. Should have color Tissue Doppler Imaging.
17. Should have gain control in Axial Plane.
18. Should have triple imaging possibility on the system.
19. Should have PW/CW Doppler facility in all imaging phased array sector probes.
20. Should have 15" or more high resolution TFT monitor with tilt and swivel facility and should be able to view in all angles and all light conditions.
21. Should have greater than 5000 images in the system hard disk drive
22. Should have in built CD/DVD writer.
23. Should have patient reporting page with embedded images.
24. Should have full functional measurement facility and calculation should be possible.
25. Should be supplied with thermal printer and 6 packs of thermal paper and the unit should have option to connect external printer.
26. Unit should function with 200-240Vac, 50/60 Hz input power supply.
27. Unit should be supplied with suitable UPS with a minimum 30 minutes back-up time.
28. Should have safety certificate from a competent authority CE / FDA (US) certificate. Copy of the certificate / test report shall be produced along with the technical bid.

3. ANESTHESIA WORKSTATION

TECHNICAL SPECIFICATION

1. General Requirement

a) Compact and modular, three gas Anesthesia workstation with an integrated ventilator for adult to infants and integrated airway monitor for airway pressures and volume.
b) The machine should be suitable for low and minimal flow anesthesia application with compliance compensation of breathing ckt, fresh gas flow compensation/ decoupling.
c) The machine should have 3 drawers.

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d) Should have interactive guided system test.
e) Should have precise digital fresh gas settings of Air, N2O and O2, with a total fresh gas flow meter for indication.
f) Should display virtual flow tubes.
g) The anesthesia machine, inbuilt ventilator, vaporizer and patient monitor should be manufactured by same company to maintain uniformity of part and efficient after sale service.
h) The system should have upto 2 Hrs. battery backup
i) System should be US FDA/ European CE approved and confirms to EN 60601-2-13 (Requirement for safety and essential performance of anesthesia system)
j) Should have Integrated LED workplace illumination.
k) The machine should have highly maneuverable trolley with a central brake
l) Should have integrated anesthesia gas monitoring module with automatic identification of agent with values display on patient monitor including MAC value.

2. Gas delivery system

a) Should have pin index yokes for Oxygen & Nitrous Oxide besides separate connection for Central gas supply for Oxygen, Nitrous Oxide and Air.
b) 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.
c) The system should be suitable to use at minimal flow upto 700ml fresh gas setting.
d) Automatic cutoff of N2O by Oxygen pressure failure.
e) Hypoxic guard for linear regulation of minimum oxygen concentration at 23% volume
f) To ensure patient safety minimum Oxygen flow of 200 ml at low fresh gas flow settings even below total 500 ml fresh gas flow.
g) Audible visual oxygen failure alarm.
h) Emergency Oxygen flush at 30 – 70 L/min bypassing the vaporizer.
i) In the event of complete power loss and battery failure it shall be possible to manually ventilate and deliver anesthetic agent.

4. Vaporizer

a) Machine should have possibility to mount 2 quick mount type vaporizer for easy interchangeability and safety with interlock facility.
b) Vaporizer for Isoflurane & Sevoflurane.
c) Vaporizer should have extended delivery range from 0 to 6 Vol. %
d) The vaporizer should require no calibration in its life time.

5. Breathing System

a) Should have fresh gas de-coupled semi closed circle absorber system.
b) Should have adjustable pressure relief valve from 5 to 75 mbar.
c) Should have change over from Spontaneous to Bag ventilation with single step.
d) The system should have leak and compliance test (including patient hoses upto the Y piece).

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e) Should have compact breathing system with approx 1.7 Ltr. Volume capacity.
f) Should have an external fresh gas outlet for connecting Magill or Bain's circuit The system should have integrated breathing system warmer to prevent condensation in breathing system and patient comfort (to prevent delivery of dry fresh gases to lungs or mucocilliary transport of fresh gas)
g) The device should have port for anesthesia gas scavenging system.

7. Integrated Anaesthesia Ventilator

a) The system should have inbuilt ventilator with electronically controlled and pneumatic or Piston driven technology.
b) Should not require changing of bellows for adult & infants.
c) Should have color TFT screen.
d) Modes: Manual/Spont, Volume controlled, Pressure controlled, , SIMV/PS,
e) The same ventilator should be capable to be upgrade to pressure support.
f) Tidal Volume : 20 ~ 1400 ml
g) PEEP : 0 ~ 20 mbar
h) Breathing Frequency : 4 to 60 BPM
i) I:E Ratio : 4:1 to 1:4
j) Inspiratory pause : 0 – 50% of Ti
k) Should have Desflurane compensation.
l) Should be able to ventilate with atmospheric air, in case of total gas supply failure.

8. Integrated Airway monitoring and display of following parameters:

a) Expiratory Tidal Volume
b) Expiratory Minute volume
c) PEEP, Peak & Mean and Plateau airway pressure
d) Frequency
e) Waveform display for Airway pressure.

9. Adjustable high/low alarm limits with audio and visual alarms for the following:

a) Minute volume,
b) Airway pressure (incl stenosis and disconnect),
c) Insp oxygen concentration,
d) Audio power supply fail alarm,
e) Fail to cycle warning.

4.CATH LAB INSTRUMENTS

SL.NO	DESCRIPTION	
I	Basin set	1
II	Preparation Set	1
III	Angio Set	1
IV	PTCA Bowls	1
V	Procedure set	1
VI	PPI tray	1

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VII	Suture Removal Set	1
VIII	Catheterisation set	1
DETAILED LIST		
I. BASIN SET CATHLAB		
SL.NO	**DESCRIPTION**	
1	Basin 15"	1
2	Big Bowl 7.5"	1
3	Bowl 6"	1
4	Bowl 5"	1
5	Gallipot Big	1
II. PREPARATION SET CATHLAB		
SL.NO	**DESCRIPTION**	
1	Tray 9" x 6" without lid	1
2	Gauze 30 X 30	1
3	Sponge holding forceps 10"	1
4	Gallipot Big	1
III. ANGIO SET CATHLAB		
SL.NO	**DESCRIPTION**	
1	Tray 9" x 6" without lid	1
2	Towel Clip Backhows 5"	1
3	Needle Holder 6" (bold tip)	1
4	Surgical scissor STR 6"	1
5	Artery forceps CVD 6"	1
6	Artery forceps (MQT/Fine tip/STR) 5"	1
7	Dissecting(Non-toothed) 6"	1
8	Surgical pad	1
9	BP Handle No 3	1
IV. PTCA BOWL SET CATHLAB		
SL.NO	**DESCRIPTION**	1
1	Bowl 5"	1
2	Bowl 4"	1
3	Gallipot Big	1
		1
V .PROCEDURE SET CATHLAB		
SL.NO	**DESCRIPTION**	
1	Tray 9" x 6" with out lid	1
2	Needle Holder 6" (bold tip)	1
3	Artery forceps CVD 6"	1
4	Dissecting(Non-toothed) 6"	1
5	Gallipot Big	1
6	Mayo Scissors 6"/5.5"(CVD)	1
7	BP Handle No 3	1

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VI. PPI TRAY SET CATHLAB (INSTRUMENT TRAY AND INSTRUMENT HOLDER)		
SL.NO	**DESCRIPTION**	
1	BP Handle No 3	1
2	BP Handle No 4	1
3	Dissecting(Non-toothed) 6"	1
4	Dissecting(Toothed) 6"	1
5	Adson Dissecting(Non-toothed) 5"	1
6	Adson Dissecting(Toothed) 5"	1
7	Mayo Scissors 6"/5.5"(CVD)	1
8	Surgical Scissors 6"(STR)	1
9	Metzenbaum Scissors 6"(STR)	1
10	Metzenbaum Scissors 6"(CVD)	1
11	Artery forceps CVD 6"	1
12	Artery forceps (STR) 6"	1
13	Artery forceps (MQT CVD)	1
14	Artery forceps (MQT,STR)	1
15	Allis Tissue forceps 7"	1
16	Right angle forceps 6"	1
17	Right angle forceps 8"	1
18	Needle Holder 6" (bold tip)	1
19	Sponge holding forceps 10"	1
20	Self retaining retractor	1
21	Langanbeck retractor(Medium)	1
22	Langanbeck retractor(small)	1
23	Cats pow	1
24	Towel clip-Backhaus 6"	1
25	Gallipot-Big	1
VII. SUTURE REMOVAL SET CATHLAB		
SL.NO	**DESCRIPTION**	
1	Tray 9" x 6" without lid	1
2	Artery forceps CVD 6"	1
3	Surgical scissors STR 6"	1
4	Dissecting forceps Non Toothed 6"	1
5	Suture removrer scissors 6"	1
6	Clip remover	1
7	Gallipot-Big	1
8	Gauze	1
VIII. CATHETERISATION SET CATHLAB		
SL.NO	**DESCRIPTION**	1
1	Gallipot-Big	1

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2	Kidney Tray Large	1
3	Spong Holder	1

5.DEFIBRILLATOR WITH CARDIC MONITOR

TECHNICAL SPECIFICATIONS

a) Biphasic, Manual and AED with voice prompt, compact and light weight
b) Energy selection 5J to 200J in steps.
c) Momentary energy selection access on front panel.
d) Should have adult and pediatric paddles integrated on same handle.
e) Momentary charge key on front panel and on the apex hand.
f) Monitor should display selected and delivered energy
g) Should have disarm facility.
h) Energy should be delivered within 30ms after the detected R wave in synchronization mode.
i) Charging time maximum 5 sec for 200J.
j) Should have battery back up for 50 discharges of 200J.
k) Should have ECG inputs through paddles or 3 lead cables.
l) Should have display for selected ECG input source(I, II, III, paddles)
m) Lead off message should appear with alert tone.
n) Amplitude gain of ECG waveform should be adjustable
o) Should have display for heart rate.
p) Should have alarm for high and low HR.
q) Should have an inbuilt thermal recorder.
r) Should have enable/disable option for printer.
s) Should supply 2 bottle of jelly, 12 roll of thermal paper.
t) Should supply three pairs of AED pads
u) Should operate on mains 230V, 50Hz
v) Should have safety certificate from a competent authority CE / FDA (US) / STQC CB certificate / STQC S certificate or valid detailed electrical and functional safety test report from ERTL. Copy of the certificate / test report shall be produced.

6.ECG MACHINE

TECHNICAL SPECIFICATION

	Technical Specification-Multichannel ECG Machine (Various)
1	**ECG Machine – 3 Channel**
1	Simultaneous 3 Channel ECG recording with 12 lead simultaneous acquisition

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2	Should have visual alarm for open lead
3	Should have a digital display of 3 channel ECG
4	ECG Machine should have 3 modes of operation – Automatic, Manual & Rhythm (Not Arrhythmia)
5	Should have a maintenance free digital thermal array printer
6	Printer should work with standard thermal paper(should be available in Local Market)
7	Printer should be able to print ECG report and should have on / off selection
8	Should be compact and portable, and should have carry handle for portability.
9	Should have ECG lead annotation facility
10	Equipment should have sufficient battery backup for taking minimum 100 ECG without AC power
11	Should supplied with2 patient cable sets, 8 clip on electrodes, 12 chest electrode with silicon rubber bulb, 12 packets / Rolls of recording paper & 1 bottle of jelly.
12	Should operate on mains(220v-50Hz) and rechargeable battery (built in)
13	Recording speed should be 25 mm/ sec and 50 mm/ sec.
14	Should have defibrillation protection.
15	CMRR should be >90dB or the Sampling rate should be > 7000
16	Frequency response 0.05Hz to 129 Hz.
17	Should have a digital filter for AC and EMG.
18	Should have safety certificate from a competent authority CE / FDA (US) / STQC CB certificate / STQC S certificate or valid detailed electrical and functional safety test report from ERTL. Copy of the certificate / test report shall be produced along with the technical bid.
II	**ECG Machine 12 Channel**
1	Simultaneous 12 Channel ECG recording with 12 lead simultaneous acquisition
2	Should have visual alarm for open lead
3	Should have a digital display of 12 channel ECG
4	QWERTY Alphanumeric keyboard
5	Built-in ECG Parameters measurements and Interpretation
6	Minimum 40 ECG Storage inbuilt memory.

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7	3 Operating modes: Automatic, Manual and Rhythm
8	Should have a maintenance free digital thermal array printer
9	Printer should work with standard thermal paper (should be available in Local Market)
10	Should have 12 lead ECG preview display before taking printouts and should have printer on/off selection.
11	Should have ECG lead annotation facility
12	Machine should have sufficient battery backup for taking at least 25 nos ECG on a fully charged battery
13	Should supplied with 2 patient cable sets, 8 clip on electrodes, 12 chest electrode with silicon rubber bulb, 12 packets of recording paper, 1 bottle of jelly and 12 nos. reusable button type electrode
14	Should operate on mains (220v-50Hz) and rechargeable battery
15	Recording speed should be 25 mm/ sec and 50 mm/ sec.
16	Should have defibrillation protection.
17	CMRR should be>90dB or ECG machine should have digital processing with atleast 7000 samples per second from each lead wire.
18	Frequency response 0.05 Hz to 150Hz.
19	Should have a digital filter for AC and EMG.
20	Should have safety certificate from a competent authority CE / FDA (US) / STQC CB certificate / STQC S certificate or valid detailed electrical and functional safety test report from ERTL. Copy of the certificate / test report shall be produced along with the technical bid.
21	SHOULD SUPPLIED WITH A SUITABLE TROLLEY WITH FOLLOWING SPECIFICATIONS
	Trolley should made of Stainless Steel / Powder coated frame with SS 304 grade Top
	Should be a 3-shelf (including the top) cart, one with a drawer for storing the accessories and consumables.
	Should have four superior castors (two with brakes)
	Trolley should have atleast 30" height and the shelves should have sufficient space for storing the accessories
	Top shelves shall be surrounded by railing.
	Trolley should have a suitable cable arm firmly affixed having holder for ECG cables while not in use

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7.IABP (intra-aortic balloon pump)

Technical Specification

1. System should be transportable and compact with adequate battery backup
2. System should have faster pneumatics to provide accurate ventricular support enhancing augmentation & Improved after load reduction.
3. System should be capable of automatically selecting appropriate trigger. ie, ECG or pressure and also accurately select the inflation and deflation points in auto mode.
4. Single ECG Trigger should be able to track various ventricular and atrial arrhythmias.
5. The system should automatically detect arrhythmia and adapt the R wave deflation mode accordingly.
6. Should be able to trigger at lower pulse pressure in patients with hypotension in pressure trigger mode.
7. System should start up easy and user friendly
8. Real time display of ECG, invasive blood pressure and balloon pressure wave forms
9. Display should be bright and with good visibility from distance
10. On screen indicator for helium level in the cylinder and battery level.
11. ECG inflation marker to indicate inflation period on ECG which can be useful when arterial pressure waveform is not available
12. On screen indication of standby time.
13. Prompt detection of blood flowing back to the balloon lumen in case of IABP leak
14. Should have facility for condensation removal automatically without user intervention and should be maintenance free.
15. Should provide peripheral vascular Doppler for checking limb ischemia
16. Upgradable to incorporate fiber optic sensor.
17. System should have 4 types of assist ratio like 1:1, 1:2, 1:4 & 1:8 for comfortable veining
18. Should have capability to connect on the hospital network (optional)

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19. Should have valid certifications from the international standards organizations.

20. Should be quoted with a rate contract for supplying balloons for 5 years. The rate offered will be taken for evaluation. The quantity mentioned in BOQ (3per machine each year) is for evaluation purpose only. Rate will be transferred to hospital for future procurement.

21. System should be supplied with the following:

    a. ECG cable with lead wires: 2 sets

    b. Reusable invasive blood pressure transducer: 3 Nos.

    c. Refillable helium Cylinder compatible with the IABP system: 3 Nos.

    d. Intra Aortic Balloon Catheter (Adult Size) : 3 Nos.

    e. Interface cables for connecting with patient monitor : 2 sets.

8. MULTIPARAMETER MONITOR

TECHNICAL SPECIFICATION

1	Should have TFT/LCD display with at least 12 inches with atleast 6 wave forms and numeric display simultaneously
2	The waveforms should be user selectable.
3	Should be portable with carrying handle.
4	Monitor should have in built Lithium-ion type battery for 2 Hrs continuous operation in case of mains failure
5	Should have keys for quick access to main functions.
6	Should be able to monitor ECG, SPO2, NIBP, 2 IBP, Respiration Rate, 2 temp & ETCO2, for adult, pediatric and neonatal patients as standard.
7	Monitor must have facility for at least 2 IBP/IPM/IPM measurements simultaneously.
8	3 or 5 Lead ECG monitoring with lethal arrhythmia recognition capability and ST analysis
9	Respiration & Apnea alarm
10	Manual, Auto and STAT mode for NIBP monitoring and ranges should be 20 to 230mmHg.
11	Pulse Oxymeter (SPO2) with Plethysmogragh &Pulse strength indicator With Variable pitch with change in SpO2.
12	Side-stream / Microstream Capnography with display of CO2 wave form & digital values (ETCO2, FiCO2,RR).
13	Should have separate volume control for beep sound for QRS and alarm sound.
14	The display setting should have at least 4 user defined setups variable as per applications for flexible use of the monitor in various clinical environments

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9.SYRINGE PUMP

TECHNICAL SPECIFICATIONS

1. Should be easy to use and nurse friendly.
2. Should have automatic syringe size and model detection
3. Should have large format LCD/TFT display.
4. Should have a minimum flow rate range from 0.1 – 1200 ml/hr for 50ml syringe, 0.1 – 100 ml/hr for 20ml syringe and 0.1 – 60 ml/hr for 10ml syringe.
5. Syringe range from 20-50/60 ml.
6. Should have a flow rate accuracy of ±2%
7. Should have a bolus rate up to 1000ml/hr for 50 ml syringe.
8. Should have automatic and manual bolus.
9. Should have at least 3 levels of programmable occlusion pressure.
10. Should have automatic bolus reduction system to avoid accidental bolus delivery after occlusion incident.
11. Should have a rechargeable battery with back up time of minimum 3 hours.
12. Pump must triger following alarms with visual indication:- i. Occlusion Pressure Alarm

ii. KVO or 3 min pre- alarm

iii. Syringe empty and volume infused alarm

iv. Internal malfunction and Battery Charge Low Alarm v. Syringe disengaged and incorrectly placed alarm

vi. Alarm loudness control. vii. No mains

viii. Line disconnected (rapid pressure drop).

13. Should work with input 200 to 240Vac 50 Hz supply.
14. Should have safety certificate from a competent authority CE / FDA (US) / STQC CB certificate / STQC S certificate or valid detailed electrical and functional safety test report from ERTL. Copy of the certificate / test report shall be produced along with the technical bid

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10.TEMPORARY PACEMAKER – SINGLE CHAMBER

Technical Specification

1. Should be a Single Chamber Pacemaker (Temporary) for bradycardia treatment before, during or after a surgery.
2. Stimulation burst and permanent stimulation should be available for high pacing rate.
3. Should be compact & easy-to-operate device, particularly suitable for emergency treatments.
4. Safety features, including automatic lead and battery check.
5. Should have continuous monitoring of the battery voltage.
6. Should have transparent cover for parameter protection.
7. Should have shock and water-resistant housing.
8. Should have back up pacing during battery change. 9. Should have Modes AOO, AAI, VOO, VII
10. Should have pacing rate 40-180 ppm.
11. Should have fast pacing (Burst rate) of 80-200 ppm.
12. Should have Pulse Amplitude of 0.1-17V
13. Should have sensitivity 1.0-20mV
14. Should have minimum battery backup > 200 hours.
15. Should have safety certificate from a competent authority CE issued by a notified body registered in European Commission / FDA (US) / STQC CB certificate / STQC S certificate or valid detailed electrical and functional safety test report from ERTL. Copy of the certificate / test report shall be produced along with the technical bid.

11. VENTILATOR ICU

TECHNICAL SPECIFICATIONS

I. Ventilation modes

1. Paediatric mode.
2. Controlled mode.
3. Asst. Controlled mode.
4. Pressure Controlled Ventilation.
5. SIMV/V and SIMV/P.
6. Bi pressure Ventilation.
7. CPAP and PEEP.
8. Facility for Non-Invasive ventilation
9. Plateau Facility
10. Battery Backup-2 to 4 hours

II. Ventilation parameters: -

1. Tidal volume - 200 – 2000 ML (Adult patient). a. 50 to 300 ML (Paediatric PC mode).
2. Respiratory rate - 5 – 100 BPH.
3. Pressure - 0 – 100 cm H2O.

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4. Inspiratory Peak Flow - 4 – 100 1/min.
5. Minute volume - 1 – 30 1/min.
6. Oxygen Concentration - 21 –100 %
7. Inspiratory pause - 0.1 – 5.5 sec.
8. PEEP/CPAP - 30 cm H2O.

III. Standard Accessories (with each machine): -

1. Patient circuit(Adult reusable) - 2 complete set.
2. Patient circuit (Paediatric reusable) - 1 complete set.
3. Nebulizer Ultrasonic one - Complete set.
4. Humidifier - 1 No.
5. O2 Pressure Regulator with hose - 1 No.
6. AIR Pressure Regulator with hose - 1 No
7. 5 meters (conversion kit)
8. Trolly-1

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