# KOLLAM DISTRICT CO-OPERATIVE HOSPITAL SOCIETY LTD NO. Q .952

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## QUOTATION NOTICE

Quotations are invited for the following listed items for new OT & ICU Complex of NS Memorial Institute of Medical Sciences, a unit of Kollam District Co-op Hospital Society Ltd. Q 952, as per the given Terms and conditions and detailed Technical Specifications.

Date of release of quotation : 24/03/2024
Last date for submission of quotation : 02/04/2024

| Sl No | Item | Qty |
|---|---|---|
| 1 | Electro Surgical Unit (Cautery) | 1 |
| 2 | Electro Surgical Unit (Cautery) with Vessel Sealer | 1 |
| 3 | Multipara Monitor-High End | 2 |
| 4 | OT Table | 1 |
| 5 | OT Table with Ortho Base | 1 |
| 6 | Anesthesia Workstation | 1 |
| 7 | Anesthesia Workstation-High End | 1 |
| 8 | Fluid Warmer | 1 |
| 9 | Video Laryngoscope- Handheld | 1 |
| 10 | Flash Sterilizer-Table Top | 1 |
| 11 | Portable Ultrasound | 1 |
| 12 | Neonatal Ventilator with HFOV | 1 |

For Terms & Conditions, List of attachments & Technical Specifications

visit www.nshospital.org

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Tender & Applications

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Quotation for OT & ICU Equipments

You may submit quotation as per the terms and conditions with necessary documents as asked so as to reach us before the cutoff date. Quotations not meeting the Terms & Conditions/Technical Specification/without necessary documents are liable to be rejected. Please note that Management has the right to cancel/ postpone the quotation proceedings without prior notice.

Kollam,
24.03.2024

**Sd/-**
**Secretary**

# TERMS AND CONDITIONS

1. The Model quoted must be latest & most advanced and spares & service support must be available for at least 10 years after installation.
2. All Equipment must have at least US- FDA/ European CE/ EN (IND) ISO 9001 & ISO 13485 unless otherwise specially mentioned in Technical specifications sheet.
3. Demonstration of equipment to be arranged at site for 1 week at least for evaluation of performance and cross checking of Technical specifications. Application specialist & Service Engineer should be present
4. There will be 98% uptime warranty during any contract on 24 (hrs) X 7 (days) X 365 (days) basis. In case of more failure days, will invite a penalty of 2000/-day.
5. All complaints during any contract period should be attended within 24 hours and should be rectified within 48 hours from the time of reporting. In case of failure of Equipment/Accessories/ Instruments standby arrangements must be provided within 48 Hours. Any spares parts during AMC period should be quoted and approval should be acquired from Hospital Management within this 48 hours. Any failure to this will invite a penalty of 2000/-day.
6. Warranty: 3 years from mutually agreed Installation date. Warranty covers entire system in the P.O which includes all kinds of machine parts, accessories, software, services like maintenance, calibration and all software updates etc.
7. AMC & CMC Rate in percentage (of Total purchase value without Tax) should be quoted. Annual escalation if applicable should be mentioned. AMC & CMC rates should be quoted for remaining 7 years after expiry of 3 year warranty.
8. Delivery Time should not be exceeded than agreed time in P.O. Any failure to this will invite a penalty of 1000/-day.
9. Payment as per Hospital policy (70% on delivery, 30% after installation completion & successful 1 month usage)
10. Training: On Site training to Doctors/ Technicians/ staff is to be provided by Principal/ Indian Agents (if they have the requisite know-how) for operation and maintenance of the equipment to the satisfaction of the Institution. Individual training certificates should be provided as hardcopy & softcopy.
11. Comprehensive Maintenance Contract (CMC) includes unlimited breakdown maintenance preventive maintenance including testing & calibration as per technical/ service /operational manual of the manufacturer, labour, spares, all software updates etc. The supplier shall visit each consignee site as recommended in the manufacturer‘s technical/ service /operational manual, but at least once in six months during the CMC period
12. Annual Maintenance Contract (AMC) includes unlimited breakdown maintenance, preventive maintenance including testing & calibration as per technical/ service /operational manual of the manufacturer, labor, all software updates etc. The supplier shall visit each consignee site as recommended in the manufacturer‘s technical/ service /operational manual, but at least once in six months during the AMC period
13. Cost of Warranty/CMC/AMC will be added while Ranking/Evaluation.
14. Care & Maintenance Plan with Instructions for daily, weekly, monthly and quarterly maintenance checklist should be given at the time of installation.
15. In Technical specification sheet, all Technical specifications are mandatory to comply with. However some specifications marked as “Optional” while others are mentioned as “Desirable”. Companies are recommended to comply with both cases if available, otherwise will be considered as non compliance. Non compliance to optional **and desirable items not necessarily subject to disqualification. But if Optional and desirable items might get includedin the final package, preference will be higher for those who comply with.**

## MANDATORY ATTACHMENTS WITH THE BID (TO BE SUBMITTED WITH SIGN & SEAL)

1. Terms & Conditions Page (Page No 1 )
2. Mandatory attachments Page (Page No 2 )
3. All European CE,US- FDA ,STQC CB certificate/ STQC S certificates.
4. Compliance statement with technical specification – Document to state the compliance to Published Technical specifications. Each spec to be addressed and 'Yes' or 'No' to be marked. If any deviations are there, may be stated on the right side.
5. Original Product Technical datasheet – All technical details of the machine (Not sales brochure)
6. Details of service division in Kerala – This should contain addresses of Service centers in Kerala, Total number of service engineers etc. Please also do mention whether the service engineers are of Manufacturer or Dealer.
7. Sales authorization letter from Manufacturer – If the bidder is a Dealer and not Manufacturer then they must submit letter from Manufacturer to prove they are authorized to sell the equipment in our Area.( Manufacturing Company representative should attend negotiation meetings and to acknowledge purchase order later)
8. Details of installations in Kerala with Reference number- Please note that only installation list of same model quoted at NS Hospital (Not total installations of all models of company) is in need.

## TECHNICAL SPECIFICATIONS

### 1 ELECTRO SURGICAL UNIT /DIATHERMY /CAUTERY

1. Micro controller based isolated output Electro Surgical Generator with high PER and high crest factor for coagulation.
2. Should be compatible for Open/Laparoscopic and Liver Resection/Transplant surgeries and supports under water procedures.
3. Should have a provision to interface with ultrasonic and argon gas option in future.
4. Ergonomic and integrated drip proof design with multiple modalities such as monopolar cut, coagulation and bipolar cut/coag.
5. Class I or II and Type CF , defibrillation proof equipment.
6. Universal AC input supply (230 V ± 10 %, 50/60 Hz).
7. Should have Touch screen display for ease of use and should display error alerts also.
8. Recall of most recently used mode and power settings.
9. Provision to store programs
10. Feedback microcontroller mechanism to ensure patient safety which has automatic and

**continuous impedance measurement system during procedure to produce consistent clinical tissue effects andadjust the energy output accordingly**

11. Alarms : Activation tones and alarm tones , activation tone volume can be adjusted.
12. Modes
    a) Cutting : Low, Pure, Blend
    b) Coagulation : Fulgurate, Dessicate, Spray, Soft
    c) Bipolar modes : Precise, Standard, Macro

**In case of any other modes/equivalent modes please specify.**

13. Should have power settings as Monopolar cut ≥ 300W, coag ≥ 100W and Bipolar ≥70W and have seperate foot switches for monopolar and bipolar modes.
14. The unit should be provided with suitable power cords and should be compatible with Indian standard wall socket.

15. The perfomance of the unit should not be affected by electro-magnetic interference radiated or conducted through power lines from another device.
16. The working of the equipment should not interfere with the functions of other devices especially Multipara Monitors.
17. Mandatory CE/US-FDA certification.
18. Standard accessories should be supplied ad follows
    a. Color coded pedal water proof foot switch for monopolar-1
    b. Bipolar Footswitch-1
    c. Suitable trolley should be supplied along with the unit
19. Should be compactable with three button monopolar pencil which can be used to adjust the power output of the machine from the sterile field itself.
20. Should have Split Type Patient Plate contact quality monitoring System for Maximum Patient Safety (Unit should not be delivering power until and unless maximum area of the patient plate is attached to patient body to minimize the risk of post-operative cautery burns)
21. Quoted Rate in Quotation should be a split-up as
    a. Basic ESU unit with vessel sealing
    b. Bipolar Footwitch
    c. Monoolar Foot switch
    d. Universal adaptor for single lead monopolar electrode
    e. 3pin Monopolar lead (Pencil) with handswitch
    f. Patient pads with return electrode monitoring

**2 ELECTRO SURGICAL UNIT /DIATHERMY /CAUTERY WITH VESSEL SEALING**

1. The system should have monopolar cut & coagulation, bipolar and vessel sealing modes integrated into one unit.
2. The equipment should have microprocessor based device incorporating closed loop control for all output modes.
3. The equipment should incorporate tissue sensing technology on real time basis and it should have the technology to convert electrical energy or radiofrequency energy thus providing radio frequency seal. It should identify the tissue type and adjust power accordingly to get desired surgical effect on various tissue types.
4. Should have bipolar saline resection facility
5. Low frequency leakage as per IEC standards.
6. Should have following alert tones
    a. Patient pad monitoring error alert
    b. Reactive and regrasp/improper regrasp error alert
    c. Instrument checking alert
    d. Complete and incomplete seal alert separately, distinguishable audible alarm
    e. Malfunctioning/system error alert
7. The equipment should have maximum power efficiency ranging from 99-100%
8. Monopolar cutting should have at least two cutting modes
    a. Pure cut for clean precise cut, maximum power 300W or above
    b. Blend for cutting with hemostasis, maximum power–200to300W
9. Monopolar coagulation should have at least two coagulation modes
    a. Fulguration or equivalent mode for efficient non-contact coagulation with maximum power 120W
    b. Spray mode should have varying amplitude & frequency for coagulating large tissue areas with minimum depth of necrosis
10. System should be integrated with all necessary modes of instruments for various surgical procedures

11. Should have twin monopolar sockets with independent power setting. System should have one universal adapter for footswitch operation & one bipolar socket
12. Should have recall facility to recall last setting of user
13. Should be compatible with argon machine.
14. Should have auto bipolar start and stops where users can set the auto-start delay time and auto stop impedance function.
15. Should have digital indication for power setting, touchscreen/ touchpanel display for monopolar, bipolar & vessel sealing technology.
16. Vessel sealing system should have user control mechanism so that surgeon can decide for a repeat seal before cutting it or even not cutting it (No auto cut)
17. The system should be able to seal vessels or tissue bundles preferably within 2 to 4seconds.
18. Vessel sealing system should be able to seal artery, veins up to and equal to 7mm, sealed vessels should withstand up to 3 times the systolic blood pressure
19. Thermal spread or collateral tissue damage should be minimal
20. Should have patient plate monitoring facility & should give audio-visual alarm & deactivate output if contact between patient & patient plate is not proper to eliminate risk of patient burns
21. Should have on screen review of error codes & diagnostics
22. Should be light weight and portable
23. Equipment should not have RF leakage more than 150mA
24. Laparoscopic instruments should be compatible with 5mm port
25. Should work with input 200 to240Vac 50Hzsupply
26. Laparoscopic vessel sealing hand instrument for cutting and coag 10mm shall be provided if available. The rate may be offered in the BOQ and which will not be taken for evaluation
27. Reusable open vessel sealing instrument (above 18 cm electrode length appx- Bigger Jaw)-1 No shall be provided if available. The rate may be offered in the BOQ and which will not be taken for evaluation.
28. Should supply 10mm Vessel sealing instrument with integrated cutting -1 No.
29. Should have FDA approval for the machine and instruments.
30. The system should have facility to connect the monopolar instrument, which can control the monopolar power from the sterile filed.
31. Should supply monopolar hand switching device with power control facility from the sterile field – 1 No
32. While using Vessel sealing instrument the lateral thermal spread should be less than 2 mm.
33. The system should be able to store minimum 50 no's of power settings with different names
34. The system must be future ready with capability of identifying the hand instruments with Radio Frequency Identification (RFID). (If the instrument is used earlier the machine should identify to avoid any kind of refurbed instrument)
35. Quoted Rate in Quotation should be a split-up as
    a. Basic ESU unit with vessel sealing
    b. Bipolar Footwitch
    c. Monoolar Foot switch
    d. Vessel Sealing Footswitch
    e. Universal adaptor for single lead monopolar electrode
    f. 10mm Vessel sealing instrument with integrated cutting
    g. Laparoscopic vessel sealing hand instrument for cutting and coag 5mm
    h. Laparoscopic vessel sealing hand instrument for cutting and coag 5mm integrated with monopolar hook in the same instrument
    i. Open vessel sealing instrument (15-18cmelectrodelengthappx-Smaller jaw)
    j. Disposable open vessel sealing instrument (above 18cm electrode length appx - Bigger Jaw)

k. 3pin Monopolar lead (Pencil) with handswitch
l. Patient pads with return electrode monitoring

36. Procurement proposal for machine as probe rate contract also should be given if applicable.

## 3 MULTIPARAMONITOR FOR OT

1. Multipara monitor suitable for use in advanced surgical procedures, clinical investigations and research activities
2. Monitor should be modular which has various modules for basic paramaters (ECG from 5 lead ECG, SPO2, NIBP, Respiration Rate and Temp) and other special parameters.
3. Should have TFT Multicolor display with at least 15 inches with at least 8 waveforms and numeric display simultaneously.
4. Should work on 200-240V AC/50Hz with inbuilt rechargeable battery of backup of minimum 2 hours.
5. Should have adult, pediatric and neonatal modes.
6. Automatic arrhythmia detection & alarm for standard and lethal arrhythmia.
7. Should have Trends of 48 hours at least
8. 200 nos. event recall/snapshot facility
9. Should have 12 Lead ECG display (simultaneous) with capability to derive 12 leads with 5/ 6 lead ECG cable only with graphical representation of 12 lead ST segment analysis
10. Masimo or reliable digital SPO2 with display perfusion index
11. NIBP can be taken on manual/auto/stat modes.
12. PWTT triggered NIBP is available
13. Should provide prominent prioritized audio, visual alarms for high, low heart rate, SpO2, RR, low battery and lethal arrhythmia
14. Monitor should have networking facility with bidirectional data flow (optional)
15. Monitor should have all in one kind of ports which supports multiple connections (desirable)
16. Equipment performance should not be affected by electromagnetic interferences radiated or conducted through power lines from another device
17. Quoted Rate in Quotation should be a split-up as
    a. Monitor with Accessories for ECG, SPO2, NIBP, Respiration Rate and Temp
    b. Networking facility with bidirectional data flow
    c. Cardiac output Module (Transpulmonary Thermodilution) and Kit
    d. Non Invasive Cardiac Output Module & Kit
    e. NMT Module with kit
    f. BIS/EEG Module and Sensor Kit
    g. Dual IBP Module
    h. AGM With Mainstream/Sidestream EtCo2 Module and Sensor Kit
    i. Adult 5 lead ECG Full Cable or Cable & Leadset if applicable
    j. Adult, Pediatric & Neonatal SpO2 Probe
    k. Adult & Pediatric NIBP Cuff

## 4 OT TABLE

1. The table should have minimum of 4 sections ie. head section, leg section, seat section and back plate section.
2. The table should be electrically operated having the following hand switch operated functions (all the dimensions will have a permitted deviation of +/- 10 %)

| No | Description | Range |
|---|---|---|

| | | |
|---|---|---|
| 1 | Up | 1000mm Maximum |

| | | |
|---|---|---|
| 2 | Down | 680mm Minimum |
| 3 | Trendelenburg | 25 Degree |
| 4 | Reverse Trendelenburg | 25 Degree |
| 5 | Right Lateral Tilt | 20 Degree |
| 6 | Left Lateral Tilt | 20 Degree |
| 7 | Back up | 80 Degree |
| 8 | Back Down | 40 Degree |
| 9 | Zeroing | (Desirable) |

3. In addition to the above motorized operated functions, the table must have the following manual functions.
    i. Head section tilting
    ii. The leg section should have 90° down movement and should move side wards to a minimum of 90 degree.
4. Table has Top Sliding facility (Optional)
5. The table must have an over ride panel switch by which it can be operated if the hand switch is not working.
6. The side rails must be equipped (at its tips) with a safety Lock System, which works by gravity itself, and prevents fixing clamps from falling down inadvertently.
7. The table must offer molded Polyurethene upholstery which has no joints and no stitching and water proof.
8. The table should have in-built kidney bridge
9. Should have enhanced weight bearing casters fitted with ball bearing.
10. Table should have a stable braking position with single lever foot operated brake pedal.
11. The table should be supplied with the following accessories.
    i. Mattress for the complete table top in sections - 1 set
    ii. A pair of arm boards with pad and fixing clamp – 1
    iii. A pair of padded shoulder support with clamps (SS grade 304) – 1
    iv. A pair of padded lateral support with clamps (SS grade 304) – 1
    v. A pair of padded leg crutches with clamps (SS grade 304) – 1
    vi. Anesthetic screen frame with clamp (SS grade 304) – 1
    vii. Should supply Patient restraint strap – 1No, A pair of padded leg support to use in trendelenburg position.
12. The table should have a heavy and sturdy base and compact to provide adequate foot room for the operating team.
13. Accessories, base cover, lifting column cover and side rails should be made of stainless steel.
14. The table shall have a radiolucent tabletop
15. Battery backup shall be available for minimum 50 functions.
16. Should have a minimum weight bearing capacity of 200Kg.

## 5 OT TABLE-T BASE

17. The table with Ortho base should have minimum of 4 sections ie. head section, leg section, seat section and back plate section.
18. The table should be electrically operated having the following hand switch operated functions (all the dimensions will have a permitted deviation of +/- 10 %)

| No | Description | Range |
|---|---|---|
| 1 | Up | 1000mm Maximum |
| 2 | Down | 680mm Minimum |
| 3 | Trendelenburg | 25 Degree |
| 4 | Reverse Trendelenburg | 25 Degree |

| | | |
|---|---|---|
| 5 | Right Lateral Tilt | 20 Degree |
| 6 | Left Lateral Tilt | 20 Degree |
| 7 | Back up | 80 Degree |
| 8 | Back Down | 40 Degree |

19. In addition to the above motorized operated functions, the table must have the following manual functions.
    i. Head section tilting
    ii. The leg section should have 90° down movement and should move side wards to a minimum of 90 degree.
20. The table must have an over ride panel switch by which it can be operated if the hand switch is not working.
21. The side rails must be equipped (at its tips) with a safety Lock System, which works by gravity itself, and prevents fixing clamps from falling down inadvertently.
22. The table must offer molded Polyurethene upholstery which has no joints and no stitching and water proof.
23. The table should have in-built kidney bridge
24. Should have enhanced weight bearing casters fitted with ball bearing.
25. Table should have a stable braking position with single lever foot operated brake pedal.
26. The table should be supplied with the following accessories.
    i. Mattress for the complete table top in sections - 1 set
    ii. A pair of arm boards with pad and fixing clamp – 1
    iii. A pair of padded shoulder support with clamps (SS grade 304) – 1
    iv. A pair of padded lateral support with clamps (SS grade 304) – 1
    v. A pair of padded leg crutches with clamps (SS grade 304) – 1
    vi. Anesthetic screen frame with clamp (SS grade 304) – 1
    vii. Should supply Patient restraint strap – 1No, A pair of padded leg support to use in trendelenburg position.
    viii. Square Pipe For Base Traction
27. The table should have a heavy and sturdy base and compact to provide adequate foot room for the operating team.
28. Accessories, base cover, lifting column cover and side rails should be made of stainless steel.
29. The table shall have a radiolucent tabletop
30. Battery backup shall be available for minimum 50 functions.
31. Should have a minimum weight bearing capacity of 200Kg.

## 6 ANESTHESIA WORKSTATION

1. The workstation should have a built-in anesthesia ventilator with pressure, volume-controlled, SIMV, Pressure support with Apnoea backup and spirometry.
2. It should be electronically controlled, pneumatically operated.
3. Should provide adult and pediatric reusable and autoclavable lightweight tubing breathing circuits.
4. Should be able to deliver a tidal volume from 20ml to 1500ml. Peak flow without fresh gas flow should be a minimum of 120L/min
5. Should have a battery backup for at least 1 hr with low battery alarm and overcharge protection.
6. Should have monitoring facility of airway pressure, tidal volume, frequency, oxygen concentration
7. Should have guided self test with facility to do full test as well as individual test for Ventilator leak, gas controls, circuit leak & individual vaporizer leak test with leak rate & indication whether within range (pass) or above usable range (fail).
8. Should have display of at least 7 inches for set parameters and graphical display for measured parameters
9. Anesthesia machine should be with 3 gas supply systems (O2, N2O, Air) with pipeline connections and reserve cylinder yokes.
10. Gas cylinder (pin indexed) yokes with sturdy clamping bars for easy handling.

11. Should supply pin index yokes for connecting cylinders for O2-1No, N2O – 1No, and Air, O2, N2O through the pipeline.
12. Should have pressure measurements for all gas inlets including central lines mounted on the front panel for easy visibility.
13. Should have an audible and visual alarm for major events
14. Oxygen and Nitrous oxide should be linked either mechanically or pneumatically to ensure a minimum of 25% oxygen delivery at all times to avoid delivery of hypoxic mixture.
15. Should have dual cascade/ virtual type flow meter for O2 and N2O and air calibrated in multiple scales.
16. The anesthesia machine should have a master control ON/OFF switch.
17. Provision to mount any two selected vaporizers of the same manufacturer with the interlocking facility to allow the use of only one vaporizer at a time.
18. Provision to mount 2 vaporizers (Isoflurane and sevo flurane vaporizer of newer generation having specifications equivalent to tech 8.
19. Non-return cum pressure relief valve when pressure exceeds 120 cmof H2O.
20. Should have only one common gas outlet (ACGO)
21. Should provide with oxygen flush switch.
22. Circle absorber with heated manifold / some inbuilt mechanism to remove water condensation. It should be autoclavable by dismantling without the help of any tools. It should be with ventilator selector switch and circle on/off switch. Should have an automatic Co2 bypass.
23. Should have low flow anaesthesia technique with tidal volume and fresh gas flow compensation capability to adjust for losses due to compression, compliance and leaks and compensation for fresh gas flow.
24. Should have a facility to connect the passive scavenging system
25. Should have a provision for mounting monitor with arm and minimum 3 drawers
26. Should have antistatic wheels and Foot brakes.
27. Reservoir bags 500ml, 1 liter, 1.5 liter, and 2liters along with the machine.
28. A pressure regulated valve with a 5-meter hose and connector (conversion kit) for oxygen and N2O should be provided with each machine – 1 each.
29. Should be supplied with driver gas hoses with necessary attachments (color-coded).
30. Should work in 220-240Vac 50 Hz input supply.
31. The Anesthesia machine, ventilator, and vaporizer should be from the same manufacturer
32. Cost of vaporizers to be quoted Separately (Tech 8 for isoflurane & Sevoflurane and Tec-6 or above for Desflurane)

## 7 ANESTHESIA WORKSTATION HIGH-END WITH ANAESTHESIA GAS MONITORING

1. Anesthesia Workstation complete and integrate with anesthesia gas delivery system, Circle absorber and provision for precision vaporizers 2 No
2. Anesthesia Ventilator with integrated AGM as plug and play module with etCO2 (side stream)
3. Essential accessories to make the system compete and compatible with the existing system of gas outlet.
4. Should be compact, ergonomics & easy to use.
5. Machine should provide with electronic gas measurement with virtual Flow meter.
6. Integrated Multi-Color TFT display of at least 15" size tiltable to minimum 180 degree angle for ease of operation
7. Dual flow sensing capability at exhalation and inhalation port with heated flow or any other credible flow sensor for stable monitoring.
8. Should have back up O2 control which provides' an independent fresh gas source and flow meter control in case of electronic failure (Auxiliary flow meter).
9. One number pin indexed yoke each for O2 and N2O. Separate pipeline inlet for oxygen, Nitrous Oxide and Air.

10. Hypoxic Guard (Pneumatic/Electronic) to ensure minimum 25% 02 across all 02-N20 mixtures and oxygen failure warning.
11. Latex free breathing system should be easily dismantled without the help of any tools and fully autoclavable upto 134 degree celcius
12. Flow sensing capability at inhalation or exhalation ports, sensor connections shall be internal to help prevent disconnect
13. Flow sensor should not require daily Maintenance and should be autoclavable upto 134 degree Celcius
14. Bag to vent switch shall be bi-stable and automatically begins mechanical ventilation in the ventilator position
15. Adjustable pressure limiting valve shall be flow and pressure compensated Breathing system dead space including all the active parts during closed ventilation should be less than 3 Litres.
16. Standard circle absorber system Should have adjustable pressure limiting valve, breathing circuit pressure measuring device
17. Should have a bag/ventilator selecting valve integrated onto the absorber Should be suitable to use low flow anesthesia techniques with active software available to prevent hypoxia Should have oxygen sensor of galvanic or any other credible type.
18. Should have CO2 absorbent chamber canister of less than 1 Ltr with automatic CO2 bypass
19. Company should have new generation vaporizer must be isolated from the gas flow in the off position and prevent the simultaneous activation of more than one vaporizer.
20. Vaporizer should be able to mount to a selectatec manifold of Temperature, pressure and flow compensated vaporizers which allows easy exchange between agents
21. The workstation should have integrated anesthesia ventilator system for adult, pediatric & infants.
22. Ventilator should have volume control and pressure controlled SIM V/P, CPAP PSV, PRVC/ PCV VG/ Auto flow and PEEP. Lung recruitment & pause gas facility should be available.
23. Ventilator should have a tidal volume compensation capability to adjust for losses due to compression, compliance and leaks; and compensation for fresh gas flow.
24. The workstation should be capable of delivery of low flow anesthesia.
25. Ventilator should be capable of at least 120L/min peak flow- without considering fresh gas flows.
26. Ventilator should have guided self test with facility to do full test as well as individual test for Ventilator leak, gas controls circuit leak & individual vaporizer leak test with leak rate & indication whether within range (pass) or above usable range (fail).
27. Should have an option /mode to show the efficiency of fresh gas flow setting while used in low and minimal flow that will prevent of any fresh gas deficit or chance of getting hypoxic mixture during minimal flow or Provision for display of safe level of Oxygen to be delivered into circuit to maintain a specific FiO2 at patient end especially useful while conducting minimal flow anaesthesia and controlling fresh gas flow manually when integrated with Anaesthesia Gas monitoring Module.
28. Anaesthesia Workstation with US-FDA standard will be high preferable.
29. Display of ventilator
    a. Tidal volume (VT)
    b. Inspiratory /Expiratory ratio (I:E).
    c. Inspiratory pressure (P inspired)
    d. Pressure limit (P limit)
    e. Positive End Expiratory Pressure (PEEP)
    f. Ventilator waveform
30. The equipment should have the provision for Centralized monitoring and Networking
31. Machine should have facility to connect to passive AGSS (Anesthetic Gas Scavenging System)
32. Should also supply passive scavenging tube.
33. Power input to be 220-240VAC, 50HZ/ as appropriate fitted with Indian plug.

34. Battery backup for minimum 1 hour for the entire system.
35. At least two built in auxiliary power outlets with switch and circuit breaker.
36. The Anesthesia machine, Ventilator, Vaporizers, Monitor & Modules should be from same manufacturer to maintain uniformity of part and efficient after sales service.
37. Reservoir bags 500ml, 1 liter, 1.5 liter, and 2 liters along with the machine.
38. Certificate of calibration and inspection from factory shall be provided.
39. Cost of vaporizers to be quoted Separately (Tech 8 for isoflurane & Sevoflurane and Tec-6 or above for Desflurane)

## 8 FLUID WARMER

1. Flow Rates should be maximum 1500 ml/ hour.
2. Should have range of temperature settings of 1 Degree increase both side of 37 Degree. (prefixed 37 Degree also can participate)
3. Should be easily transportable.
4. Should able to attach to I V pole and standard electrical sockets.
5. Should use any methods such as IV line heating/ chamber/cabinet
   **(Warmer doesn't require additional consumables will have high priority while evaluation)**
6. Should have audible and visual alarms for Temperature.
7. Should have automatic cutoff for set temperature.
8. Should be easy to use and to clean.
9. Warm up time should be less than 60 seconds.
10. Consumable if any, should be quoted separately.

## 9 VIDEO LARYNGOSCOPE-HANDHELD

1. Should be a Video Laryngoscope with handle mounted LED display of size at least 2.4 inch and CMOS Camera.
2. Should have LED light illumination
3. Blade Types: Channeled / Un channeled, Reusable / Diaposable
4. Should have a robust antifogging mechanism
5. Should be autoclaveable / Sterlizable
6. Should be supplied with rechargeable battery and provision for re-charge.
7. Should have a battery backup facility of minimum 1 hr
8. Should have provision to insert all sizes of endotracheal tube/ to do separate intubation with intubation guide.
9. Quoted Rate in Quotation should be a split-up as
    1) Handle unit with camera
    2) Standard Macintosh Type (Adult)-Alll sizes
    3) Standard Macintosh Type (pediatric)-Alll sizes
    4) D Type Large adult Difficult Intubation- Alll sizes
    5) Adult and Pediatric intubation stylet

## 10 FLASH STERILIZER

1. Should have a capacity of 18 - 20 Litres (approximately)
2. The sterilizer should have a Rectangular/ Cylindrical chamber with maximum processing capacity per charge at least 3-5 S.S. trays of 325 x 185 x 15 mm size (±10%)

3. Table Top Sterilizers should be equipped with B-process, N-process as per latest EN 1306
4. Chamber should be made of S.S 316 & should comply the Pressure Equipment Directive (PED) & EN 13445 norms.
5. Chamber should have Stress & Fatigue analysis reports for material & construction of the pressure vessel.
6. Chamber should be equipped with electrically heated jacket for preheating on standby mode.
7. Chamber should have working pressure 2.2 bar & design pressure upto 3.8 bar.
8. Chamber should have minimum 10 years warranty or should confirm 44-50,000 process minimum life.
9. Should have horizontal sliding / hinged door and the doors should come with silicon elastomeric rubber gasket to withstand
10. temperature upto 140°C & 2560 kg pressure
11. A disposable air filter should be provided for filtering the atmospheric air before entering inside the chamber. The filter separation efficiency should be higher than 99.998% for particle size less than 0.3µm
12. Should have following cycle programs
    a. 134°C Wrapped.
    b. 121°C Wrapped.
    c. 134°C Flash/Rapid open instrument cycle
    d. 134°C Textile
    e. 134°C Prions
    f. Test programs: Bowie & Dick, Leak Test.
13. Sterilizer should have inbuilt water reservoir with storage capacity up to 5 Ltrs. The water reservoir should have easy access for cleaning & to avoid bio film
14. Sterilizer should have inbuilt steam generator. Any additional feature such as energy storing system for sterilization loads in short time will be preferred
15. The control system should be microprocessor based PLC system specially designed for Sterilization applications. The control system should have CPU processor with battery back-up, Digital input/output controls, analog measuring inputs & COM ports for printer & PC connectivity.
16. Automatic process checking & failure correction should be possible by the control system. The range of alarm should include Temperature & pressure sensor failure, phase time-out, doors not properly closed, power failure (less than 10 sec should be ignored), continuous self-checking of all the safety devices, low water level etc. All the alarms should be audio-visual.
17. The sterilizer unit should included Rack with 3 - 5 levels & suitable size instrument trays should be the part of the supply for every sterilizer. The Sterilizer should have water circulation system so that no drain point & fixed water inlets required

## 11 ULTRASOUND COLOR DOPPLER PORTABLE

1. A state of art fully digital, compact, Colour Doppler Ultrasound machine
2. Light weight and pinless connector technology (desirable)
3. Unit should be able to give very high image quality with advance technologies for better cardiac contrast resolution, tissue differentiation and edge detection, equivalent to high, field cart based systems. – **Bidders are directed to please specify their technology**
4. System should be able to support speckle reduction imaging for better tissue differentiation and edge enhancement phase. **Bidders are directed to please specify their technology**
5. Imaging modes of Real time 2D, Color Doppler, Pulsed wave Doppler, Power Doppler must be available on system
6. System must have fast start up to scanning in less than 20 seconds from off condition, for use in critical and emergency situations (Model with super fast start up will be preferred high)
7. System should support transducer technologies like phased array, convex, TEE, Linear, Hockey stick probe etc

8. System shall process a dynamic range that is at least 160 db. The system must display at a minimum depth of 30 cm.
9. Unit must sturdy and drop safe on accidental hit against the hard surface for use in busy hospital environment. Any damage due to accidental fall/ hit shall be rectified at free of cost during Warranty and CAMC period.
10. Flat LCD/ TFT/ LED monitor of at least 10 inches or more with flicker free image
11. Alphanumeric soft keys keyboard with easy access scans controls, facility to sanitize the system keyboard to avoid cross contamination in ICU environment.
12. 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 2 (two) hours, this need to be demonstrated if needed. Battery replacement during Warranty and CAMC period should done free of cost if needed
13. The system must have at least 16 GB memory card for storage and retrieval of images and clips data/ Internal hard disk
14. The system shall support the all DICOM functionality. Storage, Print and Work List also ready to connect to PACS
15. System should possess software for ENHANCED Needle Visualization to track the needle clearly at steep angles during the procedures while maintaining striking image quality of the target structures and the surrounding anatomy with simple On/Off functionality on both convex & linear transducers. Bidders are directed to please specify their technology
16. System should have both European CE and US FDA quality certification
17. Onsite product training and access to online education material must be provided post installation of the system
18. Mobile cart with transducer holder and space for printer
19. Triple Transducer Connector facility to connect three probes simultaneously when system is kept on trolley.
20. Quoted Rate in Quotation should be a split-up as
    a. Ultrasound Machine with cart, application packages as asked
    b. 2-5 (+/-1) MHz multi-frequency broadband curved array transducer for general purpose, abdominal, deep nerve access and musculoskeletal applications
    c. 6-13 (+/-1) MHz multi-frequency, broad band linear array transducer for vascular, nerve imaging with less than 40mm size for vascular access, small parts, vascular, musculoskeletal applications. Higher frequency will be preferred
    d. 6-13 (+/-1) MHz multi-frequency hockey stick shaped linear array transducer for pediatric, small parts, nerve, vascular, msk applications with 25mm foot print
    e. 1-5 MHz (+/- 1 MHz) multi – frequency broadband phased array transducer for abdominal, cardiac and lung applications

## 12 NEONATAL / PEDIATRIC VENTILATOR WITH HFOV

1. It should be specifically designed for Invasive & Non Invasive operation for Neonatal / Infant Patient Range.
2. It should allow the user to deliver conventional ventilation as well as HFOV in same circuit.
3. It should have capability of mechanical ventilation of a range of patients from 300g - 20Kg body weight.
4. It should have effective mechanism to reduce work of breathing for Neonates.
5. It should have active inspiration and active expiration in HFOV.
6. Conventional Mode Parameter should be at least
   6.1. BPM: 1 to 150
   6.2. Inspiratory Time: 0.1 to 3 sec
   6.3. CPAP Pressure: 0 to 20 mbar
   6.4. Inspiratory Pressure: 0 to 60 mbar
   6.5. FIO2: 21% to 100%
   **6.6. Tidal Volume 2-200 ml with Volume Guarantee**

7. HFO Mode Parameters should be at least

7.1. HFO Frequency 5 to 18
Hz7.2. I:E Ratio: 1:1, 1:2,
1:3

**7.3. Tidal Volume 2-200 ml with Volume Guarantee**

8. It should have VG/ Targeted Tidal Volume Mode or equivalent modes to give Maximum Tidal volume
9. It should have following modes CPAP, CMV+ TTV, PTV, PSV, SIMV+ TTV + PSV, HFO, HFO+CMV or equivalent modes
10. It should have Delta Pressure of 90 mbar
11. It should have ability to preset parameters in all modes of operation
12. It should have powerful HFO with active expiration to cover a wide range of patients
13. It should have full colour, touch screen operation
14. It should have integral flow monitoring measuring lung mechanics and displaying of loops and waveforms
15. User selectable square and sinusoidal waveform should be possible
16. It should be supplied with original trolley
17. It should have trending of measured parameters with memory of 24 hours.
18. It should have integral battery with at least 30 minutes operating capability
19. It should be supplied with Servo heated humidifier and reusable circuit
20. Ventilator should be compatible with nitric oxide delivery system.
21. Mandatory US-FDA certified product