

Operation Room & ICU

Blood Gas Analyzer

No.	Item Specifications
1	Description of Function
1.1	Blood gas analysers are used to measure blood gases , electrolytes , pH values and biochemical parameters of the blood
2	Operational Requirements
2.1	Fully automatic, upgradeable, fast electrolyte combi analyser.
3	System Configuration
3.1	Fully automatic Blood Gas Analyser with electrodes and built in printer.
4	Technical Specifications
4.1	Essential Measured parameters; pH, pCO ₂ , pO ₂ , tHb, Barometric Pressure, Na ⁺ , K ⁺ , Ca ⁺⁺ , Cl ⁻ , BI urea and Sr Creatinine & Blood sugar. All these parameters must be measured simultaneously
4.2	Calculated parameters must include BE, BE ecf, HCO ₃ , Lactate, Anion Gap, SaO ₂ etc.
4.3	Sample volume-less than 100ul.
4.4	Fast analysis time – less than 60 sec
4.5	Maintenance free electrodes with individual electrodes ON/OFF facility
4.6	Fully automatic liquid calibration of all parameters at user-defined intervals without the use of Gas calibrated reagents, external gases, tanks or regulators
4.7	Continuous reagent level monitoring with graphic display.
4.8	Data display on well-illuminated, adequate size LCD colour touch screen display.
4.9	Data print out on built in graphic printer.
4.1	Built in auto Quality control facility
4.11	Automatic result processing, test ordering and transmission to the LIS/HIS system(laboratory Information System/Hospital Information System)
4.12	Automatic data archiving and customizable layout. Data backup with read/write CD-ROM drive
4.13	USB ports for easy connection of e.g. flash drives, keyboards, etc.
5	Accessories, spares and consumables
5.1	Accessories:
	☐ Reagents for one year at 20 samples/day or as per requirement must be provided along with the machine.
	☐ Electrodes for all the parameters as specified -01 set
	☐ Quality control tools/reagents for one year at 20 samples a day-01 set or as per requirement.
	☐ Cost of reagents must be quoted for comparative evaluation.
5.2	All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer.
6	Operating Environment
6.1	The product offered shall be designed to be stored and to operate normally under Power Supply, Climate, Temperature, Humidity, etc. for Sudan.
6.2	Power supply: 220 – 240 VAC, 50Hz fitted with appropriate plug. The power cable must be at least 3 metre in length.
6.3	UPS of suitable rating shall be supplied for minimum 30 min. backup for the entire system
7	Standards and Safety Requirements
7.1	Must submit ISO13485:2003/AC:2007 for Medical Devices AND
7.2	CE (93/42 EEC Directives) or USFDA or TUV approved product certificate.
7.3	Shall meet IEC 61010-2-081: Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 2-081: Particular requirements for automatic and semi-automatic laboratory equipment for analysis and other purposes
8	User Training
8.1	Must provide user training (including how to use and maintain the equipment).
9	Warranty
9.1	Comprehensive warranty for 2 years.
10	Maintenance Service During Warranty Period
10.1	During the warranty period supplier must ensure planned preventive maintenance (PPM) along with corrective/breakdown maintenance whenever required.
11	Documentation
11.1	User (Operating) manual in English
11.2	Service (Technical / Maintenance) manual in English
11.3	List of important spare parts and accessories with their part numbers and costing.
11.4	Certificate of calibration and inspection from factory.

Auto CPAP

No.	Item Specifications
1	Should be an auto adjusting CPAP with pressures ranging from 4 to 20 cmH2O
2	Unit should be light weight (less than 1.5 Kg) and noise less than 30 dBA
3	The unit should have an automatic altitude setting.
4	The unit should have an Automatic mode & manual mode of selection.
5	Should have an Ramp Time Automatic of 5 - 45 minutes
6	Should have a backlit LCD display for easy viewing
7	Should be able to change the settings with easy to use rotary control dial
8	The unit should have comfort feature A-Flex which adjusts air pressure based on patient need on every inhalation & exhalation
9	Unit should have C-flex/C-Flex+ mode when unit is running as manual CPAP.
10	The unit should have System one resistance control for optimized pressure delivery, no matter which mask is used
11	Mask fit and seal monitoring should be capable to check the seal of the mask.
12	Should have advanced event detection algorithm which detects and records CA, OA,CSR, RERA, Hypopnea, Vibratory snore, Large leak & Flow limitation for helping the physicians in opting for alternate therapy.
13	Should have Memory for recording the usage & compliance data .
14	The unit should have 2 years warranty
15	CE or USFDA or TUV approved certificate.
16	MASK: Should be able to select between medium and small size.
17	Mask should be provided with angled exhalation micro ports.
18	Should have blue gel with silicon membrane to create an effective self adjustment seal.
19	The mask should have silicone spring facility to enable patient to move in any direction.
20	HUMIDIFIER also should be supplied along with the System and should be of dry box technology such that it takes the room humidity into account while humidifying.
21	Tubing connection to be at the top of the humidifier unit.
22	Should have sensors both inside and outside the machine to allow it to accurately make changes in humidity and prevent condensation from forming inside the tube.
23	Power supply: 220 – 240 VAC, 50Hz fitted with appropriate plug. The power cable must be at least 3 metre in length.
8 User Training	
8.1	Must provide user training (including how to use and maintain the equipment).
9 Warranty	
9.1	Comprehensive warranty for 2 years after acceptance.
10 Maintenance Service During Warranty Period	
10.1	During warranty period supplier must ensure corrective/breakdown maintenance whenever required.
11 Documentation	
11.1	User (Operating) manual in English.
11.2	Service (Technical / Maintenance) manual in English.
11.3	List of important spare parts and accessories with their part numbers and costing.
11.4	Certificate of calibration and inspection from factory.

Defibrillator

No.	Item Specifications
1 Description of Functions	
1.1	To be used in emergency & critical care departments to meets various resuscitation and monitoring needs.
2 Operational Requirements	
2.1	It shall operate on AC power supply and internal battery.
3 System Configurations	
3.1	Defibrillator with complete accessories.
4 Technical Specifications	
4.1 Defibrillation function:	
4.2	It shall be a manual defibrillator for external defibrillation
4.3	Able to perform synchronized defibrillation and non-invasive pacing therapy.
4.4	Defibrillation energy selection:
4.5	External monophasic: 50 - 360J
4.6	External biphasic: 50 - 200J
4.7	External Paediatric /neonatal: 2 - 20J
4.8	System shall be user friendly, lightweight and easily transportable.
4.9	Waveform shape: biphasic.
4.10	The defibrillator paddles shall be easily interchangeable among adult, child, infant and internal paddles. It shall come with at least adult and paediatric paddles.

4.11	Can be used for neonatal/paediatric and adult defibrillation.
4.12	The unit shall be able to perform defibrillation and monitoring by using disposable electrodes.
4.13	Shall have an electrode contact-quality indicator to minimize the risk of ineffective defibrillation.
4.14	Recharge time shall not be held longer than 10 seconds before discharge.
4.15	Energy charge & discharge and other selection/control buttons shall be available at the paddle handles.
4.16	ECG monitoring function:
4.17	Shall have a 3-leads ECG, Lead I, II & III, monitoring capability protected from defibrillation by mean of ECG electrodes and through-the-paddles monitoring
4.18	With heart rate display and alarms
4.19	With Lead-fault indicator
4.20	Shall have an integrated thermal printer/ recorder with paper speed of 25mm/sec
4.21	General function:
4.22	Shall have LCD that displaying at least dual ECG channel, HR, battery status, shock indicator and various data. Bidder to specify size of LCD screen and the no. of waveforms which can be displayed.
4.23	Shall have audio and visual alarms. (Please indicate in the next column type of alarms available)
4.24	Shall have HR limit and shockable rhythms alarms
4.25	Shall have a rechargeable battery when it is fully charged it shall deliver approximately 40 - 50 discharges or 2 hours of continuous ECG monitoring. Bidder to specify the type of battery used and number of discharge and monitoring hour.
4.26	Must have an electrode contact-quality indicator to minimize the risk of ineffective defibrillation.
4.27	The unit shall be portable and come with a carrying bag able to keep all required accessories and consumables.
4.28	Please indicate the weight in kilogram (KG) of the unit included all accessories and carrying case. It shall be within 8kg
5	Accessories, Spare Parts and Consumables
5.1	Accessories:
	☐ Rechargeable battery, 1 piece on the unit
	☐ Thermal paper x 2 rolls/sets
	☐ Power cord x 1 set
	☐ 3 wire ECG cable x 1 set for ECG monitoring
	☐ Disposable ECG electrodes, 50 pieces
	☐ Carry Bag/case x 1 set
5.2	All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer.
6	Operating Environment
6.1	The product offered shall be designed to be stored and to operate normally under Power Supply, Climate, Temperature, Humidity, etc. for Sudan.
6.2	Power supply: 220 – 240 VAC, 50Hz fitted with appropriate plug. The power cable must be at least 3 metres in length.
7	Standards & Safety Requirements
7.1	Must submit ISO13485:2003/AC:2007 for Medical Devices AND
7.2	CE (93/42 EEC Directives) or USFDA or TUV approved product certificate.
7.3	Comply to AHA & ACLS requirements or equivalent
7.4	Electrical safety conforms to standards for electrical safety IEC-60601-1 General Requirements and IEC-60601-2-25 Safety of Electrocardiograms.
8	User Training
8.1	The Supplier shall conduct user training for this equipment to enable operators to use the equipment properly. The training shall include the use of all operational functions of the equipment, as well as routine checks and maintenance expected by users.
9	Warranty
9.1	Comprehensive warranty for 2 years.
10	Maintenance Service During Warranty Period
10.1	During the warranty period supplier must ensure planned preventive maintenance (PPM) along with corrective/breakdown maintenance whenever required.
11	Documentation
11.1	User (Operating) manual in English
11.2	Service (Technical / Maintenance) manual in English
11.3	List of important spare parts and accessories with their part numbers and costing.
11.4	Certificate of calibration and inspection from factory.

Defibrillator for Cardiology

No.	Item Specifications
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1	Description of Functions
1.1	To be used in emergency & critical care departments to meets various resuscitation and monitoring needs.
2	Operational Requirements
2.1	It shall operate on AC power supply and internal battery.
3	System Configurations
3.1	Defibrillator with complete accessories.
4	Technical Specifications
4.1	Defibrillation function:
4.2	It shall be a manual defibrillator for internal and external defibrillation
4.3	Able to perform synchronized defibrillation and non-invasive pacing therapy.
4.4	Defibrillation energy selection:
4.5	Internal: 5 - not more than 50 J
4.6	External monophasic: 50 - 360J
4.7	External biphasic: 50 - 200J
4.8	External Paediatric /neonatal: 2 - 20J
4.9	System shall be user friendly, lightweight and easily transportable.
4.1	Waveform shape: biphasic.
4.11	The defibrillator paddles shall be easily interchangeable among adult, child, infant and internal paddles. It shall come with at least adult and paediatric paddles.
4.12	Can be used for neonatal/paediatric and adult defibrillation.
4.13	The unit shall be able to perform defibrillation and monitoring by using disposable electrodes.
4.14	Shall have an electrode contact-quality indicator to minimize the risk of ineffective defibrillation.
4.15	Recharge time shall not be held longer than 10 seconds before discharge.
4.16	Energy charge & discharge and other selection/control buttons shall be available at the paddle handles.
4.17	ECG monitoring function:
4.18	Shall have a 3-leads ECG, Lead I, II & III, monitoring capability protected from defibrillation by mean of ECG electrodes and through-the-paddles monitoring
4.19	With heart rate display and alarms
4.2	With Lead-fault indicator
4.21	Shall have an integrated thermal printer/ recorder with paper speed of 25mm/sec
4.22	Non-invasive external pacing:
4.23	Pacing mode: at least 2 modes of demand and fixed rate.
4.24	Pacing rate: 50 - 150 ppm
4.25	Output current: 0 - 140 mA
4.26	Pulse width: > 20 msec
4.27	General function:
4.28	Shall have LCD that displaying at least dual ECG channel, HR, battery status, shock indicator and various data. Bidder to specify size of LCD screen and the no. of waveforms which can be displayed.
4.29	Shall have audio and visual alarms. (Please indicate in the next column type of alarms available)
4.3	Shall have HR limit and shockable rhythms alarms
4.31	Shall have a rechargeable battery when it is fully charged it shall deliver approximately 40 - 50 discharges or 2 hours of continuous ECG monitoring. Bidder to specify the type of battery used and number of discharge and monitoring hour.
4.32	Must have an electrode contact-quality indicator to minimize the risk of ineffective defibrillation.
4.33	The unit shall be portable and come with a carrying bag able to keep all required accessories and consumables.
4.34	Please indicate the weight in kilogram (KG) of the unit included all accessories and carrying case. It shall be within 8kg
5	Accessories, Spare Parts and Consumables
5.1	Accessories:
	☐ Rechargeable battery, 1 piece on the unit
	☐ Thermal paper x 2 rolls/sets
	☐ Power cord x 1 set
	☐ 3 wire ECG cable x 1 set for ECG monitoring
	☐ Disposable ECG electrodes, 50 pieces
	☐ Disposable pacing electrodes, 10 pieces
	☐ Carry Bag/case x 1 set
5.2	All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer.
6	Operating Environment
6.1	The product offered shall be designed to be stored and to operate normally under Power Supply, Climate, Temperature, Humidity, etc. for Sudan.

6.2	Power supply: 220 – 240 VAC, 50Hz fitted with appropriate plug. The power cable must be at least 3 metres in length.
7	Standards & Safety Requirements
7.1	Must submit ISO13485:2003/AC:2007 for Medical Devices AND
7.2	CE (93/42 EEC Directives) or USFDA or TUV approved product certificate.
7.3	Comply to AHA & ACLS requirements or equivalent
7.4	Electrical safety conforms to standards for electrical safety IEC-60601-1 General Requirements and IEC-60601-2-25 Safety of Electrocardiograms.
8	User Training
8.1	The Supplier shall conduct user training for this equipment to enable operators to use the equipment properly. The training shall include the use of all operational functions of the equipment, as well as routine checks and maintenance expected by users.
9	Warranty
9.1	Comprehensive warranty for 2 years.
10	Maintenance Service During Warranty Period
10.1	During the warranty period supplier must ensure planned preventive maintenance (PPM) along with corrective/breakdown maintenance whenever required.
11	Documentation
11.1	User (Operating) manual in English
11.2	Service (Technical / Maintenance) manual in English
11.3	List of important spare parts and accessories with their part numbers and costing.
11.4	Certificate of calibration and inspection from factory.

ECG Machine

No.	Item Specifications
1	Description of Function
1.1	ECG Machine is primary equipment to record ECG Signal in various configurations.
2	Operational Requirements
2.1	Microprocessor controlled digital 3 channel ECG machine suitable for adult, paediatric and neonate applications.
3	System Configuration
3.1	3 channel ECG machine with complete accessories.
4	Technical Specifications
4.1	3 channel ECG machine with simultaneous acquisition of 12 standard leads: aVR, aVL, aVF, I, II, III and V1-6 pre-cordials.
4.2	Internal memory for storage of up to 50 ECGs.
4.3	Splash-resistant alphanumeric keyboard with function keys.
4.4	With zeroing reset, auto-base-line correction (0.5Hz) and 1mV test/calibration signal.
4.5	Filter setting for line-frequency (50 or 60Hz) and tremor.
4.6	Continuous check on the quality of electrodes connection, audio visual alert on loss of signal.
4.7	Appropriately protected for operation during defibrillation.
4.8	Alphanumeric colour LCD display, approximately: 4".
	Display shows ECG-curves, heart rate, patient name and ID, time, age, sex, speed and filter setting.
4.9	ECG machine shall have 3 modes of operation – Automatic, Manual & Rhythm.
4.1	Shall have measurements and analysis programs.
4.11	Measurements: QRS rate, PR interval, QRS duration, QT/QTc, P/QRT/T axes, RV5/SV1.
4.12	Shall have interpretation and waveform analysis.
4.13	Shall have maintenance free digital thermal array printer.
4.14	Printer shall be able to print ECG report and must have on/off selection.
4.15	Shall have ECG lead annotation facility.
4.16	Paper speed, user adjustable: 25 and 50mm/sec.
4.17	CMRR shall be > 100dB.
4.18	Sensitivity, automatic or user selectable: 5, 10 and 20mm/mV.
4.19	Rechargeable battery & charger integrated in the device.
4.2	Battery autonomy, approximately 2 hours.
4.21	The unit shall be compact, light in weight, easy to carry.
5	Accessories, spares and consumables
5.1	Accessories:
	☐ Reusable Patient cable with reusable electrodes for adult & paediatric- 2 set.
	☐ Reusable patient cable with reusable electrodes for neonate & infant- 1 set.
	☐ Extremity clamp electrodes, reusable- 4 nos.
	☐ Recording paper rolls- 12 rolls
	☐ Bottles of electrode gel, approximately 350ml- 2 nos.

	☐ Spare rechargeable battery pack- 1 no.
	☐ Set of spare fuses- 1 set
	☐ Plastic protective dustcover- 1 no.
5.2	All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer.
6	Operating Environment
6.1	The product offered shall be designed to be stored and to operate normally under Power Supply, Climate, Temperature, Humidity, etc. for Sudan.
6.2	Power supply: 220–240V AC, 50Hz fitted with appropriate plug type D round 3 pins. The power cable must be at least 3 metre in length.
7	Standards and Safety Requirements
7.1	Must submit ISO13485:2003/AC:2007 for Medical Devices AND
7.2	CE (93/42 EEC Directives) or USFDA approved product certificate.
7.3	Electrical safety conforms to standards for electrical safety IEC-60601-1 General Requirements and IEC-60601-2-25 Safety of Electrocardiograms.
8	User Training
8.1	Must provide user training (including how to use and maintain the equipment).
9	Warranty
9.1	Comprehensive warranty for 2 years after acceptance.
10	Maintenance Service During Warranty Period
10.1	During the warranty period supplier must ensure preventive maintenance and corrective/breakdown maintenance whenever required.
11	Documentation
11.1	User (Operating) manual in English.
11.2	Service (Technical / Maintenance) manual in English.
11.3	List of important spare parts and accessories with their part numbers and costing.
11.4	Certificate of calibration and inspection from factory.

Hot air Oven

No.	Item Specifications
1	Description of Function
1.1	Hot Air Oven is required for heating a sample under controlled conditions.
2	Operational Requirements
2.1	Microprocessor based system with PID-temperature controller with integrated auto diagnostic system with fault indicator.
3	System Configuration
3.1	Microprocessor based Hot Air Oven.
4	Technical Specifications
4.1	External: Stainless Steel Casing; w x h x d: Approx. 600 x 600 x 600 mm, insulated stainless steel door with locking and rear zinc-plated steel.
4.2	Interior: w x h x d: Approx. 400mm x 400mm x 400mm. Easy to clean, interior made of stainless steel, with supports on the three sides for three adjustable perforated stainless steel shelves.
4.3	Forced air circulation by quiet air turbine/Fan to ensure uniform temperature.
4.4	Fitted with load indicator and safety thermostat take over indicator lamp. LCD/LED indicator.
4.5	Temperature Variation +/- 1.
4.6	Temperature Range- ambient to 250 oC
4.7	Output available for data acquisition.
4.8	Hot Air Oven shall be mounted on suitable epoxy powder coated support stand having 4 robust 360 deg. swivel lockable castor wheels for easy movement and repositioning.
5	Accessories, spares and consumables
5.1	All standard accessories/consumables/parts required for the proper operation of the above item shall be included in the offer.
6	Operating Environment
6.1	The product offered shall be designed to be stored and to operate normally under Power Supply, Climate, Temperature, Humidity, etc. for Sudan.
6.2	Power supply: 220-240V/ 50 Hz AC Single phase fitted with appropriate plugs. The power cable must be at least 3 metres long.
7	Standards and Safety Requirements
7.1	Must submit ISO 9001 or ISO 13485:2003/AC: 2007 AND
7.2	CE or USFDA or TUV approved product certificate.
8	User Training
8.1	User training must be provided onsite
9	Warranty

9.1	Comprehensive warranty for 2 years after acceptance.
10	Maintenance Service During Warranty Period
10.1	During the warranty period supplier must ensure corrective/breakdown maintenance whenever required.
11	Installation and Commissioning
11.1	Supplier must accomplish proper installation and commissioning of the equipment on site.
12	Documentation
12.1	User (Operating) manual in English.
12.2	Service (Technical / Maintenance) manual in English.
12.3	List of important spare parts and accessories with their part number and costing.
12.4	Certificate of calibration and inspection from factory.

I.C.U Beds

1	Description of Function
1.1	ICU Beds are required in the Intensive Care for comfort of the patient and to facilitate comfortable transfer to and from emergency/OT/Wards etc. It is also required to carry out point of care procedures including radiological procedures at the bedside.
2	Operational Requirements
2.1	The system should be electrically operatable and adjustable for heights, trendelenburg etc.
	It should also be having radiotranslucent top
3	System Configuration
3.1	Electrically and pneumatically operated ICU bed with mattress.
4	Technical Specifications
4.1	Should have four section mattress base
4.2	Should have X-Ray translucent back section made up of high pressure laminate.
4.3	Should have X-Ray cassette holder underneath the back section & should allow insertion of X-Ray cassette from either side of the bed.
4.4	Base frame & support frame should be made up of steel for long life & prevention from rusting.
4.5	Should have step less electrical adjustment for the following :-
	Height : 450-840 mm
	Back section : 0- 50 degrees
	Leg Section : 0-30 degrees
4.6	Should have step less pneumatic adjustment for Trendelenburg (25° approx.), antitrendelenburg (15° approx.)
4.7	Should have a manual quick release mechanism for back section adjustment during emergency situation
4.8	Should be equipped with four articulated half-length tuck away side rails
4.9	Should be equipped with large castors (diameter 150 mm) with central braking and steering facility.
4.10	Mattress of the Bed should be made up of high density foam with Anti-Microbial agent incorporated into all components that assists in Prohibiting growth of bacteria & fungi and easy to clean.
4.11	Mattress should be fully Radiolucent for ease in performing portable X-Rays.
4.12	Should have bumpers at all four corners and place for fixing accessories
4.13	Dimensions of bed (approx.) :
	Length : 2200 -2290 mm
	Width : 850 -1020mm
	Mattress Size : appropriate as per bed size
5	Accessories, spares and consumables
5.1	Accessories:
	· I.C.U Bed Mainframe -01
	· Bed Ends, detachable : 01 pair
	· Articulated half-length tuck away side rails : 04 Nos.
	· IV Rods: 01 No.
	· Mattress 12 cm Thick : 01 No.
6	Operating Environment
6.1	The product offered shall be designed to be stored and to operate normally under Power Supply, Climate, Temperature, Humidity, etc. for Sudan.
6.2	Power supply: 220 – 240 VAC, 50Hz fitted with appropriate plug. The power cable must be at least 3 metre in length.
6.3	Resettable overcurrent breaker shall be fitted for protection
7	Standards and Safety Requirements
7.1	The unit offered shall be certified to meeting the relevant quality and safety requirements of TUV, CE mark (MDD), USFDA, IEC, Radiation safety, safety of pressurised equipment and any other relevant quality and safety standards .
7.2	Manufacturer must have ISO certification for quality standards.

7.3	7.3 Certified to be compliant with IEC 60601-2-38 Medical Electrical Equipment part 2-38 Particular requirements for safety of Electrically Operated Hospital Beds.
8	User Training
8.1	On site operational training till the familiarity of the system and satisfaction of end user shall be provided.
9	Warranty
9.1	Comprehensive warranty for 2 years.
10	Maintenance Service During Warranty Period
10.1	During the warranty period supplier must ensure corrective/breakdown maintenance whenever required.
11	Documentation
11.1	User (Operating) manual in English
11.2	Service (Technical / Maintenance) manual in English
11.3	12.3 List of important spare parts and accessories with their part numbers and costing.
11.4	12.4 Certificate of calibration and inspection from factory.
11.5	Log book with instruction for daily, weekly, monthly and quarterly maintenance checklist.

ICU Ventilator

No.	Item Specifications
1	Description of Function
1.1	ICU ventilator provides artificial respiratory support to the critical patients in the intensive care units.
2	Operational Requirements
2.1	Microprocessor Controlled ventilator with integrated facility for ventilation monitoring suitable for new-born to adult ventilation.
3	System Configurations
3.1	ICU Ventilator for Infant to Adult, complete unit with all standard accessories.
4	Technical Specifications
4.1	Imported hinged arm holder for holding the circuit.
4.2	Colour TFT screen, 12 Inch or more.
4.3	Facility to measure and display:
	☐ End tidal CO2 with capnography.
	☐ 3 Waves: Pressure & Time, Volume & Time and Flow & Time.
	☐ 3 Loops: P-V, F-V, P-F with facility of saving of 3 loops for reference.
	☐ Graphic display to have automatic scaling facility for waves.
	☐ Status indicator for ventilator mode, battery life, patient data, alarm settings, clock etc.
4.4	Trending facility for 72 hours with minimum 5 minutes resolution for recent 24 hours.
4.5	Automatic compliance & leakage compensation for circuit and ET tube.
4.6	Must have following settings :
	☐ Tidal Volume up to 2000ml.
	☐ Pressure (insp.).
	☐ Pressure Ramp.
	☐ Flow Pattern.
	☐ Respiratory rate up to 100 breaths per minute.
	☐ SIMV Respiratory Rate up to 40 breaths per minute.
	☐ CPAP/PEEP: PEEP 50cmH2O.
	☐ Pressure Support.
	☐ FIO2.
	☐ Pause Time.
	☐ Pressure & Flow Trigger: Pressure Trigger 0-20 cmH2O below PEEP, Trigger Flow 0-100%.
	☐ Inspiratory rise time:-0-20% of breath cycle time.
	☐ I:E Ratio: 1:10 to 4:1
4.7	Monitoring of the following parameters:
	☐ Airway Pressure (Peak & Mean).
	☐ Tidal volume (Inspired & Expired).
	☐ Minute volume (Inspired and Expired).
	☐ Spontaneous Minute Volume.
	☐ Total frequency.
	☐ FIO2 dynamic.
	☐ Intrinsic PEEP and PEEPi volume.
	☐ Plateau pressure.
	☐ Resistance & Compliance.
	☐ Use selector alarms for all measured & monitored parameters.
4.8	Modes of ventilation:
	☐ Volume controlled.
	☐ Pressure controlled.

	☐ Pressure support.
	☐ SIMV (pressure control and volume control) with pressure support.
	☐ CPAP/PEEP.
	☐ Inverse ratio ventilation.
	☐ Advanced mode like pressure controlled volume guaranteed.
	☐ Non Invasive ventilation.
	☐ APRV or equivalent.
	☐ PRVC or equivalent.
4.9	Shall have apnoea /backup ventilation
4.1	Expiratory block must be autoclaveable and no routine calibration is required.
4.11	Shall have the ability to calculate / procedure:
	☐ Intrinsic PEEP & Intrinsic PEEP Volume.
	☐ Occlusion Pressure.
	☐ Spontaneous breathing trial.
	☐ Facility to calculate lower and upper inflection point.
4.12	Nebulizer with capability to deliver particle size of < 3 micron & to be used in both Off and On line
4.13	Shall have automatic patient detection facility.
4.14	Medical Air Compressor:
	☐ Imported standalone medical air compressor.
	☐ Snap fit with the ventilator module to provide an oil free medical air.
	☐ Peak output flow shall be minimum 160 LPM.
	☐ Air quality must comply with ISO compressed air purity class.
	☐ Medical Air Compressor must automatically activate in the event of wall air supply loss.
	☐ Replacement of internal filters must be performed without removing the compressor.
	☐ Must have washable air filter.
4.15	Reusable Face Mask & Nasal Mask:
	☐ Reusable face & nasal mask with textured dual flap silicone cushion flap for easy fit.
	☐ Removable forehead support and pad to match the angle of patient's forehead.
	☐ Stability selector for easy fit and angle.
	☐ Ball & Socket headgear attachments.
	☐ Must be autoclaveable.
4.16	Shall have battery backup for minimum 1 hour.
4.17	RS 232C interface for communications with networked devices.
	5 Accessories, spares and consumables
5.1	Adult, Paediatric and Neonatal reusable, autoclaveable silicon breathing circuits: 02 set each
5.2	Reusable Masks (Small, Medium, and Large): 02 set each.
5.3	Connecting hose with regulator/ flow meter or probe for connection to Pin index oxygen cylinder and BOC type oxygen wall outlet, 3 meter length: 01 set.
5.4	Humidifier: Servo controlled with digital monitoring of inspired gas temperature complete with heating wire: 01 no.
5.5	Filter paper for humidifier for 100 uses.
5.6	O2 cell with O-ring.
5.7	Silicone test lung adult and child size: 01 set each
5.8	Nipple connector 15-10 mm.
5.9	Flow sensors: 05 nos.
5.1	Inspiration bacterial filter, able to filter 99.97% of all 0.3 microns particles: 05 nos.
5.11	Expiration bacterial filter, able to filter 99.97% of all 0.3 microns particles: 05 nos.
5.12	Non corrosive imported trolley with wheels & brakes and hinged arm: 01 no.
5.13	All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer.
	6 Operating Environment
6.1	The product offered shall be designed to be stored and to operate normally under Power Supply, Climate, Temperature, Humidity, etc. for Sudan.
6.2	Power supply: 220 – 240 VAC, 50Hz fitted with appropriate plug. The power cable must be at least 3 metre in length.
	7 Standards and Safety Requirements
7.1	Must submit ISO13485:2003/AC:2007 for Medical Devices AND
7.2	CE (93/42 EEC Directives) or USFDA or TUV approved product certificate.
7.3	Certified to be compliant with ANSI/IEC60601.2.12-01 Medical Electrical Equipment—Part 2-12; Particular Requirements for the Safety of Lung Ventilators—Critical Care Ventilators.
7.4	Must meet IEC 529 Level 3 (IP3X) (spraying water) for enclosure protection, water ingress.
7.5	Certified to be compliant with ISO-7767 for Oxygen monitoring.
	8 User Training
8.1	Must provide user training (including how to use and maintain the equipment).

9	Warranty
9.1	Comprehensive warranty for 2 years after acceptance.
10	Maintenance Service During Warranty Period
10.1	During the warranty period supplier must ensure preventive maintenance and corrective/breakdown maintenance whenever required.
11	Documentation
11.1	User (Operating) manual in English.
11.2	Service (Technical / Maintenance) manual in English.
11.3	List of important spare parts and accessories with their part numbers and costing.
11.4	Certificate of calibration and inspection from factory.

Infusion Pump

No.	Item Specifications
1	A microprocessor controlled infusion pump unit is needed to include but not limited to the following features:
2	Flat hygienic touch screen.
3	Syringe loading sensor – with KVO (keep vein open)
4	Self calibrated, self diagnosis capability
5	Volume range from 1 –999 ml/hr or better in 1 ml increment
6	High accuracy rate< /- 2%
7	Audio visual indicators
8	Multi types A/V alarms to include occlusion, door open, low battery, empty, etc...
9	Open system using standard IV lines
10	Air in line/ fluid detector
11	Built in rechargeable battery, at least two hours operation
12	Clamp pole
13	Input power supply: 220 ± 20 % V AC , 50Hz

Laryngoscope Set

No.	Item Specifications
1	Description of Function
1.1	Laryngoscopy to facilitate tracheal intubation during general anaesthesia or cardiopulmonary resuscitation or for procedures on the larynx or other parts of the upper tracheobronchial tree.
2	Operational Requirements
2.1	Battery powered laryngoscope unit (handle to take C-size batteries).
3	System Configuration
3.1	Laryngoscope set (McIntosh or equivalent)
4	Technical Specifications
4.1	Blades to be made of surgical grade stainless steel.
4.2	Clip-on quick release mechanism for blades, which also provides electrical contact for blade light. Light to be activated when blade is engaged.
4.3	Shall operate on battery.
4.4	Handle/battery unit to be made of non-ferrous metal.
5	Accessories, spares and consumables
5.1	Accessories:
	☐ Spare bulbs: 03 nos.
	☐ Blades: One each of following sizes:
	i-Neonate size 00
	ii-Adult small size 3
	iii-Adult medium size 4
	iv-Adult large size 5
5.2	All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer. Bidders must specify the quantity of every item included in their offer (including items not specified above).
6	Operating Environment
6.1	The product offered shall be designed to be stored and to operate normally under Climate, Temperature, Humidity, etc. for Sudan.
6.2	Battery operated system.
7	Standards and Safety Requirements
7.1	Must submit ISO13485:2003/AC:2007 for Medical Devices AND
7.2	CE (93/42 EEC Directives) or USFDA or TUV approved product certificate.

Monitor (IBP + CO)

No.	Item Specifications
1	Description of Functions
1.1	A bedside patient monitor to monitor physiological parameters of patients in the critical care units or operating theatres.
2	Operational Requirements
2.1	It shall operate on AC power supply as well as built-in battery.
3	System Configurations
3.1	Monitor Patient Bedside 4 chl. colour with ECG/Resp., SpO2, NIBP, Temp, 2IBP, ETCO2 , CO
3.2	All accessories, consumables and etc. required for monitoring of physiological parameters specified herein.
4	Technical Specifications
4.1	High resolution colour flat panel non-reflective screen: > 10" display size for at least 4 channel waveforms display
4.2	Display of up to 4 physiological parameter modules without the need for external devices
4.3	Display waveform: ECG, IBP, SpO2,CO, pulse wave and respiration.
4.4	Numeric data display: heart rate / pulse rate, respiration rate, NIBP (Systolic, Diastolic, Mean), SpO2 and current time of NIBP measurement.
4.5	Use interaction via integrated touch screen, press pad/button or rotary knob.
4.6	With storage of at least 24 hours of trend data in 30-second sampling resolution for all monitored parameters to be displayed graphically and in tabular form.
4.7	Data resolution shall be minimum of 30 second sampling.
4.8	Display of trend:
4.9 a)	Trend tables in at least with 1, 5, 15, 30 or 60 -minute display formats; and
4.1 b)	Trend graphs in at least 1, 2, 4, 8, 12 or 24 -hour display formats
4.11	With storage of events for event recalling, review and documentation. It shall be able to store and record at least 10 events.
4.12	The monitor shall be protected against the interference from the electric cautery and other electrical equipment.
4.13	Despite the technical requirements of the networking capability, the networking works shall not be included in this offer.
4.14	All parameters modules shall work in all monitors within the network and shall be easily interchangeable by the user. There shall be no restriction on the combination of them.
4.15	Parameter required:
4.16	ECG/Respiration with 5 system with cable (1 set) and complete reusable ECG electrodes for Adult & paediatric, 1 set each
4.17	ECG cable and patient cable 5 leads for disposable electrodes, 1 set
4.18	Disposable electrodes for adult, child and infant, 50 pcs each
4.19	Shall come with at least a 2-lead (channel) ST analysis
4.2	With lethal arrhythmia detection : at least with detection & monitoring of asystole, ventricular, fibrillation, and ventricular tachycardia and bradycardia.
4.21	Pulse oximetry SpO2 with adult and child finger transducer, 1 each.
4.22	SpO2 reusable sensor for infant, 1pc.
4.23	Non-invasive blood pressure, NIBP with reusable NIBP Starter Kit
4.24	NIBP connection hose, 1 set
4.25	NIBP cuff & tubing for both adult & child (At least 2 different sizes for adult and 4 different sizes for child/ infant/ neonate)
4.26	Temperature: 2 type of probes required.
4.27	Core temperature probe adult, child & infant, 1 pc each
4.28	Skin Temperature probe, adult/child & infant, 1 pc each
4.29	Invasive blood pressure, IBP for monitoring of 2 IBP
4.3	Shall come with one complete set of IBP reusable accessories
4.31	EtCO2, preferably microstream but at least must be able to perform mainstream and side stream EtCO2 monitoring
4.32	Come with one complete set of EtCO2 flow sensor and accessories for mainstream and side stream monitoring, 1 set each.
4.33	In the case of microstream system, it shall come with one complete set of EtCO2 flow sensor and accessories for side stream monitoring, 1 set
4.34	Come with internal rechargeable Lithium battery complete with built-in charger
4.35	Monitor shall be operated by the battery for at least 60 minutes
4.36	Come with Alarms for all monitored parameters including: exceeding user-selectable upper and lower limits, life threatening alarms, lead/ probe/ sensor disconnection, system failure or error.
4.37	Alarm shall have at least 3 levels: Crisis, Warning, and Advisory
4.38	Alarm notification shall be given by Audible and Visual

4.39	With networking capability to interface with the central monitor
4.4	RS232 port with interface with computer
4.41	System architecture shall be designed such that deactivation or failure of any bedside or central station device on the network shall not disable, inhibit or degrade communication functions among any other devices in the system.
5	Accessories, Spare Parts and Consumables
5.1	All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer.
6	Operating Environment
6.1	The product offered shall be designed to be stored and to operate normally under Power Supply, Climate, Temperature, Humidity, etc. for Sudan.
6.2	Power supply: 220 – 240 VAC, 50Hz fitted with appropriate plug. The power cable must be at least 3 metres in length.
7	Standards & Safety Requirements
7.1	Must submit ISO13485:2003/AC:2007 for Medical Devices AND
7.2	CE (93/42 EEC Directives) or USFDA or TUV approved product certificate.
7.3	Shall meet IEC-60601-1-2:2001 General Requirements of Safety for Electromagnetic Compatibility.
7.4	Shall meet the safety requirements as per IEC 60601-2-27:1994—Medical electrical equipment—Part 2: Particular requirements for the safety of electrocardiographic monitoring equipment.
8	User Training
8.1	The Supplier shall conduct user training for this equipment to enable operators to use the equipment properly. The training shall include the use of all operational functions of the equipment, as well as routine checks and maintenance expected by users.
9	Warranty
9.1	Comprehensive warranty for 2 years.
10	Maintenance Service During Warranty Period
10.1	During the warranty period supplier must ensure planned preventive maintenance (PPM) along with corrective/breakdown maintenance whenever required.
11	Documentation
11.1	User (Operating) manual in English
11.2	Service (Technical / Maintenance) manual in English
11.3	List of important spare parts and accessories with their part numbers and costing.
11.4	Certificate of calibration and inspection from factory.

Oxygen Concentrator

No.	Item Specifications
1	Description of Function
1.1	Oxygen concentrator produces oxygen from ambient air.
2	Operational Requirements
2.1	Integrated Oxygen sensing device (OSD) measures concentration at flow meter entrance.
3	System Configuration
3.1	Oxygen Concentrator set complete with Flow Splitter.
4	Technical Specifications
I	Oxygen Concentrator
4.1	Output flow: max 5 LPM (Litre per minute).
4.2	Flow meter range: 1 to 5 LPM.
4.3	Output pressure: 60 kPa.
4.4	Oxygen concentration: 95% +/- 3% at 1-3 LPM, 92% +/- 3% at 4 LPM, 90% +/- 3% at 5LPM.
4.5	Time to reach 95% the specified performance: 5 minutes.
4.6	Four-step filtering (coarse, pre, inlet and bacterial) of air-intake.
4.7	All filters replaceable, coarse filter washable/reusable.
4.8	Continuous monitoring, with visual and audible alert on:
	☐ Low and high output pressure
	☐ Low oxygen concentration
	☐ Oxygen monitor: amber light on the front illuminates when oxygen concentrator is below 85%. If concentration remains below 85% for more than 15 minutes, an audible alarm sounds.
	☐ Power failure
	☐ Battery test.
4.9	Temperature operating range: 20 to 60 OC.
4.1	Sound level produced: 40 to 50 dB(A).
4.11	Shall have 4 antistatic swivel casters, 2 with brakes and with integrated handle allows for easy moving and positioning.
II	Flow Splitter for Oxygen Concentrator

4.12	Five way split of oxygen flow provided by an oxygen concentrator.
4.13	Each flow can be adjusted individually via its flow meter, range: 0.125 to 2 LPM (Litre per minute).
4.14	The output nozzle can either be fit with tubing or left blank.
4.15	Input pressure: approx. 50 to 350 kPa.
4.16	Flow splitter allows precise distribution of the oxygen output of a concentrator towards 2, 3, 4 or 5 patients, i.e. neonates and infants.
5	Accessories, spares and consumables
5.1	Accessories:
	☐ 2 x Adult cannula, with 2m tubing.
	☐ 4 x Infant/Paediatric cannula, with 2m tubing.
	☐ 4 x New-born cannula, with 2m tubing.
	☐ 3 x Connector for above.
	☐ 4 x Humidifiers.
	☐ 4 x 50' tubing.
	☐ 4 x tubing adapter kit.
	☐ 6 x Spare coarse filters.
	☐ 3 x Spare pre-filters.
	☐ 3 x Spare inlet-filters.
	☐ 3 x Spare bacterial-filters.
5.2	All standard accessories/consumables/parts required for the proper operation of the above item shall be included in the offer.
6	Operating Environment
6.1	The product offered shall be designed to be stored and to operate normally under Power Supply, Climate, Temperature, Humidity, etc. for Sudan.
6.2	Power supply: 220-240VAC, 50Hz fitted with appropriate plug. The power cable must be minimum 3 metres long.
	Power consumption, approx.: 500 W.
7	Standards and Safety Requirements
7.1	Must submit ISO13485:2003/AC:2007 for Medical Devices AND
7.2	CE (93/42 EEC Directives) or USFDA or TUV approved product certificate.
8	User Training
8.1	Must provide user training.
9	Warranty
9.1	Comprehensive warranty for 2 years after acceptance.
10	Maintenance Service During Warranty Period
10.1	During warranty period supplier must ensure corrective/breakdown maintenance whenever required.
11	Documentation
11.1	User (Operating) manual in English.
11.2	Service (Technical / Maintenance) manual in English.
11.3	List of important spare parts and accessories with their part number and costing.
11.4	Certificate of calibration and inspection from factory.

Patient Monitor

No.	Item Specifications
1	Description of Function
1.1	NIBP/Vital Sign Monitor is used to continuously monitor the vital parameters including NIBP of critically ill patients.
2	Operational Requirements
2.1	Capability of storage of patient data and printing of patient reports.
2.2	Capability to integrate with the HIS and transfer the data through LAN / Wireless LAN to any other monitoring room / doctor's desk. Must be HL-7 compatible for transmitting and receiving data to/from LAN/HIS
3	System Configuration
3.1	NIBP/Vital Signs Monitor with complete accessories.
4	Technical Specifications
4.1	Monitoring parameters:- ECG, respiration, NIBP, SPO2 and temperature
4.2	Digital and 6 waves / traces display on minimum 9 inches TFT/LCD Display Screen.
4.3	Monitor must have audible and visual alarms capability. Alarms must have three distinct audible alarm tones to distinguish alarm levels as under. Also monitor must permit automatic viewing of alarming parameter waveform and numeric from any bedside in alarm as and when connected in a network.
4.4	Must include hemodynamic calculations and vital sign and graphic trends. Trends must be automatically stored for at least 24 hours in at least one minute intervals.

4.5	Numeric monitored data shall be viewable and recordable in a patient chart type format in at least 1, 5, 15, 60 minutes intervals.
4.6	Convenient handle for carrying the same
4.7	Able to fix with bed/trolley.
4.8	Inbuilt rechargeable battery for minimum 3 hours of operation.
5	Accessories, spares and consumables
5.1	Accessories:
	☐ Patient cable -01 no.
	☐ Adult Cuff – 01 no.
	☐ Paediatric Cuff -01 no.
	☐ Adult Probe SPO2 -02 nos.
	☐ Paediatric Probe SPO2 -02 nos.
	☐ Skin Temp Probe -02 nos.
5.2	All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer.
6	Operating Environment
6.1	The product offered shall be designed to be stored and to operate normally under Power Supply, Climate, Temperature, Humidity, etc. for Sudan.
6.2	Power supply: 220 – 240 VAC, 50Hz fitted with appropriate plug. The power cable must be at least 3 metre in length.
7	Standards and Safety Requirements
7.1	Must submit ISO13485:2003/AC:2007 for Medical Devices AND
7.2	CE (93/42 EEC Directives) or USFDA or TUV approved product certificate.
7.3	Shall meet IEC-60601-1-2:2001 General Requirements of Safety for Electromagnetic Compatibility or must comply with 89/366/EEC; EMC directive.
7.4	Shall meet the safety requirements as per IEC 60601-2-27:1994—Medical electrical equipment—Part 2: Particular requirements for the safety of electrocardiographic monitoring equipment.
8	User Training
8.1	Must provide user training (including how to use and maintain the equipment).
9	Warranty
9.1	Comprehensive warranty for 2 years from acceptance.
10	Maintenance Service During Warranty Period
10.1	During the warranty period supplier must ensure planned preventive maintenance (PPM) and corrective/breakdown maintenance whenever required.
11	Documentation
11.1	User (Operating) manual in English
11.2	Service (Technical / Maintenance) manual in English
11.3	List of important spare parts and accessories with their part number and costing.
11.4	Certificate of calibration and inspection from factory.

Patient Monitor with full Parameters

1	Description of Function
1.1	Modular Multi parameter Monitor is used to monitor vital parameter of critical patients.
2	Operational Requirements
2.1	Capability of storage of patient data and printing of patient reports.
3	System Configuration
3.1	Vital multi-parameter monitor to monitor and display - ECG, Respiration, NIBP, SPO2, CO2 with capnography, Temp, Cardiac output, NMT, BIS/Entrop, EEG, Gastrictonometry & IBP and with complete accessories.
4	Technical Specifications
4.1	Minimum 15 inches multi colored TFT display screen.
4.2	Separate CPU/Module rack.
4.3	Eight digital and waveforms/traces display
4.4	Combination of single, dual and multi parameter modules.
4.5	Parameter modules freely exchangeable between all the monitors.
4.6	Multi channel (up to 12 leads) ST segment analysis.
4.7	Facility to monitor and display - ECG, Respiration, NIBP, SPO2, CO2 with capnography, Temp, Cardiac output , NMT , BIS/Entropy , EEG, Gastrictonometry & IBP – 2 nos.
4.8	Automatic arrhythmia detection & alarm for standard and lethal arrhythmia.
4.9	EtCO2 -Main stream/ side stream. Display both inspired and expired values, showing capnography.
4.10	NMT Module/monitor: For measurement and display of TOF count, TOF %, ST, DBS, Tetanic and Trend for continuous usage.
4.11	Automatic measurement facility in selected time interval.

4.12	Automatic selection of supramaximal current. Include standard accessories.
4.13	EEG Module with all accessories.
4.14	Must provide hemodynamic, oxygenation, Ventilation calculation package
4.15	Trend of at least 48 hours.
4.16	200 nos. event recall/snapshot facility both manually and automatically triggered by alarm.
4.17	Automatic Zoom In Facility in the monitor display.
4.18	The monitors must have monitor-to-monitor overview facility and data transfer over the network.
4.19	Must have drug calculation package.
4.2	Web browsing facility to review each networked monitors data through hospital LAN via office PC in Hospital LAN Network and/or through dial up facility from remote location.
4.21	Communications with Information Management Systems:
	A. To provide HL-7 compatible server for sending and receiving information to and from the monitoring network to and from Hospital Information System, Laboratory information etc for integration of various information
	B. To provide suitable facility for sending and receiving DICOM compatible Radiological Images like Ultrasound, X-Ray etc. to and from the monitoring network to and from Hospital Information System, Radiology Information System etc. for integration of various information .
4.22	Integrated or external printer for report output.
5 Accessories, spares and consumables	
5.1	Accessories:
	☐ ECG/Resp: 5 Lead ECG Cable with clip- 2 sets per monitor and 10 Lead ECG Cable with clip- 1 set per monitor.
	☐ Temperature: Rectal temperature probe- two per monitor and skin temperature probe- one per monitor.
	☐ NIBP: Adult cuff- 2nos. per monitor and two sizes of paediatric cuffs- one per monitor (complete sets)
	☐ EtCO2 module with all accessories. In case of side stream EtCO2- 10 sets of sampling tubes for each module to be included.
	☐ SPO2: Adult SPO2 sensor with cable- two nos. per monitor and Paediatric SPO2 sensors one no. per monitor.
	☐ Cardiac Output: Must be by thermodilution method with all accessories
	☐ IBP: Include four nos. per monitor of reusable pressure transducer with bracket, holder and 100 nos. disposable domes per monitor.
	☐ EEG Modules- with all accessories. Must display at least two channels .
	☐ BIS/Entropy Module: Adult Sensors-200 numbers. Spectral analysis modules by compressed spectral array .
	☐ Necessary cabling for networking the monitors on turnkey basis.
	☐ Necessary mounting solution/ mounting on any pendant for monitors
5.2	All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer. Bidders must specify the quantity of every item included in their offer (including items not specified above).
6 Operating Environment	
6.1	The system offered shall be designed to operate normally under the conditions of the purchaser's country. The conditions include Power Supply, Climate, Temperature, Humidity, etc. 6.2 Power supply: 220 – 240 VAC, 50Hz fitted with appropriate plug. The power cable must be at least 3 metre in length.
7 Standards and Safety Requirements	
7.1	Must be USFDA, CE (93/42 EEC Directives), UL or TUV approved product
7.2	This unit shall be certified to meet ISO9001 and/or ISO14971 and/or ISO 13485:2003/AC: 2007.
7.3	Shall meet IEC-60601-1-2:2001 General Requirements of Safety for Electromagnetic Compatibility or must comply with 89/366/EEC; EMC directive
7.4	Shall meet the safety requirements as per IEC 60601-2-27:1994—Medical electrical equipment—Part 2: Particular requirements for the safety of electrocardiographic monitoring equipment.
8 User Training	
8.1	Must provide user training (including how to use and maintain the equipment).
9 Warranty	
9.1	Comprehensive warranty for 2 years from acceptance.
10 Maintenance Service During Warranty Period	
10.1	During the warranty period supplier must ensure planned preventive maintenance (PPM) and corrective/breakdown maintenance whenever required.
11 Installation and Commissioning	
11.1	The bidder must arrange for the equipment to be installed and commissioned by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.
12 Documentation	
12.1	User (Operating) manual in English
12.2	Service (Technical / Maintenance) manual in English
12.3	List of important spare parts and accessories with their part number and costing.

12.4	Certificate of calibration and inspection from factory.
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Pulse Oximeter

No.	Item Specifications
1	Description of Function
1.1	A pulse Oxymeter is a medical device that indirectly measures the amount of oxygen in a patient's blood (as opposed to measuring oxygen saturation directly through a blood sample) and changes in blood volume in the skin, producing a photoplethysmography.
2	Operational Requirements
2.1	Suitable for all types of patient range, adult, paediatric and infant and shall operate on AC mains as well as from internal rechargeable battery.
3	System Configuration
3.1	Pulse Oxymeter, complete unit with all standard accessories.
4	Technical Specifications
4.1	It shall be portable unit.
4.2	Display- LCD, backlight illuminated.
4.3	Parameters and waveform displayed- SpO2, pulse rate, system status, plethysmogram, menus for user settings.
4.4	SPO2 range: 70-100 %.
4.5	Accuracy of SPO2: 3%.
4.6	Pulse rate range must be 30-240 bpm.
4.7	Audio-visual alarms: High/low SpO2 and pulse rate, sensor off, sensor failure, low battery.
4.8	Shall have alarm override facility.
4.9	It must be suitable to operate in the presence of potentially flammable anaesthetic gases, and it shall not cause fire or explosion during operations.
4.1	RS 232C interface for data communication.
4.11	Shall have integrated printer.
4.12	Inbuilt rechargeable battery and shall have battery back-up for at least 4 hours. Battery charger along with AC adaptor to be provided if integrated charger is not there.
5	Accessories, spares and consumables
5.1	Accessories:
	☐ Reusable adult SpO2 sensor with cable: 02 nos.
	☐ Reusable paediatric SpO2 sensors: 01 no.
	☐ Reusable infant SpO2 sensor: 01 no.
5.2	All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer.
6	Operating Environment
6.1	The product offered shall be designed to be stored and to operate normally under Power Supply, Climate, Temperature, Humidity, etc. for Sudan.
6.2	Power supply: 220 – 240 VAC, 50Hz fitted with appropriate plug. The power cable must be at least 3 metre in length.
7	Standards and Safety Requirements
7.1	Must submit ISO13485:2003/AC:2007 for Medical Devices AND
7.2	CE (93/42 EEC Directives) or USFDA or TUV approved product certificate.
7.3	Electrical safety conforms to standards for electrical safety IEC 60601-1 General requirement for Electrical safety of Medical Equipment.
8	User Training
8.1	Must provide user training (including how to use and maintain the equipment).
9	Warranty
9.1	Comprehensive warranty for 2 years after acceptance.
10	Maintenance Service During Warranty Period
10.1	During warranty period supplier must ensure preventive maintenance and corrective/breakdown maintenance whenever required.
11	Documentation
11.1	User (Operating) manual in English.
11.2	Service (Technical / Maintenance) manual in English.
11.3	List of important spare parts and accessories with their part numbers and costing.
11.4	Certificate of calibration and inspection from factory.

Syringe Pump

No.	Item Specifications
1	Description of Function

1.1	The Syringe Infusion Pump provides uniform flow of fluid by precisely driving the plunger of a syringe down its barrel. It provides accurate and continuous flow rate for precise delivery of I.V. medication in critical medical care.
2 Operational Requirements	
2.1	The syringe pump must be programmable, user friendly, safe to use and must have battery backup and comprehensive alarm system. This must be able to integrate in the HIS.
3 System Configuration	
3.1	Syringe infusion pump with battery backup alarm and with complete accessories.
4 Technical Specifications	
4.1	Flow rate programmable from 0.1 to 200 ml/hr. or more in steps of 0.1 ml/hr. with user selectable flow set rate option. SAVE last infusion rate even when the AC power is switched OFF.
4.2	Bolus rate must be programmable to 400 – 500 ml/hr. or more with infused volume display. Reminder audio after every 0.5 ml delivered bolus. SAVE last Bolus rate even when the AC power is switched OFF.
4.3	Display of Drug Name with a provision of memorizing 10~15 names by the operator
4.4	Keep Vein Open (KVO) must be available 1.0 ml/hr. or set rate if lower than 1.0 ml. User must have choice to disable KVO whenever desired.
4.5	Selectable Occlusion pressure trigger levels selectable from 300/500/900 mmHg
4.6	Must Work on commonly available 20, 50/60 ml Syringes with accuracy of minimum of +/-2% or better.
4.7	Automatic detection of syringe size & proper fixing. Must provide alarm for wrong loading of syringe such as flanges out of slot; disengaged plunger, unsecured barrel etc.
4.8	Anti-bolus system to reduce pressure on sudden release of occlusion
4.9	Must have comprehensive alarm package including; Occlusion limit exceed alarm ,Near end of infusion pre-alarm & alarm, Volume limit pre-alarm & alarm, KVO rate flow, Low battery pre-alarm and alarm, AC power failure, Drive disengaged and preventive maintenance.
4.1	Rechargeable Battery having at least 5~6 hour backup for about 5ml/hr. flow rate with 50ml syringes. Larger battery life and indication of residual life will be preferred.
5 Accessories, spares and consumables	
5.1	Accessories:
	☐ Mounting device/ Docking Station for two or four pumps as per requirement so as to enable to power up to 2-4 pumps with one power cord when mounted on IV pole. -01 pc.
5.2	All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer. Bidders must specify the quantity of every item included in their offer (including items not specified above).
6 Operating Environment	
6.1	The product offered shall be designed to be stored and to operate normally under Power Supply, Climate, Temperature, Humidity, etc. for Sudan.
6.2	Power supply: 220 – 240 VAC, 50Hz fitted with appropriate plug. The power cable must be at least 3 metre in length.
7 Standards and Safety Requirements	
7.1	Must submit ISO13485:2003/AC:2007 for Medical Devices AND
7.2	CE (93/42 EEC Directives) or USFDA or TUV approved product certificate.
7.3	Certified for meeting IEC60601-2-24:Particular requirements for the safety of infusion pumps and controllers
7.4	Must meet IEC 529 Level 3 (IP3X) (spraying water) for enclosure protection, water ingress.
8 User Training	
8.1	Must provide user training (including how to use and maintain the equipment).
9 Warranty	
9.1	Comprehensive warranty for 2 years.
10 Maintenance Service During Warranty Period	
10.1	During the warranty period supplier must ensure corrective/breakdown maintenance whenever required.
11 Documentation	
11.1	User (Operating) manual in English.
11.2	Service (Technical / Maintenance) manual in English
11.3	List of important spare parts and accessories with their part number and costing.
11.4	Certificate of calibration and inspection from factory.

Vital Sign Monitor

No.	Item Specifications
1 Description of Function	
1.1	NIBP Monitor measures and displays Blood Pressure values with inflation of the cuffs and is non-invasive in operation.
2 Operational Requirements	
2.1	Compatible for use in new-borns to adults.
3 System Configuration	

3.1	NIBP Monitor light weight, portable and with all standard accessories.
4 Technical Specifications	
4.1	The monitor must be compact in size, light weight and portable.
4.2	Measurement method: Oscillometric using linear deflation.
4.3	Pressure detection: Conductor pressure sensor
4.4	Continuously display of BP (systolic, diastolic, mean and pulse rate at intervals of 2, 3,5,10,15,20,30 up to 180 minutes).
4.5	Shall have facility of self-check system/self-test.
4.6	Pressure: 00 to 300 mm of Hg, Accuracy: + - 5 mm with standard deviation not greater than 8 mm of Hg.
4.7	Pulse range: 40 -240 /minute, accuracy: +/- 2%.
4.8	Patient alarms :
	☐ Systolic upper limit-60 -240 and lower limit 20-160 mm of Hg.
	☐ MAP (Mean Arterial Blood Pressure) upper limit: 60 -200 mmHg and lower limit 20 -120 mmHg.
	☐ DIA upper limit-50 -180 and lower limit 15-120 mm of Hg.
	☐ P.R upper limit-80 -220 and lower limit 40 -140/minute.
4.9	Memory: 400 measurement capacity.
4.1	Printer facility with oscillometric graph of BP and pulse level.
4.11	Supplied with various sizes of cuffs from neonate to paediatric ranges e.g. 2.5cm, 3.0 cm, 4.0 cm, 5.0 cm, 9 cm, 12 cm and 14 cm.
4.12	Auto cuff deflation in case of over pressure (140 mm of Hg in case of neonatal mode).
4.13	Auto zero facility.
4.14	Stat mode for critical situation for rapid reading for 5 minutes with a 10 second pause.
4.15	Self-diagnostic facility for air leak, application error, dead battery, motion, over pressure, patient alarm, time out and weak signal.
4.16	Display: Colour LCD display.
5 Accessories, spares and consumables	
5.1	Shall supply adult, paediatric and infant sizes of BP cuffs two of each size.
5.2	All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer.
6 Operating Environment	
6.1	The product offered shall be designed to be stored and to operate normally under Power Supply, Climate, Temperature, Humidity, etc. for Sudan.
6.2	Power supply: 220 – 240 VAC, 50Hz fitted with appropriate plug. The power cable must be at least 3 metres in length.
7 Standards and Safety Requirements	
7.1	Must submit ISO13485:2003/AC:2007 for Medical Devices AND
7.2	CE (93/42 EEC Directives) or USFDA Or TUV approved product certificate.
7.3	Electrical safety conforms to standards for electrical safety IEC 60601-1 General requirement for Electrical safety of Medical Equipment.
8 User Training	
8.1	Must provide user training (including how to use and maintain the equipment).
9 Warranty	
9.1	Comprehensive warranty for 2 years after acceptance.
10 Maintenance Service during Warranty Period	
10.1	During warranty period supplier must ensure corrective/breakdown maintenance whenever required.
11 Documentation	
11.1	User (Operating) manual in English.
11.2	Service (Technical / Maintenance) manual in English.
11.3	List of important spare parts and accessories with their part number and costing.
11.4	Certificate of calibration and inspection from factory.

Anesthesia Machine

No.	Item Specifications
1 Description of Functions	
1.1	It shall be an anaesthesia unit with pneumatically or electrically powered and electrically controlled ventilator.
2 Operational Requirements	
2.2	It shall be suitable to be used for adult and paediatric patients.
3 System Configurations	
3.1	It shall come with the main unit and two vaporizers, one for isoflurane and the other for halothane.
4 Technical Specifications	
4.1	Equipment safety standard should follow IEC 60601, document evidence shall be submitted for evaluation

4.2	On sturdy steel with anticorrosive powder coating trolley running on four antistatic wheels with brakes and drawers
4.3	Revolving support for possible inclusion of CO2 absorber.
4.4	Gas inlet: 3 inlets, O2, N2O and Air
4.5	Gas cylinder yokes: O2 & N2O
4.6	Should come with accessories for connecting gas supply both from central supply as well as from cylinders.
4.7	Flow meter:
4.8	It shall come with 6 flow meter columns; 2 flow meter columns for each kind of gas; which 1 column with normal increments and 1 column with small adjustments.
4.9	The oxygen flow meter shall have adjustment ranges: 1 column approximately from 0 to 1 L/min and the other column approximately from 1 to 10 L/min
4.10	The Nitrous oxide flow meter shall have adjustment ranges: 1 column approximately from 0 to 1 L/min and the other column approximately from 1 to 10 L/min
4.11	The air flow meter shall have adjustment ranges: 1 column approximately from 0 to 1 L/min and the other column approximately from 1 to 10 L/min
4.12	O2, N2O and air pressure gauges
4.13	Battery backup for not less than 90 minutes of operation
4.14	Autoclaveable CO2 absorbent canister with minimum 2.5kg soda lime.
4.15	All circuits shall be detachable, washable and Autoclaveable at most with steam of 134 degree C
4.16	Vaporizer
4.17	Type of vaporiser : shall be concentration calibrated type, such as variable bypass or heated blender or equivalent
4.18	It shall accommodate two vaporizers.
4.19	Come with 2 sets of concentration calibrated type vaporizers and two sets of compatible fillers for one for isoflurane and the other for halothane.
4.20	Stainless steel supporting arm with two articulations and rail clamp
4.21	Vaporizer is to be maintenance free with easy re-filling
4.22	Gas flow control or Oxygen ratio control
4.23	The N2O and O2 flow control shall be interlocked that the proportion of O2 to N2O will never fall below a minimum value, i.e. O2 concentration shall never be less than 25%, to produce a hypoxic breathing mixture.
4.24	It shall automatically cut off the supply of N2O and other gases and activate an alarm if O2 pressure drops below 28 - 30PSI, It shall sounds at maximum volume every 10 seconds
4.25	Ventilator
4.26	Microprocessor based electrically powered and electrically controlled ventilator
4.27	Operating modes: Manual, spontaneous, VCV
4.28	Tidal Volume: approximately 50 - 1200 ml
4.29	Breathing frequency: approximately 5 - 60 breath/min
4.30	Inspiratory flow: approximately 5 - 70 L/min
4.31	Pressure limitation : approximately 10 - < 70 cm H2O
4.32	PEEP (positive end-expiratory pressure): approximately 0 - 20 cm H2O
4.33	Monitoring
4.34	Alarms shall be available for all vital parameters and system error or failure of at least the following
a	Concentration of O2
b	Expiratory volume and flow
c	High and low airways pressure
d	Pressure high, low or leakage
e	Low gas supply pressure
f	Power failure, low battery, patient disconnection and others
5	Accessories, Spare Parts and Consumables
5.1	All standard accessories/consumables/parts required for the proper operation of the above item shall be included in the offer.
5.2	All standard Maintenance tools and cleaning /lubrication materials where applicable shall be included.
5.3	Silicone breathing circuit for adult and child, 2 complete sets each.
5.4	Connecting hose with regulator/ flow meter or probe for connection to PIN index oxygen cylinder and BOC type oxygen wall outlet, at least 5 meter length, 1 set
5.5	Connecting hose with regulator/ flow meter or probe for connection to N2O cylinder or N2O wall outlet, at least 5 meter length, 1 set
5.6	Connecting hose with regulator/ flow meter or probe for connection to air cylinder or wall outlet, at least 5 meter length, 1 set
5.7	Silicone test lung adult and child size, 1 set each
5.8	Silicone rubber anaesthesia face mask adult and paediatric size, 1 pc each
5.9	O2 sensor, 1 set
6	Operating Environment

6.1	Power supply: 220 – 240 VAC, 50Hz fitted with appropriate plug. The power cable must be at least 3 metres in length.
7	Standards & Safety Requirements
7.1	This unit shall be certified to meet ISO9001 and ISO14971 and ISO 13485:2003/AC: 2007 or Directive 93/42/EEC and its subsequent additional Directives amending to it or equivalent. Certificates showing the compliance of this unit offered with any relevant quality and safety standards MUST be submitted with this TSF.
8	User Training:
8.1	The Supplier shall conduct user training for this equipment to enable operators to use the equipment properly. The training shall include the use of all operational functions of the equipment, as well as routine checks and maintenance expected by users.
9	Warranty
9.1	The warranty period for this item shall be 24 months after acceptance of the Goods
10	Maintenance Service During Warranty Period
10.1	Preventive and corrective maintenance services during warranty period shall be included.
11	Documentation
11.1	It must be supplied with detailed operating and maintenance manuals and technical information in the English language

Patient Trolley

No.	Item Specifications
1 Description of Function	
1.1	A trolley for transportation of a patient in the hospital.
2 Operational Requirements	
2.1	It shall be constructed fully with anti-corrosive and antirust treated epoxy powder coated steel sheet and tube or better.
3 System Configuration	
3.1	Patient trolley with handles and four swivels castors.
4 Technical Specifications	
4.1	Overall size: approximately 2030 L x 560 W x 820 H mm
4.2	Welded tubular frame with box type pattern construction.
4.3	Dished shaped top, push handles to be fitted at both ends. The dished shaped top surface shall be smooth and corrosive and rust resistance.
4.4	Shall be mobile on 4 x 200mm robust swivelling castors with non-marking grey tyres and with at least 2 diagonal castors shall have locking/brake mechanism. All four wheels MUST be fully 360 deg. swivels. Fixed direction wheels are NOT acceptable.
4.5	To be supplied complete with patient transfer board. Smooth board in either heavy duty mild steel or Aluminium Approx. size 1500 l x 500 w mm. All edges shall be rounded /curved finished. Surface to be smooth to permit easy sliding of patient onto trolley.
5 Accessories, spares and consumables	
5.1	All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer.
6 Operating Environment	
6.1	The product offered shall be designed to be stored and to operate normally under Climate, Temperature, Humidity, etc. for Sudan.
7 Warranty	
7.1	Comprehensive warranty for 2 years after acceptance.

Suction Machine

No.	Item Specifications
1 Description of Function	
1.1	To extract fluid from the body during surgery or emergency treatment.
2 Operational Requirements	
2.1	Shall operate on mains AC supply .
3 System Configuration	
3.1	The system consists of:
	☐ Suction machine with 2 Jar.
	☐ Suction tubing.
	☐ Two bottles.
4 Technical Specifications	
4.1	The machine shall be portable on four wheels and with a handle for transportation.

4.2	The vacuum pump must be totally oil-free diaphragm type. Must have maintenance free pumps of international design for continuous use.
4.3	Motor shall be of Class "F" insulation to operate in ambient temperature to withstand up to 50 oC, with thermal cut-outs.
4.4	To facilitate maintenance, the cover of the machine must be easy to open from the top & sides.
4.5	The suction machine must be capable of producing minimum vacuum of approx. 700 mm Hg and which must be adjustable and monitored by vacuum gauge of suitable range. The suction capacity must be 25 litres per minute and can be regulated.
4.6	It must have two bottles of 2L each . Each made of unbreakable polycarbonate with ABS Lid with float (over flow control device).The jars must be graduated (in cc levels). The suction bottles shall be autoclaveable.
4.7	On/Off Switch and power indicator must be available.
4.8	Shall provide foot switch.
4.9	Body material:
	Base, top & panel made of rust proof and corrosion resistant moulded ABS.
5	Accessories, spares and consumables
5.1	Accessories:
	☐ Spare bottle: 02 nos.
	☐ Lids: 02 nos.
	☐ Rubber Seals: 02 nos.
	☐ Blades: 02 nos.
	☐ Suction tubing set at least 5 metres: 02 nos.
	☐ Spare fuse: 01 set.
	☐ Bacterial filter : 05 nos.
5.2	All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer.
6	Operating Environment
6.1	The product offered shall be designed to be stored and to operate normally under Power Supply, Climate, Temperature, Humidity, etc. for Sudan.
6.2	Power supply: 220 – 240 VAC, 50Hz fitted with appropriate plug. The power cable must be at least 3 metre in length.
7	Standards and Safety Requirements
7.1	Must submit ISO13485:2003/AC:2007 for Medical Devices AND
7.2	CE (93/42 EEC Directives) or USFDA or TUV approved product certificate.
7.3	Electrical safety conforms to standards for electrical safety IEC 60601-1 General requirement for Electrical safety of Medical Equipment.
8	User Training
8.1	Must provide user training (including how to use and maintain the equipment).
9	Warranty
9.1	Comprehensive warranty for 2 years after acceptance.
10	Maintenance Service During Warranty Period
10.1	During warranty period supplier must ensure corrective/breakdown maintenance whenever required.
11	Documentation
11.1	User (Operating) manual in English.
11.2	Service (Technical / Maintenance) manual in English.
11.3	List of important spare parts and accessories with their part numbers and costing.
11.4	Certificate of calibration and inspection from factory.

Autoclave (50 L)

No.	Item Specifications
1	Description of Function
1.1	Autoclaves are required for sterilizing an object in high temperature and high pressure steam.
2	Operational Requirements
2.1	Microprocessor based electrically heated vertical steam sterilizer
3	System Configuration
3.1	Microprocessor based Autoclave (Vertical Model) with complete accessories.
4	Technical Specifications
	capacity: approx. 50 L.
	Vertical type.
	Stainless steel.
	Digital controlled temperature and pressure system.
	Steam sterilization, up to 135° C
	Digital temperature and pressure gauges.

	Safety devices : over heat (low water cut-off switch , safety valve and release valve)
	Automatic controlled sterilization cycle.
	2 modes sterilization (121°C - 134°C)
	Exhaust system.
	Stainless steel basket.
	Double wall case.
5	Accessories, spares and consumables
	Spare heating element- 2 set
	All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer.
6	Operating Environment
6.1	The product offered shall be designed to be stored and to operate normally under Climate ,Temperature , Power supply , Humidity, etc. for Sudan.
	Power supply: 220-240V/ 50 Hz AC Single phase with appropriate plug .The power cable must be minimum 3 Meter
7	Standards and Safety Requirements
7.1	Must submit ISO 9001 or ISO13485:2003/AC:2007 for Medical Devices AND
7.2	CE or USFDA approved product certificate.
	Shall meet IEC 61010-2-040 Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-040: Particular requirements for sterilizers and washer-disinfectors used to treat medical materials.
8	Warranty
8.1	Comprehensive warranty for 2 years.
9	Maintenance Service During Warranty Period
9.1	During warranty period supplier must ensure corrective/breakdown maintenance whenever required.
10	Installation and Commissioning
10.1	The supplier must accomplish proper commissioning of the item onsite.
11	Documentation
11.1	User and/or service manual shall be supplied in English.
11.2	User (Operating) manual in English
11.3	Service (Technical / Maintenance) manual in English
11.4	List of important spare parts and accessories with their part numbers and costing.
11.5	Certificate of calibration and inspection from factory.

Autoclave 80L

No.	Item Specifications
1	Description of Function
1.1	Autoclaves are required to sterilize objects under high temperature and pressured steam.
2	Operational Requirements
2.1	Suitable for hospital dressings, linen, surgical instruments, glassware, culture media and laboratory wares etc.
3	System Configuration
3.1	Autoclave for CSSD (Central Sterile Services Department) approx. 80l, stand alone
4	Technical Specifications
4.1	Single door high pressure steam sterilizer with double / triple walled, steam jacket and separate boiler
4.2	Material of construction:
	☐ Sterilizer chamber SS 316
	☐ Door SS 316
	☐ Jacket Stainless Steel
	☐ Loading carriage SS 316
	☐ Door Gasket : Silicon or better
	☐ Insulation: fibre glass resin bonded wool or better
	☐ Insulation cover: SS sheets
4.3	Operating temperature 121 0C – 138 0C pressure 1.1 to 2.2 kg/cm2 of steam pressure
4.4	Capacity- 80 litres
4.5	Digital microprocessor based PID temperature controller with stored memory
4.6	Separate cycle timer and easy to read display pressure gauges.
4.7	Indicating lights display all functions including heating, low water, timer operation, temperature set point and actual temperature.
4.8	Spring loaded safety valves and automatic vacuum breaker for jacket.
4.9	Removable plug screen for chamber drain.
4.1	SS baffle for even steam distribution in the chamber.
4.11	Safety lock for door: pressure lock safety device.

4.12	Low water off.
4.13	Earth leakage breaker (ELB)
4.14	Must include chart recorder for temperature and pressure, increased power rating for rapid heating applications.
4.15	Electrical heating element to have over-temperature protection/cut out and maximum electrical power must not to exceed 4.5 KW.
5	Accessories, spares and consumables
5.1	Accessories:
	☐ 3 dressing drums – (seamless stainless steel construction, suitable to fit into the autoclave)
	☐ A minimum of two spare lid gaskets
5.2	All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer.
6	Operating Environment
6.1	The product offered shall be designed to be stored and to operate normally under Power Supply, Climate, Temperature, Humidity, etc. for Sudan.
6.2	Power supply: 220 – 240 VAC, 50Hz fitted with appropriate plug. The power cable must be at least 3 metre in length.
7	Standards and Safety Requirements
7.1	Must submit ISO 9001 or ISO 13485:2003/AC:2007 AND
7.2	CE (93/42 EEC Directives) or USFDA or TUV approved product certificate.
7.3	Electrical safety conforms to standards for electrical safety IEC-60601.
8	User Training
8.1	Must provide user training (including how to use and maintain the equipment).
9	Warranty
9.1	Comprehensive warranty for two year.
10	Maintenance Service During Warranty Period
10.1	During the warranty period supplier must ensure corrective/breakdown maintenance whenever required.
11	Documentation
11.1	User (Operating) manual in English
11.2	Service (Technical / Maintenance) manual in English
11.3	List of important spare parts and accessories with their part number and costing.
11.4	Certificate of calibration and inspection from factory.

Autoclave (Small)18L

No.	Item Specifications
1	Description of Function
1.1	Autoclaves are required for sterilizing an object in high temperature and high pressure steam.
2	Operational Requirements
2.1	Microprocessor based electrically heated steam sterilizer
3	System Configuration
3.1	Microprocessor based Autoclave with complete accessories.
4	Technical Specifications
	capacity: approx. 18 L.
	Stainless steel.
	Digital controlled temperature and pressure system.
	Steam sterilization, up to 135° C
	Digital temperature and pressure gauges.
	Safety devices : over heat (low water cut-off switch , safety valve and release valve)
	Exhaust system.
	Stainless steel basket.
	Double wall case.
5	Accessories, spares and consumables
	Spare heating element- 2 set
	All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer.
6	Operating Environment
6.1	The product offered shall be designed to be stored and to operate normally under Climate ,Temperature , Power supply , Humidity, etc. for Sudan.
	Power supply: 220-240V/ 50 Hz AC Single phase with appropriate plug .The power cable must be minimum 3 Meter.
7	Standards and Safety Requirements
7.1	Must submit ISO 9001 or ISO13485:2003/AC:2007 for Medical Devices AND

7.2	CE or USFDA approved product certificate.
	Shall meet IEC 61010-2-040 Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-040: Particular requirements for sterilizers and washer-disinfectors used to treat medical materials.
8	Warranty
8.1	Comprehensive warranty for 2 years.
9	Maintenance Service During Warranty Period
9.1	During warranty period supplier must ensure corrective/breakdown maintenance whenever required.
10	Installation and Commissioning
10.1	The supplier must accomplish proper commissioning of the item onsite.
11	Documentation
11.1	User and/or service manual shall be supplied in English.
11.2	User (Operating) manual in English.
11.3	Service (Technical / Maintenance) manual in English.
11.4	List of important spare parts and accessories with their part numbers and costing.
11.5	Certificate of calibration and inspection from factory.

Autoclave 150 L

No.	Item Specifications
1	Description of Function
1.1	Autoclaves are required to sterilize objects under high temperature and pressured steam.
2	Operational Requirements
2.1	Suitable for hospital dressings, linen, surgical instruments, glassware, culture media and laboratory wares etc.
2.2	Horizontal electrically heated autoclave is required.
3	System Configuration
3.1	Autoclave for CSSD (Central Sterile Services Department) approx. 150 L , stand alone .
4	Technical Specifications
4.1	Single door high pressure steam sterilizer with double / triple walled, steam jacket and separate boiler
4.2	Material of construction:
	☐ Sterilizer chamber SS 316
	☐ Door SS 316
	☐ Jacket Stainless Steel
	☐ Loading carriage SS 316
	☐ Door Gasket : Silicon or better
	☐ Insulation: fibre glass resin bonded wool or better
	☐ Insulation cover: SS sheets
4.3	Operating temperature 121 0C – 138 0C pressure 1.1 to 2.2 kg/cm2 of steam pressure.
4.4	Capacity- 150 litres.
4.5	Digital microprocessor temperature controller with stored memory.
4.6	Separate cycle timer and easy to read display pressure gauges.
4.7	Indicating lights display all functions including heating, low water, timer operation, temperature set point and actual temperature.
4.8	Spring loaded safety valves and automatic vacuum breaker for jacket.
4.9	Removable plug screen for chamber drain.
4.1	SS baffle for even steam distribution in the chamber.
4.11	Safety lock for door: pressure lock safety device.
4.12	Low water off.
4.13	Earth leakage breaker (ELB).
4.14	Must include chart recorder for temperature and pressure, increased power rating for rapid heating applications.
4.15	Electrical heating element to have over-temperature protection/cut out.
5	Accessories, spares and consumables
5.1	Accessories:
	☐ 3 dressing drums – (seamless stainless steel construction, suitable to fit into the autoclave).
	☐ A minimum of two spare lid gaskets.
5.2	All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer.
6	Operating Environment
6.1	The product offered shall be designed to be stored and to operate normally under Power Supply, Climate, Temperature, Humidity, etc. for Sudan.
6.2	Power supply: 380-440 V (3 Phase), 50Hz fitted with appropriate plug.
7	Standards and Safety Requirements

7.1	Must submit ISO 9001 or ISO 13485:2003/AC:2007 AND
7.2	CE (93/42 EEC Directives) or USFDA or TUV approved product certificate.
7.3	Electrical safety conforms to standards for electrical safety IEC-60601.
8 User Training	
8.1	Must provide user training (including how to use and maintain the equipment).
9 Warranty	
9.1	Comprehensive warranty for two years.
10 Maintenance Service During Warranty Period	
10.1	During the warranty period supplier must ensure corrective/breakdown maintenance whenever required.
11 Documentation	
11.1	User (Operating) manual in English
11.2	Service (Technical / Maintenance) manual in English
11.3	List of important spare parts and accessories with their part number and costing.
11.4	Certificate of calibration and inspection from factory.

Ceiling Operating Lamp

No.	Item Specifications
1 Description of Function	
1.1	These lights provide cool, shadow free light and have special technology and filters to provide the same.
2 Operational Requirements	
2.1	A major operating light, ceiling type with one main & one satellite light units.
3 System Configuration	
3.1	Operating light ceiling type having dual dome with all standard accessories.
4 Technical Specifications	
I Main Light, 1 unit.	
4.1	Shall be a ceiling mounted light with flexible arm.
4.2	Number of light head: 1 no.
4.3	Light head shall not be greater than 760mm diameter.
4.4	Number of bulb: 1 main bulb, halogen 24V 150W or Better with 1 backup bulb with auto-switching or multi-bulbs light head not more than 4 bulbs of halogen 12V 50W.
4.5	Light intensity range, shall not be less than 100,000 lux at 1 meter distance from light source
4.6	Light temperature between 4000 - 4500K.
4.7	Colour rendering index in between 92 - 94.
4.8	Shall have 99% heat filtrating.
4.9	Temperature increase at head shall not be more than 2oC.
4.10	Temperature increase on operating field shall not be more than 15oC.
4.11	Radiant heat energy (beam temperature) shall not exceed 25,000 microwatts per square centimetre measured 1m from the light source.
4.12	The light offered shall have safety designed to prevent patient from burns, especially during the ophthalmic procedures. The light offered shall be certified safe to be used under ophthalmic procedures.
4.13	Working distance range (focal length): 70 - 180cm.
4.14	Depth of field with focused light: > 70cm.
4.15	Luminance field size: 15-25cm diameter, adjustable.
4.16	Shall have a control to regulate light intensity and to switch on the unit.
4.17	Shall have an On/Off switch at lamp head.
4.18	Shall come with continuous dimmer, continuous focus adjustment, continuous field adjustment.
4.19	Sterilizeable handle to regulate light field size, 3 pcs.
4.20	Vertical adjustment shall not be less than 115cm.
4.21	Rotation: 360°.
4.22	Shall come with Ophthalmic procedures safe light bulbs with a minimum of 1000 hours lifespan.
II Satellite Light, 1 unit.	
4.23	Shall be ceiling mounted together with the main light with flexible arm.
4.24	Number of light head: 1 no.
4.25	Light head shall not be greater than 500mm diameter.
4.26	Number of bulb: 1 main bulb, halogen 24V 150W or Better with 1 backup bulb with auto-switching or multi-bulbs light head not more than 3 bulbs of halogen 12V 50W.
4.27	Light intensity range, shall not be less than 80,000 lux at 1 meter distance from light source.
4.28	Light temperature between 4000 - 4500K.
4.29	Colour rendering index in between 92 - 94. Bidder shall attached certified test certificated showing the compliance of this requirement with TSF.
4.30	Shall have 99% heat filtrating.
4.31	Temperature increase at head shall not be more than 2o C.
4.32	Temperature increase on operating field shall not be more than 15oC.

4.33	Radiant heat energy (beam temperature) shall not exceed 25,000microwatts per square centimetre measured 1m from the light source.
4.34	The light offered shall have safety designed to prevent patient from burns, especially during the ophthalmic procedures. The light offered shall be certified safe to be used under ophthalmic procedures.
4.35	Working distance range (focal length): 70 - 180cm.
4.36	Depth of field with focused light: > 70cm.
4.37	Luminance field size: 15-25cm diameter, adjustable.
4.38	Must have a control to regulate light intensity and to switch on the unit.
4.39	Shall have an On/Off switch at lamp head.
4.40	Shall come with continuous dimmer, continuous focus adjustment, continuous field adjustment.
4.41	Sterilizeable handle to regulate light field size, 3 pcs.
4.42	Vertical adjustment shall not be less than 115cm.
4.43	Rotation: 360°.
4.44	Shall come with Ophthalmic procedures safe light bulbs with a minimum of 1000 hours
4.45	The main light and satellite light shall comply with interference suppressed VDE 0875 or equivalent.
4.46	Transformer and operating elements shall be integrated in housing of main light & satellite light.
4.47	Installation Kit
	The followings items shall also be included:
	☐ Ceiling mounting plate/ bracket or equivalent and works and materials to make good the ceiling after installation.
	☐ Wires, conduits and other accessories for connecting the wall control box, the light and others.
	☐ Other materials needed for the installation on the items above.
	5 Accessories, spares and consumables
5.1	Accessories:
	☐ Spare halogen bulbs for main light & satellite light: 01 set each.
	☐ 1 x spare set of fuses.
5.2	All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer. Bidders must specify the quantity of every item included in their offer (including items not specified above).
	6 Operating Environment
6.1	The system offered shall be designed to store and to operate normally under the conditions include Climate, Power supply , Temperature, Humidity, etc. for Sudan
6.2	Power supply: 220 – 240 VAC, 50Hz fitted with appropriate plug. The power cable must be at least 3 metre in length.
	7 Standards and Safety Requirements
7.1	Must submit ISO13485:2003/AC:2007 for Medical Devices AND
7.2	CE (93/42 EEC Directives) or USFDA approved product certificate.
7.3	Electrical safety conforms to standards for electrical safety IEC 60601-1 General requirement for Electrical safety of Medical Equipment.
	8 User Training
8.1	Must provide user training (including how to use and maintain the equipment).
	9 Warranty
9.1	Comprehensive warranty for 2 years after acceptance.
	10 Maintenance Service During Warranty Period
10.1	During the warranty period supplier must ensure corrective/breakdown maintenance whenever required.
	11 Installation and Commissioning
11.1	The bidder must arrange for the equipment to be installed and commissioned by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.
	12 Documentation
12.1	User (Operating) manual in English.
12.2	Service (Technical / Maintenance) manual in English.
12.3	List of important spare parts and accessories with their part numbers and costing.
12.4	Certificate of calibration and inspection from factory.

Mobile operating light

No.	Item Specifications
	1 Description of Function
1.1	Mobile operating light is required for carrying out operations in an emergency environment and the system can be moved from place to place in hospitals.
	2 Operational Requirements
2.1	Shall operate on mains electric supply as well as on battery.
	3 System Configuration
3.1	Operating Light Mobile with single light head, moveable on casters and with all standard accessories.

4	Technical Specifications
4.1	The light shall be designed with good counterbalance mechanism in order to ensure stability of light head in all positions
4.2	Shall have single light head.
4.3	Light head shall not be greater than 400mm diameter
4.4	Number of bulb: 1 main bulb halogen 24V 150W with 1 backup bulb with auto-switching or multi-bulbs light head not more than 3 bulbs of halogen 12V 50W.
4.5	Light intensity range, shall not be less than 80,000 lux at 1 meter distance from light source. Bidder shall attached certified test certificated showing the compliance of this requirement with TSF.
4.6	Light temperature, between 4000 - 4500 K.
4.7	Shall have colour rendering index in between 92 - 94.
4.8	Shall have 99% heat filtrating.
4.9	Temperature increase at head shall not be more than 2 oC.
4.1	Temperature increase on operating field shall not be more than 15 oC.
4.11	Radiant heat energy (beam temperature) shall not exceed 25,000 microwatts per square centimetre measured 1m from the light source.
4.12	The light offered shall have safety designed to prevent patient from burns, especially during the ophthalmic procedures. The light offered shall be certified safe to be used under ophthalmic procedures.
4.13	Working distance range (focal length): 70 - 130cm.
4.14	Depth of field with focused light: > 60cm.
4.15	Luminance field size: 15 ~ 25cm diameter, adjustable.
4.16	Shall have a control to regulate light intensity and to switch on the unit.
4.17	Shall have an On/Off switch at lamp head.
4.18	Shall come with continuous dimmer, continuous focus adjustment, continuous field adjustment.
4.19	Sterilizeable handle to regulate light field size, 2 pcs.
4.2	Vertical adjustment shall not be less than 115cm.
4.21	Rotation 360 degree.
4.22	Come with Ophthalmic procedures safe light bulbs with a minimum of 1000 hours lifespan.
4.23	Interference suppressed complies with VDE 0875 or equivalent.
4.24	Transformer and operating elements shall be integrated in light head housing.
4.25	Mobile Stand:
	Shall be based on light weight easily moveable stable support with at least 4 casters with locking counter balance mechanism in order to ensure stability of light head in all positions and with swivel arm. Caster must be medical chemical resistant.
4.26	Battery:
	☐ Lithium ion built in rechargeable batteries with capacity sufficient for operating in battery mode (fully charged) for minimum of 3 hours.
	☐ Shall include a built-in automatic battery charger with proper protection against battery damage.
	☐ Shall include battery power (charge) indicator.
5	Accessories, spares and consumables
5.1	Accessories:
	☐ 1 x spare halogen bulb.
	☐ 1 x spare set of fuses.
5.2	All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer.
6	Operating Environment
6.1	The product offered shall be designed to be stored and to operate normally under Power Supply, Climate, Temperature, Humidity, etc. for Sudan.
6.2	Power supply: 220 – 240 VAC, 50Hz fitted with appropriate plug. The power cable must be at least 3 metre in length.
7	Standards and Safety Requirements
7.1	Must submit ISO13485:2003/AC:2007 for Medical Devices AND
7.2	CE (93/42 EEC Directives) or USFDA or TUV approved product certificate.
7.3	Electrical safety conforms to standards for electrical safety IEC 60601-1 General requirement for Electrical safety of Medical Equipment.
8	User Training
8.1	Must provide user training (including how to use and maintain the equipment).
9	Warranty
9.1	Comprehensive warranty for 1 year after acceptance.
10	Maintenance Service During Warranty Period
10.1	During warranty period supplier must ensure corrective/breakdown maintenance whenever required.
11	Documentation
11.1	User (Operating) manual in English.
11.2	Service (Technical / Maintenance) manual in English.

11.3	List of important spare parts and accessories with their part numbers and costing.
11.4	Certificate of calibration and inspection from factory.

Diathermy

No.	Item Specifications
1	Description of Functions
1.1	A 300W diathermy machine (electrosurgical unit)
2	Operational Requirements
2.1	It shall operate on AC power supply in the operating theatre.
3	System Configurations
3.1	Diathermy Machine (Electrosurgical) 300W with complete accessories.
4	Technical Specifications
4.1	Nominal HF output: 300 Watts at ~400 Ohm.
4.2	At least 2 modes of operation: mono-polar cutting and mono-polar / bipolar coagulation.
4.3	Mono-polar cutting modes shall have different level of effects from pure cutting to blend cutting (cutting with haemostasis).
4.4	Come with 3 mono-polar coagulation modes - soft, forced and spray.
4.5	Desiccate mode for low voltage contact coagulation suitable in delicate tissue work
4.6	Fulgurate mode for efficient non-contact coagulation in most applications.
4.7	Spray mode for coagulation large tissue areas with minimum depth of necrosis.
4.8	Come with 3 bipolar modes: precise, standard and macro or equivalent.
4.9	Precise mode to have fine control of desiccation in delicate tissue.
4.1	Standard mode for applications at low voltage to prevent sparking.
4.11	Macro mode for applications on tissue with high resistance.
4.12	Control panel with digital setting and display of power of modes used.
4.13	All mono-polar and bipolar modes shall be controllable by hand switch and footswitch.
4.14	Bipolar mode can be activated by either foot pedal and / or auto coagulate by using forceps.
4.15	Footswitches shall be splash proof and unaffected by common OR fluid spills, easy to clean, have suitable mechanical protection against accidental pedal depression and Switches shall not be susceptible to sticking in the ON position.
4.16	Unit must have automatic power regulating feature to always keep minimum current to the patient throughout the procedures.
4.17	Shall come with Return Electrode Contact Quality Monitors (RECQMs) to monitor the quality of electrode-skin contact to eliminate the risk of patient's burn. It shall give audio-visual alarm and deactivate output if contact between patient and electrode is loosened or disconnected.
4.18	Come with output Leakage controller.
4.19	Shall have over current protection.
4.2	Shall be able to be activated from only one output at a time.
4.21	Must have an undefeatable audible activation-tone indicator/alarm.
4.22	The unit must have RF activation port to tell other equipment like ECG or EEG that RF current is being generated.
5	Accessories, Spare Parts and Consumables
5.1	All standard accessories/consumables/parts required for the proper operation of the above item shall be included in the offer. Bidders shall specify, in a separate Excel worksheet, the quantity and details of any items included in this offer which have not been specified in this Technical Specifications Forms.
5.2	All standard Maintenance tools and cleaning /lubrication materials where applicable shall be included.
5.3	The unit shall come with trolley well designed to fit the generator with drawers for keeping the accessories
5.4	One unit/ set of explosion-protected foot pedal for mono-polar and bipolar operation
5.5	Universal adapter to fit and use with most common electrosurgical instruments/ hand pieces x 1 set.
5.6	Come with reusable standard mono-polar pencil/ handle with 2 button switch - 1 unit.
5.7	Reusable mono-polar cord x 1 set.
5.8	Come with 2 types of reusable standard mono-polar electrodes, 1 piece/ type of electrode.
5.9	Come with 1 piece of reusable standard mono-polar coagulation forceps.
5.1	Come with 1 piece of reusable standard bipolar forceps with hand switch.
5.11	Reusable bipolar cord x 1 set.
5.12	Reusable connecting cable for patient electrode x 1 set
5.13	Patient return electrode for Adult & Child, 50 pieces each
6	Operating Environment
6.1	Power supply: 220 – 240 VAC, 50Hz fitted with appropriate plug. The power cable must be at least 3 metres in length.
7	Standards & Safety Requirements
7.1	Must submit ISO13485:2003/AC:2007 for Medical Devices AND
7.2	CE (93/42 EEC Directives) or USFDA or TUV approved product certificate.

7.3	Shall meet IEC 60601-2-2 Medical Electrical Equipment - PART 2-2: Particular Requirements for the Safety of HIGH FREQUENCY SURGICAL EQUIPMENT.
8	User Training:
8.1	The Supplier shall conduct user training for this equipment to enable operators to use the equipment properly. The training shall include the use of all operational functions of the equipment, as well as routine checks and maintenance expected by users.
9	Warranty
9.1	Comprehensive warranty for 2 years.
10	Maintenance Service During Warranty Period
10.1	Preventive and corrective maintenance services during warranty period shall be included.
11	Documentation
11.1	User (Operating) manual in English.
11.2	Service (Technical / Maintenance) manual in English.
11.3	List of important spare parts and accessories with their part numbers and costing.
11.4	Certificate of calibration and inspection from factory.

Delivery Bed

No.	Item Specifications
1	Description of Function
1.1	Delivery bed is used for Baby Delivery and must incorporate ideal blend of the patient's individual requirements on comfort and the professional needs of the delivery team, focusing on the aesthetic and functional design of the entire product.
2	Operational Requirements
2.1	Manually operated delivery bed.
3	System Configuration
3.1	Delivery Bed with complete attachments and accessories.
4	Technical Specifications
4.1	It must have manual adjustments for height and back positions.
4.2	It must have collapsible side rails.
4.3	It must have three sectional mattresses and seat section must have large perennial cut.
4.4	It must have head board which can be detached.
4.5	Must have wheels provided with locking system.
4.6	Must have retractable foot section so as to convert bed into table.
4.7	Must have infusion rods which have adjustable heights, quick release and attaches to all corners of bed.
4.8	Must have adjustable leg rests.
4.9	Must have push grip handles.
4.1	Must have sliding stainless steel bowl at perennial part of table.
4.11	It must have catheter bag holder which can be attached on either side of bed.
4.12	It must be able to give trendelenburg, reverse trendelenburg and 70 degree sitting position.
4.13	It must have adjustable foot supports.
4.14	It must be easy to maintain clean and sterilize (especially blood stains).
4.15	Frame must be (washable) stainless steel.
4.16	Dimensions (approx.):
	☐ Length: 7 feet
	☐ Width: 3 feet
5	Accessories, spares and consumables
5.1	All standard attachments and accessories: 01 set
5.2	All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer.
6	Operating Environment
6.1	The product offered shall be designed to be stored and to operate normally under Climate, Temperature , Humidity , etc. for Sudan.
7	Warranty
7.1	Comprehensive warranty for 2 years after acceptance.
8	Maintenance Service During Warranty Period
8.1	During the warranty period supplier must ensure corrective/breakdown maintenance whenever required.

Stress Test ECG

No.	Specifications
	Treadmill Stress Test System
	S.N. Purchaser's Specifications
	Treadmill Stress Test System

	Manufacturer
	Brand
	Type / Model
	Country of Origin
	1 Description of Function
	1.1 In this system the patient exercises on a treadmill according to a standardized protocol and the cardiac abnormalities can be studied under stress conditions which we may miss under resting.
	2 Operational Requirements
	2.1 The Treadmill Stress Test System must be complete with acquisition of resting and stress ECG, Treadmill Unit with interface with all the protocols and provision of printing the resting as well as Stress ECG and analysing the same.
	Must be able to be interfaced to Hospital Information System/ LAN/WLAN.
	3 System Configuration
	3.1 Treadmill Stress test System with interface cable and other complete accessories.
	4 Technical Specifications
	4.1 Must acquire and analyze 12/15 simultaneous ECG leads.
	4.2 Must have facility for display of all 12/15 leads real time Rhythm ECG on screen.
	4.3 Must have facility of on line storage of patient ECG data. Storage of at least 500 patients on HDD. In addition the storage on floppy drive or CD must be possible.
	4.4 Updated medians with elimination of artefact ectopy and aberrancy in all leads.
	4.5 Filters with facility to eliminate artefact due to respiration muscle/noise, AC interference, baseline wandering without compromising/distortion in ST segment changes.
	4.6 Must have facility to do the reanalysis of stored ECG report with reanalysis of the current stress report by changing the measurement point i.e. E, J and post J points.
	4.7 The monitor must display auto comparison of resting versus current lead of maximum ST depression separately with colour coded protocol, stage, clocks for elapsed time, total time, Target HR, Treadmill speed & grade, PVC counts/minute, warning messages & prompts, lead check torso.
	4.8 The system must have user defined report generation in different formats including the ST/HR loops and ST/HR index up to 15 leads formats for close diagnosis.
	4.9 Must have facility for 12 lead resting electrocardiogram with full interpretation.
	4.10 Must have provision of software driven, user programmable exercise protocols or standard protocols. Facility must be available for choice for both staged and ramp protocols.
	4.11 System must print comprehensive final report on a minute by minute record of ST segment changes ST segment trend plot and acceleration of ST segment.
	4.12 Display must have facility to amplify a normal gain along with a sample of resting ECG complex for close test.
	4.13 System must have dynamic scan facility to display automatically the worst ECG lead.
	4.14 Signal acquisition from patient and analysis must be performed at the patient itself to eliminate the environmental noise.
	4.15 Automatic arrhythmia detection and documentation.
	4.16 Facility for display of processed ECG vectors after signal averaging allowing view of artifact free ECG complexes.
	4.17 Must have beat to beat online storage and event review.
	4.18 System must be able to provide the real time printing by auto or manual mode in desired formats. Writer resolution must be thermal 1000 line/sec x 200 dpi for printing.
	4.19 System must be able to be integrated with HIS/LAN/WLAN.
	4.20 Must be able to transfer data through modem card (optional).
	4.21 The treadmill must:
	Must always start from 0 km/h
	2
	S.N. Purchaser's Specifications
	Must have load capacity of 200kg.
	Must have speed range of 0-13.5mph and
	Must have elevation 0-25%
	Must have facility to run the self-calibration programme.
	Must have minimum 150cm walking surface.
	Must be noise free
	Must be automatic programmable
	Must be FDA/CE/ISI approved/certified.
	Must have two stop modes with digital Microprocessor control, including one patient activated stop mode. The same must be interfaced to the main analysis system
	5 Accessories, spares and consumables
	5.1 Accessories:
	Must Patient cable -02 nos.

	☐ Interface cable- 1no.
	☐ Printer- 1 no.
	☐ Body wear – 1 no.
	☐ Paper - 1000 A4 Sheets
	5.2 All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer. Bidders must specify the quantity of every item included in their offer (including items not specified above).
	6 Operating Environment
	6.1 The system offered shall be designed to store and to operate normally under the conditions of the purchaser's country. The conditions include Power Supply, Climate, Temperature, Humidity, etc.
	6.2 Power supply: 220 – 240V AC, 50Hz fitted with appropriate plug. The power cable must be at least 3 metre in length.
	6.3 UPS of suitable rating conforming to international standards shall be supplied for minimum 30 min. backup for the entire system.
	7 Standards and Safety Requirements
	7.1 Must submit ISO13485:2003/AC:2007 for Medical Devices AND
	7.2 CE (93/ 42 EEC Directives) or USFDA approved product certificate.
	7.3 Shall meet IEC-60601-1-2:2001 General Requirements of Safety for Electromagnetic Compatibility.
	7.4 Electrical safety conforms to standards for electrical safety IEC-60601-1 General Requirements and IEC-60601-2-25 Safety of Electrocardiograms.
	8 User Training
	8.1 Must provide user training (including how to use and maintain the equipment).
	9 Warranty
	9.1 Comprehensive warranty for 2 years after acceptance.
	10 Maintenance Service during Warranty Period
	10.1 During the warranty period supplier must ensure planned preventive maintenance (PPM) along with corrective/breakdown maintenance whenever required.
	11 Installation and Commissioning
	11.1 The bidder must arrange for the equipment to be installed and commissioned by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.
	12 Documentation
	12.1 User (Operating) manual in English
	12.2 Service (Technical / Maintenance) manual in English
	12.3 List of important spare parts and accessories with their part numbers and costing.
	12.4 Certificate of calibration and inspection from factory.

Holter Monitor

No.	Specifications
	1 Description of Function
	1.1 It is used to evaluate the presence of “erratic heart beats” or arrhythmias in patients with or without symptoms. Also to evaluate the effect of medications, to evaluate pacemaker function. It is also used to assist in the detection of narrowed arteries in the heart, which may result in inadequate blood supply to the heart muscles.
	2 Operational Requirements
	2.1 Holter Monitor with three channel digital recorder with removable storage media such CF Card and battery as well as mains operation.
	3 System Configuration
	3.1 Holter Monitor complete with accessories
	4 Technical Specifications
	4.1 PC based software capable of working with latest windows configuration.
	4.2 3 Channel Arrhythmia analysis
	4.3 Full disclosure of ECG with different colour coding for VE, SVE & PAUSES
	4.4 Hourly count menu, Page scan, Mega scan
	4.5 Minimum of 20 Templates editing to analyse VE, SVE, V-RUN, SV-RUN, PAUSE, ST
	4.6 Atrial fibrillation/Flutter analysis
	4.7 Heart Rate Variability (HRV) (Time Domain, 3D frequency Domain, Lorenz Point care plot)
	4.8 SAECG – Late Potential analysis.
	4.9 Pace Maker auto detection and analysis
	4.10 Possible to have an unique 12 lead analysis with FCG CAD gram
	4.11 Sleep apnoea monitoring
	4.12 12-Lead ST scan

	4.13 QT analysis with validation
	4.14 Vectorcardiography
	4.15 To print ECG strips from any part of Holter recording
	4.16 Same software capable of analysing data from 3 Channel digital recorders
	4.17 Possible for Electronic enrolment for CF flash Card.
	4.18 TWA alternans analysis
	4.19 Colour Printing
	4.20 Recorder must be compatible with inbuilt rechargeable alkaline batteries to support at least 90 minutes battery backup.
	Bidder shall specify the number of batteries being provided.
	4.21 Digital recorder must have a minimum of 512 samples/sec/channel for pacemaker spike detection and at least 128 samples/sec/channel for recording and storage of 1000/sec/channel for VLP.
	5 Accessories, spares and consumables
	5.1 Accessories:
	☐ Minimum 64 MB CF card - 01 no.
	☐ 7-Lead cable - 01 no.
	☐ PC of latest configuration with 19" flat monitor-01 no.
	☐ Colour laser printer- 01 no.
	☐ Inbuilt rechargeable alkaline batteries
	5.2 All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer. Bidders must specify the quantity of every item included in their offer (including items not specified above).
	S.N. Purchaser's Specifications
	6 Operating Environment
	6.1 The system offered shall be designed to operate normally under the conditions of the purchaser's country. The conditions include Power Supply, Climate, Temperature, Humidity, etc.
	6.2 Power supply: 220 – 240 VAC, 50Hz fitted with appropriate plug. The power cable must be at least 3 metre in length.
	7 Standards and Safety Requirements
	7.1 Must be USFDA, CE (93/42 EEC Directives), UL or TUV approved product.
	7.2 This unit shall be certified to meet ISO9001 and/or ISO14971 and/or ISO 13485:2003/AC: 2007.
	7.3 Shall meet IEC-60601-1-2:2001 General Requirements of Safety for Electromagnetic Compatibility or must comply with 89/366/EEC; EMC directive
	7.4 Electrical safety conforms to standards for electrical safety IEC 60601-1 (General requirement for Electrical safety of Medical Equipment).
	8 User Training
	8.1 Must provide user training (including how to use and maintain the equipment).
	9 Warranty
	9.1 Comprehensive warranty for 2 years from acceptance.
	10 Maintenance Service During Warranty Period
	10.1 During the warranty period supplier must ensure corrective/breakdown maintenance whenever required.
	11 Installation and Commissioning
	11.1 The bidder must arrange for the equipment to be installed and commissioned by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.
	12 Documentation
	12.1 User (Operating) manual in English
	12.2 Service (Technical / Maintenance) manual in English
	12.3 List of important spare parts and accessories with their part number and costing.
	12.4 Certificate of calibration and inspection from factory.

BIPAP (Bi-level Positive Airway Pressure)

No.	Specifications
	1 Description of Function
	1.1 BIPAP stands for Bi-level Positive Airway Pressure. It is a breathing apparatus that helps people get more air into their lungs.
	2 Operational Requirements
	2.1 Integrated display screen shall display easy-to-read real time graphics in waveform or bar scale format the measured and calculated parameters.
	3 System Configuration
	3.1 BIPAP (Bi-level Positive Airway Pressure), complete unit with all standard accessories.

	4 Technical Specifications
	4.1 Machine shall be based on the solenoid valve technology and shall offer preferably auto track sensitivity and adjustable rise time.
	4.2 IPAP: approx. 4 to 30cmH2O.
	4.3 EPAP: approx. 4 to 25cmH2O.
	4.4 Breath rate: approx.0 to 30BPM with spontaneous for time mode.
	4.5 Timed inspiration: approx. 0.5 to 3.0s.
	4.6 Rise time: approx. 100 to 600ms.
	4.7 Shall have facility for upgrades.
	5 Accessories, spares and consumables
	5.1 All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer. Bidders must specify the quantity of every item included in their offer (including items not specified above).
	6 Operating Environment
	6.1 The product offered shall be designed to be stored and to operate normally under the conditions of the purchaser's country. The conditions include Power Supply, Climate, Temperature, Humidity, etc.
	6.2 Power supply: 220 – 240 VAC, 50Hz fitted with appropriate plug. The power cable must be at least 3 metre in length.
	7 Standards and Safety Requirements
	7.1 Must submit ISO13485:2003/AC:2007 for Medical Devices AND
	7.2 CE (93/42 EEC Directives) or USFDA approved product certificate.
	7.3 Electrical safety conforms to standards for electrical safety IEC 60601-1 General requirement for Electrical safety of Medical Equipment.
	8 User Training
	8.1 Must provide user training (including how to use and maintain the equipment).
	9 Warranty
	9.1 Comprehensive warranty for 2 years after acceptance.
	10 Maintenance Service During Warranty Period
	10.1 During warranty period supplier must ensure corrective/breakdown maintenance whenever required.
	11 Installation and Commissioning
	11.1 Supplier must accomplish proper commissioning of equipment onsite.
	12 Documentation
	12.1 User (Operating) manual in English.
	12.2 Service (Technical / Maintenance) manual in English.
	12.3 List of important spare parts and accessories with their part numbers and costing.
	12.4 Certificate of calibration and inspection from factory.

Spirometer

No.	Specifications
	A bench top lung function spirometry to measure FVC, SVC, MMV, MV, unit to be battery operated with auto interpretation and to feature:
	Built-in printer
	Large screen.
	RS-232 interface
	Large memory
	Reusable sensors.