

BIPHASIC DEFIBRILLATOR WITHOUT PACING:

Display 6.5" inch or more color LCD TFT

- Defibrillator with color monitor and recorder mains 220V/50Hz 1 phase.
- Built in rechargeable battery for minimum 100 shocks at maximum energy.
- Energy delivered 2-270 joules or more.
- Quick ECG waveform recovery after defibrillation, the ECG waveform recovers within 3 seconds.
- Defibrillator should have discharge button on both main unit and the paddle.
- Charging time should be less than 5 seconds for 270 joules.
- Self-test should be available to ensure reliable use of the defibrillator, whenever the power is turned on or off or the power cord is connected or disconnected. The self-test checks the battery expiration date and remaining voltage, and the High-Voltage circuit.
- Self-test result should be saved in internal memory for later review.
- Bi-Phasic waveform delivery system, ECG through paddles and patient cable,
- Trace Speed 25 mm/sec.
- Contact Indicator to check for optimal skin contact via LED'S on paddles, delivered energy level to be printed on the print out.
- Recorder speed 25mm/sec with standard paper, digital HR with low/high alarm and Adult & Paediatric Paddles.
- Voice recording Surrounding sound, synchronized with the ECG waveform, and should be recorded.
- AED Cable with pad.
- Should have upgradable capability to measure SPO2, NIBP & CO2 (Main Stream) for intubated patient & non-intubated patients.

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- Voice recording Surrounding sound, synchronized with the ECG waveform, and should be recorded.
- AED Cable with pad.
- Non invasive pacing.
- Should have upgradable capability to measure SPO₂, NIBP & CO₂ (Main Stream) for intubated patient & non-intubated patients.

• Adhesive hand free
Defibs + Pacing cables.

M. W. / m.w. / kly
Cali.

SYRINGE PUMP

MAIN FEATURE:

- Syringe Pump Should Have Controlled Rates

USER FRIENDLY:-

- Light in weight
- Compact size
- Automatic recognition of syringe size
- Automatic calculation of the infusion rate: based on volume and time pre-selection,
- Bottom loading syringe technique
- Large illuminating display
- Online changing of delivery rate possible
- Variable occlusion pressure limits
- Data lock function
- Standby function

DELIVERY RATE FROM:

- 1 ml/hr to 100.0 ml/hr or 0.01 ml/hr to 200 ml/hr.

BOLUS DELIVERY RATE:

- 01.00ml/hr to 1200.00ml/hr (with different sizes of syringe)
- Compatible to all types of syringes commonly used and available in pakistani market
- Sizes of syringes:-
- 2/3, 5, 10, 20, 30, 50 & 60 ml of any brand can be used.

RATING / CAPACITY OF EQUIP:-

- 1 MI/Hr To 100 MI/Hr

PUMP TYPE:-

Portable, The Handy Syringe Pump, Easy To Move For Mobile Operation

OTHERS DETAIL:-

Rechargeable battery type nicd,

Battery operating time: min. 5 hours during delivery rate < 10 ml/hr

Microprocessor controlled syringe pump

M. Usman
hmr

PROPOSED SPECIFICATION FOR THE PURCHASE OF FLAT PANEL

DIGITAL ANGIOGRAPHY SYSTEM IN AMTI ABBOTTABAD :

Flat Panel single plane fully digital Cardio-Vascular Angiography system (Latest Version).

Coverage from Head to Toes. The bear Minimum Technical specification of Angiography system is as follows.

POSITIONING ARM:

STAND:

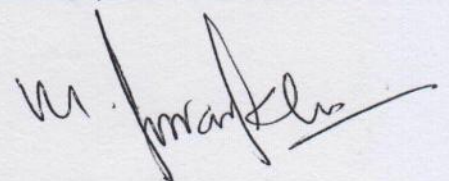
- Ceiling/floor mounted stand with manual and motorized movements, providing free access to patient table from all 3x sides
- Real time display of rotation angulations.
- Geometry: C-arm
- C arm depth of 85cm or more
- RAO / LAO +/- 120 ° or more
- C-arm permits 45° cranial and 45° caudal angulations of the imaging system or Above
- 3D Rotational angiography with a speed of upto 50°/sec or more.
- Isocentric Height: Variable / Fixed. Variable / Fixed. Focus spot to iso-center should be 75 cm or more
- Auto Positioning: Programmable auto positioning of selected angulations. Ability to recall stand position by reference image should be possible.
- The control panel can be mounted at any side of the patient table.
- All the rotational / angles should be available and digitally displayed in the control and examination room.
- Motorized & manual parking of the positioning arm should be possible

DIGITAL FLAT PANEL:

- Image matrix of **1.3 x 1.3 x 14 bit**; or more. Systems with higher matrix will be preferred
- 30x30cm/ **26X29cm** Approx. sized detector with five formats or more
- Built in temperature stabilizer
- Digital flat panel detector with pixel pitch of 194 micron or better and DQE of 70% at 0 lp/mm or more
- All other standard accessories according to this digital flat panel.
- Removable Ant scatter grid for lowering dose to infants & Peads

PATIENT SUPPORT/ TABLE:

- Interventional Table:
- Floor mounted with up down / vertical, longitudinal table top length of minimum **280 cm** or more
- Longitudinal travel.: 110 cm or more
- Lateral Travel + - **17 cm or more**
- CPR: with tabletop In any table longitudinal position, without the need of retraction
- Table top should be of such construction in material and durability to accept patients weight of not less than 220 kg or more
- Table top should have metal free over hang for un-obstructed imaging coverage & having integrated hemodynamic monitoring system controls
- Complete accessories should be provided including arm holder, hand grip, arm support and arm rest and positioning aids.
- Pivot +/- 90Deg or better



X-RAY GENERATOR:

- Microprocessor based high frequency using fiber optic for data communication between each imaging system.
- Dedicated X-Ray generator of 100 kW.
- Radiographic rating minimum 1000 mA at 100KV
- Serial filming exposures, Auto exposure optimization with shortest exposure of 1ms, with automatic kV and mA control for optimum image quality.
- The system should have capability of digital radiography and fluoroscopy.
- Should have capability of doing digital pulsed fluoroscopy at 3.75/7.5/ 15 / 30 pulses per second. Automatic kV, mA & pulse width regulation facility.

DIGITAL IMAGING AND ACQUISITION / FLUOROSCOPY.

DIGITAL SYSTEM:

- Pulse Fluoroscopy at 30/25 FPS, 15/12.5 FPS, 7.5/6 FPS or better in 1024 x 1024 x 16 bits
- Parallel processing capability / multitasking facility.
- Real time filtering and road map function.
- Cine Acquisition at 3.75, 7.5, 15 and 30 pulses per seconds
- Storage capacity 50,000 images or more in 1024x1024x12 bits matrix
- Integrated dose monitoring and dose structured reporting in Dicom.
- System should be capable to display and store images in 512 x 512 acquisitions at **30fps for pediatric**

X-RAY TUBE with GRID SWITCH Technology

- Dual focal with at least **03 MHU** or better anode heat storage capacity with anode heat dissipation rate of **2900 W** or more to enable continuous heat dissipation during serial exposure.
- Dual focus, rotating anode. Focal spot sizes 0.4 - 0.8 mm or better:
- Dose management with fluoro Cu filters. : Copper filters: 0.2, 0.5, and 0.9 mm CU equivalent

MONITORS:

- Flat Screen 19" or more TFT of 1024 x 1024 matrix
- Monitors should be ceiling mounted in the operation room.
- One 56" or better 8MP medical grade monitor with integrated tableside control in touch panel
- All the monitors will be of Medical Grade, complied with international standards for medical monitors.

CONTROLS:

- All controls of digital imaging system, incl. Post Processing & Quantification analysis shall be in the control room while replay / display of reference image should be available in the examination room. Wired/Wireless remote control for playback and processing functions. Table side control through touch panel at the table side should be available.
- Table side controls are essential. Controls should be manageable from both sides of the table.

RECORDING / ARCHIVING & COMMUNICATION SYSTEM:

- Recording / archiving system should be DICOM-3 compatible.
- DICOM (send/storage, commitment, retrieve/query)
- Ethernet connection to connect with other terminals.
- Intercom system.

W. J. ...

Workstation: OEM Only

- Dedicated cardiovascular Workstation quoted should be from the original manufacturer of the cath lab with integrated tableside controls for reviewing prior data
- DICOM-3 Compatible.
- Edge enhancement, adjustable view speeds & post processing, QCA & LVA Quantifications on Workstation should be offered as standard
- High resolution 19" TFT Monitor or more
- CD/DVD writer and CD/DVD ROM drive.

SOFTWARE / HARDWARE PACKAGES:

- Advance roadmap imaging capability based on superimposition of live fluoro imaging on Angio imaging
- Automatic loop replay after acquisition or fluoroscopy.
- Dynamic real time pan / zoom.
- DSA
- Standard Quantification packages vascular quantitative analysis including vessel analysis, vessel size and stenosis assessment.
- Online image density (gray scale) correction.
- System should be able to perform single axis rotation from all 3x sides i-e head end and both sides of the patient end
- All controls of digital imaging system incl. Post-processing & Quantification shall be in the examination as well as control room.
- All the advance clinical packages offered by the vendor should be from the OEM of the Angio system
- Stent Visualization with enhanced stent in relation of the vessel lumen. **Real Time stent enhancement for facilitation of cardiac procedure.** The feature should be controllable from the tableside touch panel of the angio table. All the quoted advance clinical applications should be offered with OEM catalogue no

RADIATION PROTECTION:

- Ceiling suspended tilt able lead glass for radiation protection of operators head / neck regions.
- Collision tolerant.
- Lower body radiation protection flaps.
- **Zero Dose Positioning/Similar**

PHYSIOLOGICAL HEAMODYNAMIC MONITORING SYSTEM : OEM Only

- Should be from the original manufacturer of the Angio system & have integrated table side controls in the touch panel of the table (including control for Auto record capability, capture & storage of hemodynamic waveforms and ECG's, control of Cardiac Output measurements, NIBP measurement etc.,
- Multichannel (16 channels or more) to record at least 2 channels IBP, Cardiac out put with thermo dilution method, Surface ECG in any configuration and simultaneous 12 lead ECG, NIBP and SpO2 measurement.
- Digital display of all the parameters like IBP, Heart rate, cardiac out put parameter.
- It should be possible to store the waveforms on the hard disk of the physiological recording system.

W. M. K.

- *The hemodynamic monitoring system should include following accessories :*
- Pulse oximeter probes 2x
- 2x invasive blood pressure reusable transducer.
- Reusable interface for 12 lead ECG (2 Nos)
- NIBP cuffs (02 Nos)
- Holder for mounting the IBP transducer alongside the patient table.

ACCESSORIES:

- 160 KVA UPS for Angio System
- Lead aprons 10x
- Compatible Injector
- Syringes 100.

WARRANTY:

- 3 Years Comprehensive warranty with Parts and 02 Years without parts from the Manufacturer.
- 10 year part availability of the quoted model.

FIRM RESPONSIBILITY:

All firms should quote all their latest applications/solutions for dose reduction (Like CARE, CLARITY , SNRF)

Renovation of site along with Electrical work complete in all respect, Civil Work complete in all respect , Lead lining, Scrubbing Facilities will be the responsibility of the vendor .

M. Manjula

INFUSION PUMP

INFUSION PUMP PURPOSE: Infusion Pump Used For Continuous Controlled Administration Of I.V Drugs.

MAIN FEATURE: Infusion Pump Should Be One With Of Infusion Rate,

DELIVERY RATE **0.1 ML/HR TO 999.9 ML/HR** SMALLEST INCREMENT OF 0.1 ML/HR

User friendly

Air in line detector minimizes risk of air infusion

Compatible with all commonly used medical grade i.v administration sets

DELIVERY RATE / CAPACITY: rate 0.1 ml/hr to 999.9 ml/hr

Universal drop sensor

HOLDING STAND: Universal Type Pole Clamp Rotable

BATTERY BACKUP TIME: up to 3.0. hr at max delivery rate

BATTERY TYPE: Nicd (Rechargeable)

GROUND SUPPORT EQUIPMENT: Vertical Stand Mobile Type.

VOLUME SELECTION: 0.1...9999.9 ML /

TIME SELECTION: MAX. 99 H 59 MIN

Automatic Calculation Of Delivery Rate - From Volume And Time

PURGE PARAMETERS:

Bolus volume 0.1 to 99.9

bolus rate 1 to 999.9 ml/hr.

THREE METHOD FOR GIVING BOLUS:-

- a. Bolus with volume pre-selection.
- b. Bolus without volume pre-selection.
- c. Interval bolus.

DOSAGE CALCULATION.

The Dosage Calculation Automatically Calculates The Delivery Rate In ML/H By Putting The Parameter Like Concentration, Weight Of Patient (Optional) And Entry Of Dosage

LOUDNESS CONTROL OF ALARM TONE.

The loudness of the audible alarm can be adjustable through keypad.

STANDBY INFUSION PAUSE: max 99 h 59 min., pre-set values remain store

DRUG SELECTION: Display 6 Or More Drugs With Names

Deactivation of drop control - in conjunction with volume pre-selection

Data lock: in this function locks the keypad against unwanted alteration of the parameter entered.

Variable occlusion pressure (low & high)

Large illuminated LCD display

M. S. S.

M. S. S.

ICU MOTORIZED BED

4 MOTORIZED ELECTRIC BED,

Should have 7 positions (Back Raise, Knee Raise, Hi-Low Adjustment, Auto Contour, Trendelenburg, Reverse Trendelenburg and Cardiac Chair Position) with X-ray radiolucent backrest with X-ray radiolucent backrest.

Movements:

- Smart Raise Function for Back Raise (Reduce back Pressure—can reduce patient pressure and shearing on the patient with its retraction and extension motion)
- Back Raise 0-70 degree.
- Knee raise 0-25 degree
- Hi-low adjustment from 350mm to 680mm (Mattress base)
- Trendelenburg/Reverse Trendelenburg position 0 \pm 12,
(Can be used while bed is in any position by pressing one button)
- Auto contour Position
- One button cardiac chair position

Controls:

Should have Patient and Nurse Control to perform the various bed positions.

- **Patient controller,**
(Auto contour, Back raise, Knee Raise and hi- low adjustment) with locking function).
- Separate Nurse control panel (can be stored under foot board) will control and indications for Start Button, Electric CPR, Battery Indicator, Low Height Indicator, Lock Function for Fixable Patient Controller, Auto Contour Position, Back Raise, Knee Raise, Hi-Lo Adjustment, Cardiac Chair Position and Trendelenburg/Reverse Trendelenburg.

CPR Function:

- **Should have both electric CPR function and Manual CPR function.**

Side Rails:

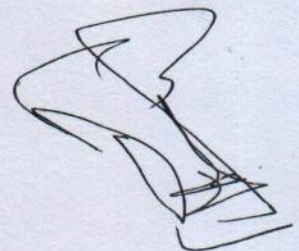
- Should have Full Length side rail meeting safety standard of IEC 60601-2-52. (To reduce the risk of patient fall down from Bed)
- Should Have Anti-tampering Lock feature (Prevents patient from falling over when patient is attempting to lower the side rail by himself)
- Should have Flexi Grip (grip on siderail to help patient to stand up more easier)
- Should have 290 mm effective side rail height with zero sliding gap.
- Should be slide down with Gas Spring shock absorber instead of out wards open type for safety.

Battery:

- Should have Battery with low battery indicator.

Mattress base.

- Made of steel
- Steel pressed mattress base.
- Seamless smooth surface for easy and quick cleaning.
- Hinge parts should be made of steel



CARDIAC MONITOR (UPGRADABLE):

For monitoring of patients Vital Signs for Adult, Paeds. & Neonates.

Operating Features and Characteristics:

Non fade TFT color display

Electro-surgical interference suppression/protection

Defibrillator protection

Freeze and cascade facility

Waveform trace speed: 25 to 50 mm/sec

Screen Size: min. 12" or more TFT/LCD color Touch Screen display

PARAMETERS:

- **ECG:**

Numeric: heart rate

Waveform: 10 Wave forms minimum, real time and freeze ECG trace.

12 Lead ECG Analysis should be available with 10 Lead ECG Electrodes.

- **Non-Invasive Blood Pressure (NIBP):**

Method: Oscillometric principle

Numeric: Systolic, diastolic and mean pressures

Selectable auto inflate interval settings

Rising cuff / continuous pressure display

- **Temperature:**

Numeric: Temperature selectable in °C / °F

Channels: 2 channels & ΔT.

- **Pulse Oximetry:**

Numeric: 0-100% oxygen saturation measuring range.

Waveform: plethysmograph pulse with pulse strength indication.

Motion Tolerance Technology.

Spo2 Technology should be from the original/same manufacturer.

- **Arrhythmia Analysis:**

Arrhythmia analysis and ST analysis.

Minimum 20 or more arrhythmia items.

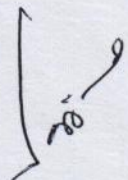
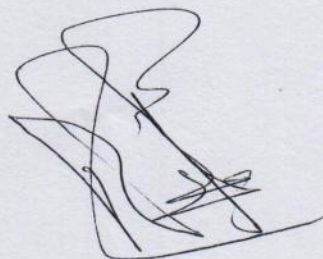
- **Respiration:**

Breathe rate display and alarms.

Sweep speed; 12.5 to 50 mm/sec.

- **Other Features:**

Trend Data; 72 hours trend graphical and tabular.



- **Alarm:**

High & low (settable) on all parameters

Visual and audible indication of alarms.

Apnea time 5-40s.

- **Operating Requirements:**

Ac 220v/50hz

Built-in rechargeable battery for at least 1-2 hours AC power failure at full parameter.

- **OPTIONAL:**

- Built-in Three Channel Recorder:

- IBP.

- ETCO₂ MAIN STREAM FOR INTUBATED AND NON INTUBATED PATIENTS:

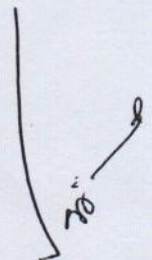
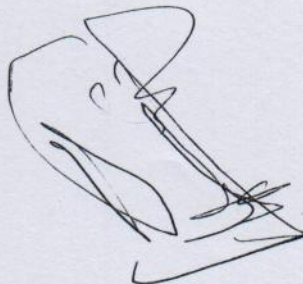
AIRWAY ADAPTER (30 PCS)

NASAL ADAPTER (30 PCS)

ETCO₂ technology should be from the original/same manufacturer.

OFFERED MONITORS SHOULD HAVE UPGRADEABLE CAPABILITY TO MEASURE ETCO₂, DUAL IBP, 2ND SPO₂, BIS, MULTIGAS UNIT, EEG (UPTO 8 CHANNEL) ETC.

All allied accessories should be from original/same manufacturer.



CENTRAL STATION FOR 16 BEDS & UP GRADABLE TO 32 BEDS:

Multi-channel 24-inches or more colored LCD Touch Screen.

Recording facility on Laser Printer.

HR with high and low alarms on all parameters selected on bedside monitors.

Operating Features and Characteristics:

- Waveform display method: Non Fade, Fixed Trace.
- Sweep speed: 50, 25, 6.25 mm/s.
- Waveform Display items: ECG, IBP, Respiration Wave, Pulse (SPO2), EEG, Flow/Paw, CO2, External input, anesthetic gas.
- Capability to store 120-hours trend data.
- Trend display format: Trend graph and Tabular data 120 hours.
- Capability to store 120-hour full disclosure ECG as well as 16 other waveforms for each patient.

- Built-in automatic Arrhythmia analysis and ST analysis.
- Full Disclosure 120 hours.
- Embedded Central Station Software.

OPTIONAL:

- EXPANSION KIT FOR 16 PATIENTS.
- EXPANSION KIT FOR 24 PATIENTS.
- EXPANSION KIT FOR 32 PATIENTS.

CENTRAL PROCESSING UNIT SHOULD BE FROM THE SAME MANUFACTURER (LOCAL PC NOT ACCEPTABLE).



MULTIPURPOSE HYDRAULIC OPERATION TABLE WITH INTEGRATED KIDNEY ELEVATOR

Technical Specifications

- Table Top (Radiolucent) with antistatic mattress 4 sections and equipped with Integrated X-ray cassette tunnel.
- Antistatic SAF pads, 60mm or more thick
- Side rail of stainless steel for attaching accessories 25 x 10 mm or more
- Mobile on castor 125mm or more
- Mobile base in shock resistant ABS/ sus 304, disinfectant-proof or better
- Minimum gap between padding to avoid crushing and sealed surface to clean it easily.
- Safe working load: 185 Kg or more
- Max. Static Load weight capacity: Up to 250kg or more

TABLE TOP IS ARRANGED AS:

- Head plate
- Back plate Servo -assisted adjustment
- Seat plate
- Two separate leg plates.
- Base of the table shock resistant ABS

MOVEMENT:

- Height Adjustment 700-1050mm or better
- Base (Length x Width) 1060mmx500mm or better
- Overall length with head and leg section 2000mm or better
- Kidney /Body elevator
- Trendelenburg/Reverse Trendelenburg 30/30 Degree or better
- Lateral tilt +/-20 Degree or better
- Back plate: 75/-50 or better
- Head rest 30/-45 degree or better
- Tilt of Head section pad 25 Degree or better
- Manual Leg plate movement : up 20/down 90 Degree or better
- Swiveling of leg plate: 55 degree or better

Accessories:

- Arm rest with clamp
- Anesthesia screen
- Large width body strap
- IV Pole
- Shoulder Support (pair)

Optional

- Accessories for General Orthopedic Surgeries
- Accessories for General Surgeries
- Accessories for Neuro
- Accessories for Urology
- Accessories for Thoracic Surgery.

Rate of each Accessory must be Quoted and its mandatory for every Vendor.

Forjani

asad

**SPECIFICATIONS OF LED OT CEILING LIGHT DOUBLE DOME WITH
SAME DIMENSIONS**

Sr.No	Specifications	
1.	Color Rendering Index Ra	95 or better
2.	Red rendering index R9	95 or better
3.	Total irradiance at 160,000 lux	550 w/m ² or better
4.	Central IL luminance, electrically dimmable	20-100%
5.	Central IL luminance at a distance of 1 m	160,000 Lux
6.	Satellite combination at 1 meter	160,000 Lux
7.	Life of Light source	50,000 hours or better
8.	Color temperature	3800K/ 4300K /4800k or more
9.	Built in Battery Backup	Up to 4 hrs or more

Amir

Amir

Autoclave

- Fully automatic, programmable, PLC controlled with 07" or more touch screen panel.
- Capacity: 06 STU or more
- Chamber, jacket and door made off AISI 316L stainless steel.
- Automatic pneumatic/ motorized vertical sliding door.
- Single Door unit.
- Chamber pressure monitoring.
- 2 stage Liquid ring vacuum pump.
- Media Monitoring for AIR and RO.
- Emergency switch is on the front of the system.
- All pipes and valves made off high quality stainless steel.
- Hot pipes should be thermally insulated.
- Self-diagnostic program.
- Built in printer.
- 4 basic standard cycles for items.
- 2 basic test cycles.
- RS-232 Connection port for network communication.
- PT-100 temperature sensor.
- Minimum 90 customized cycle that is according to the customer requirements.
- Built in energy saving system.
- Built in water saving system.
- Built in electrical steam generator.
- Built in air compressor
- Pressure gauges for chamber, jacket, and steam generator.
- Temperature and pressure sensor.
- Rectangular chamber.
- System should be complete with all accessories, Racks, Shelves, loading/unloading trolley.
- Reverse Osmosis system according to the capacity of the Unit .
- Loading and unloading trolley: 01
- Loading structure/ platform: 01
- Loading basket: 08

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DIATHERMY UNIT.

- Microprocessor Control Sinus Waveform.
- Digital Display of All Set Parameters
- 400KHZ or more Emitted Frequency and 20KHZ or more Modulation Frequency.
- 3 High Frequency outputs: 1 monopolar, 1 bipolar and 1 vessel sealing
- Microprocessor based solid state electrosurgical unit for normal and under water cutting.
- Permanent safe sealing of vessel on tissue bundle:
- RF power for monopolar cutting not below 300 watts.
- Monopolar coagulation 100 Watt or better.
- At least 3-4- blend/effect modes
- Bipolar coagulation
- Bipolar cutting
- Spray coagulation

Monopolar Cutting Power: -

AutoCut:	350W or more
PutCut:	350W or more
Blend 1:	350W or more
Blend 2:	350W or more
Endo Section:	350W or more
Forced Cut:	350W or more
Forced Pure Cut:	Forced Cut with Light Haemostatic Effect
Blend 1:	Forced Cut with Deep Haemostatic Effect
Blend:2	Forced Cut with Maximum Haemostatic Effect
Monopolar Cut under irrigation:	350W or more (Monopolar Forced Blend)

Monopolar Coagulation Power: -

Soft Coagulation:	150W or more
Desiccation	200
Fulguration/Spray:	100W or more

Bipolar Cut & Coagulation

PutCut:	200W or more
Blend 1:	200W or more
Blend 2:	200W or more
Endo Section:	200W or more
Bipolar Cut under Saline:	250W (Endo Section)

Bipolar Cut & Coagulation

Forced Coagulation:	100W or more
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Accessories

- 3 x Monopolar Foot Switch
- 1 x Bipolar Foot Switch
- 2 x Bipolar Forcep with Cable
- 5 x Monopolar Cables
- 8 x Different Cutting Electrodes
- 2 x Rubber Neutral Electrode with Cable

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ICU VENTILATOR TECHNICAL SPECIFICATIONS

Patient range:

Bias flow:

Internal compressible factor:

Gas delivery system:

Maximum airway pressure

Method of triggering:

Inspiratory flow range:

Pressure drop:

PEEP regulation:

Rise time, expiratory flow measurement:

Expiratory flow range:

12 inch TFT-LCD touch screen

Two battery module slots. One battery is delivered with the ventilator and Rechargeable, 14.4 V, 6.6 Ah each.

Airway pressure (upper alarm limit):

Adult= 16 - 100 cmH₂O

Pediatric= 16 - 90 cmH₂O

Respiratory rate (upper and lower alarm limits):

1 - 160 breaths/min Adult and Infant both

Pressure level above PEEP in backup (cmH₂O):

Adult= 5 - 99

Infant= 5 - 80

Flow rate = >0.2 (average: -0.4) ml/min

Residual volume = <0.1 ml for 3 ml dose

O₂ boost level = off, 1-79 %

O₂ boost function: = Activate O₂ boost up to 1 minute.

Ventilation Mode: Invasive and non-Invasive

PC, VC, PRVC, PS/CPAP, VSSIMV (VC), APRV.

NIV PC option and NIV PS option.

Disconnection flow: 7.5 l/min - 40 l/min

Tidal volume

- Pediatric: 20 - 350 ml
- Adult: 100 - 2000 ml

2 l/min ±5 %

Max. 0.1 ml/cmH₂O

Air turbine/ Compressor and O₂ valve

100 cmH₂O

Flow and pressure

- Adult: 0 - 240 l/min
- Pediatric: 0 - 80 l/min
- Max. 3 cmH₂O at a flow of 60 l/s (exp. channel)

Microprocessor controlled valve

<12 ms for 10 - 90 % response at flow of 3 - 192 l/min

0 - 192 l/min



Dr. Munawar Ali Awan
Assistant Professor
Consultant Intensivist, IIC MICU
ATH-MTI Abbottabad

TECHNICAL SPECIFICATION CRRT MACHINE:-

CRRT MACHINE FOR HEMODIALYSIS, CVVH & PLASMA THERAPIES

Electrical Operating 240 VAC, 50Hz, with Electrical Safety EN 60601-1 Light, Weight & Mobile

Machine should be able to maximum number of CRRT, DIALYSIS and PLASMA Therapies with combination of **Continuous, Intermittent and high flow therapies with single weighing scale and Plate Fluid Warmer for even temperature distribution:**

Continuous Therapies:

- 1. SCUF** - Slow Continuous Ultra-Filtration
- 2. CVVH** - Continuous Venous-Venous Hemofiltration
- 3. CVVHD** - Continuous Venous-Venous Hemo-dialysis
- 4. CVVHFD** - Continuous Venous-Venous High Flux Dialysis

Intermittent Therapies:

- 5. HF** - Hemofiltration
- 6. HD** - Hemodialysis
- 7. HFD** - High Flux Dialysis

Plasma Therapies:

- PEX** - Plasma Exchange
PAP - Plasma Absorption & Separation

The CRRT Machine should operate on multi scale principals for less alarms and operator's convenience and patient's comforts with Plate Type Warmer for evenly temperature distribution for warming fluids/Dialysate. The CRRT machine should have at least maximum number of pressure monitoring ports including Arterial, Venous, Pre Filter, Filter inlet and Filter outlet.

The CRRT Machine should have high flow capacities of Blood flow 10-500 ml/minute, Dialysate Flow up to 400 ml/minute, Substitute Solution Flow Rate of up to 250 ml/minute, Filtrate Flow Up to 300 ml/minute and Ultra-filtration Rate 0 to 2 Kg/hour.

The tubing circuit priming should be fully automatic with possibility of change of parameters and type of procedure during therapies with a CRRT Kit guaranteed life of 60 hour or more. The Therapies Filters should come separately and should provide open choice of selecting filters.


The Temperature Warmer Range should be 20-38 Degree Celsius or more and The CRRT Machine Single Load Cell should have capacity of 0-25 Kg or more,

Should give early message for BAG change and other Alarms in with three level of alarms of Prepare, Caution and Warning.

The CRRT Machine should have interface for infusion pump and able to display the Continuous and bolus infusion graphically.

The CRRT machine should have safety functions of Blood Leak Detector, Venous and Infusion Air Detector.

The CRRT Disposable offered should have maximum warranty hours of operation on therapies with Provision of separate availability of individual lines including Venous Line, Arterial Line, Dialysate line and Ultra filtrate/Substitute Line.



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TECHNICAL SPECIFICATION OF EQUIPMENT FOR AYUB TEACHING HOSPITAL.

1. 3 CHANNEL ECG MACHINES.

- a. Integrated rechargeable battery for at least 120min or more of normal use.
- b. ECG interpretation software consistent with current/latest STEMI guidelines.
- c. 5 inch or more color LCD screen for viewing traces and input of patients details
- d. QWERTY Pad Main and battery operation
- e. Tabs electrode option
- f. Advance filter for baseline electrical and muscle tremor interference
- g. Copy print out option automatic and manual mode option.
- h. Print review capability option if possible.
- i. Defibrillation protection thermal recorder for printout and pc print out option and ECG
- j. Storage of 50 ECG OR MORE.
- k. Z folds ECG paper/ ECG Roll
- l. Choice of six/12 leads and 4x3 plus rhythm strips.

M. J. Mansoor

6-CHANNEL ECG MACHINE WITH COMPLETE ACCESSORIES AND THERMAL HEAD HAVING:

- BRIGHT BACKLIT COLOR LCD 5.7" or more LCD Display.
- 12-LEAD ECG SIMULTANEOUS DISPLAY. UNIT SHOULD BE CAPABLE TO EXTEND ECG IN CASE ANY ARRHYTHMIA OCCURS.
- HIGH LEVEL 12-LEAD ECG ANALYSIS PROGRAM OF AT LEAST 200 FINDINGS.
- LATEST INTERPRETATION PROGRAM AND ALPHA NUMERIC KEYBOARD FOR PATIENT ID INPUT AND REPORTING.
- BATTERY BACK-UP OF AT LEAST 60 MINUTES CONTINUOUS RECORDING.
- LARGE DATA STORAGE OF 1000 OR MORE ECG FILES.
- 6-ECG TRACES RECORDING ON 110MM PAPER.
- PROVISION OF TRANSFERRING WAVE FORMS AND ANALYSIS RESULTS TO A PC.
- EASY DATA TRANSFER BY USB OR WIRELESS LAN.
- PATIENTS PRINTING DENSITY OF 200DPI (8 DOTS/MM), 320 DOTS/MM² (25MM/SEC.) WITH PAPER SPEED OF 10, 12.5, 25, 50MM/SEC.
- SENSITIVITY: 5, 10, 20MM/mV
- Built-in thermal array recorder records 6 ECG traces on 110 mm paper .
- Waveforms and analysis results can be transferred to a PC (ECG Viewer software).
- LAN Connectivity.
- Rhythm lead recording facility.
- Cascaded ECG recorded for one minute facility.
- 1 or 3 channel rhythm lead recording should be selectable.

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