

PVMS OF CARDIAC SURGERY

DRAFT

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Clinical Specialty	Cardiac Surgery
Generic Name	Heart and Lung Machine
Clinical Purpose	Cardiopulmonary bypass (CPB) is a technique that temporarily takes over the function of the heart and lungs during surgery, maintaining the circulation of blood and the oxygen content of the body. The CPB pump itself is often referred to as a heart–lung machine "the pump".
TECHNICAL SPECIFICATIONS	
<ul style="list-style-type: none"> • 05 Pump Complete Modular Pumps console with all Modular Parameter • 04 Single roller pump+1 Twin Pump or Two Small roller Pump • Dual Pressure module • Temperature module • Monitor interface module • Power supply module • Battery backup minimum 90min. • Level sensor • Ultrasonic Bubble detector • Flexible Led Lamp • Mechanical /Electronic Gas blender • Cardioplegia Monitoring Unit • System Control Panel • Venous occluding clamp. 	
05- Pump Console:	
<ul style="list-style-type: none"> • Heart Lung machine should have modular system. • The Console should have 05 pump attachment. • Smooth stainless steel, painted metal and aluminum. • Entire system should operate on battery system for a minimum of 90 Minutes For arterial pump battery backup should be 180 minute or more. • Switch over from main power to battery backup should be automatic and immediate. • Battery Unit should be built in to the pump base. • It should recharge automatically when the system is operating with main power supply. • Pump-console should have single cable connection from external power supply. • Provision for a connection to PC. • 24Volt operated socket for all pumps to avoid risk. • Should have hand crank facility as a safety feature with each pump • All the pump should have facility of pulsatile mode 	
System Control Monitor: Should display follow below components.	

<ul style="list-style-type: none"> • Pulsatile operation display.
<ul style="list-style-type: none"> • Pressure monitoring display.
<ul style="list-style-type: none"> • Temperature monitoring display.
<ul style="list-style-type: none"> • Timer system display.
<ul style="list-style-type: none"> • Battery voltage display.
<ul style="list-style-type: none"> • Safety buttons
<ul style="list-style-type: none"> • Alarm for shut down for any pump
<p>Cardioplegia monitoring unit:</p>
<ul style="list-style-type: none"> • It should display Volume ratio, timer, temperature, and pressure of full control of independent cardioplegia line.
<ul style="list-style-type: none"> • Master follower function and pump to stop
<p>Single Roller Pump:</p>
<ul style="list-style-type: none"> • The unit should have 5-pump compactly arranged with Universal connection
<ul style="list-style-type: none"> • Monitoring flow rates in LPM & RPM should be digitally display on the pump or equivalent
<ul style="list-style-type: none"> • Modules pump should have easy access connection for interchanging the pump with console.
<ul style="list-style-type: none"> • Pump should be peristaltic for durability and convince of handling.
<ul style="list-style-type: none"> • Roller pump should have a self-diagnostic circuit with provision to detect and display critical alarm conditions
<ul style="list-style-type: none"> • Each individual roller pump should be capable of running independently.
<ul style="list-style-type: none"> • Each Pump should operate onto 24 Volt.
<ul style="list-style-type: none"> • Roller Pump Range: 0-250 RPM
<ul style="list-style-type: none"> • Display of all pump condition on pump.
<ul style="list-style-type: none"> • Calibrations preset for ¼, 3/8 & ½ tubing.
<ul style="list-style-type: none"> • It should have Reverse flow capability.
<p>PRESSURE MONITOR: (Four pressure module)</p>
<ul style="list-style-type: none"> • Facility to monitor pressures.
<ul style="list-style-type: none"> • Along with necessary pressure transducers Kit, cables and domes reusable, with accurate digital display and alarm facilities audio and visual.
<ul style="list-style-type: none"> • It should have trend indicator and trend readout.
<ul style="list-style-type: none"> • Pole mounts for transducer Kit.
<p>TEMPERATURE MONITOR:</p>
<ul style="list-style-type: none"> • 04 temperature displays on Control panel for patient monitoring and for cardioplegia monitoring with digital display in Celsius.
<ul style="list-style-type: none"> • It should have trend indicator and trend readout.
<p>Air –Emboli module.</p>
<p>Level sensor:</p>
<ul style="list-style-type: none"> • With alarm settings. Should be able to provide both alert alarm for audible and visual

alarms or low blood level alarm
<ul style="list-style-type: none"> Level sensor pads 100 pcs
Air Bubble detector:
<ul style="list-style-type: none"> It should be ultrasonic in nature. Micro –bubble detection: Yes Bar Leds, sensor fault, override facility. Sensor should be compatible with all tubing sizes.
TIME MONITOR:
<ul style="list-style-type: none"> Minimum 3 time displays. With stop, reset and start function
Accessories: System Should be with all complete accessories.
Optional(if any):

Clinical Specialty	Cardiac Surgery
Generic Name	Online Arterial & Venous Line Monitoring
Clinical Purpose	The equipment to measure Arterial & Venous Parameter of blood in real time applications.

TECHNICAL SPECIFICATIONS
LCD display of 10” or better touch screen monitor
Monitoring of Arterial Line:
<ul style="list-style-type: none"> Measurement method for partial oxygen Measurement method for temperature Measurement of Hemoglobin, Arterial partial pressure of oxygen, Arterial temperature. PaO₂,
Monitoring venous line:
<ul style="list-style-type: none"> Measurement method for partial oxygen Measurement method for temperature. Measurement of Venous line, Hemoglobin, hematocrit, SvO₂ Interface for PC Connection Rs-232 Input /output USB Connection for Printer
Accessories:
<ul style="list-style-type: none"> Venous probe Arterial probe Venous temperature sensor Arterial Temperature sensor
System should be complete with all accessories

Optional(if any):

Clinical Specialty	Cardiac Surgery
Generic Name	Hypo Hyper Thermia Unit
Clinical Purpose	Hypo Hyper Thermia unit is used for temperature control (Hot & Cold) of patient during cardiac surgery.

TECHNICAL SPECIFICATIONS

The Hyper hypothermia unit designed to supply temperature controlled water to oxygenator heat exchangers and cooling blankets.

The feed water temperature selected on a temperature controller in the range 5-40 °C

One/ Two external circuits can be connected each with its own flow control

The flow is maintained by a built in pump

The temperature control is obtained by a three way motor valve

Selecting water from a cooling or a heating vessel as required,

In the cooling vessel a temperature of +2 °C is constantly maintained by a refrigeration system

Heating vessel contains an electrical heater which is automatically switched, as and when required.

Hermetically sealed compressor ½ HP.

Temperature accuracy: +/-0.5 deg/ C.

Initial cooling capacity 2100 kj/h (500 Kcal/h)

Continuous cooling cap 2800 kj/h (670 Kcal/h)

Circulating system: Pump

Flow capacity (Total) 10-16 liters/min

Accessories:

System should be complete with all standard accessories

Optional(if any):

Blankets

Clinical Specialty	Cardiac Surgery
Generic Name	Blood Warmer
Clinical Purpose	A blood warmer is used to warm blood prior to transfusion to a patient. Often used in emergency settings, operating rooms, and intensive care units to prevent hypothermia, the instrument warms blood to a temperature that is safe for infusion.

TECHNICAL SPECIFICATIONS

<p>FOR WARMING OF BLOOD BAGS MINIMUM THREE TO FOUR BAGS CAPACITY Temperature setting: +37°C to+44°C Microprocessor controlled unit Blood warmer Voltage: 220 V, 50 Hz</p>
<p>Accessories: Complete with standard accessories</p>
<p>Optional (If any):</p>

Clinical Specialty	Cardiac Surgery
Generic Name	Online Blood Warmer
Clinical Purpose	A blood warmer is used to warm blood prior to transfusion to a patient. Often used in emergency settings, operating rooms, and intensive care units to prevent hypothermia, the instrument warms blood to a temperature that is safe for infusion.
TECHNICAL SPECIFICATIONS	
<p>Microprocessor controlled unit for reliable transfusion and infusion for intra and post operative hypothermia. Dry warming system. On line warming with tubing. Pre-selected temperature settings over the range 35°C to 40°C. Indications/ display for different temperatures. Blood warming device with safety cut out at 41/42 °C. Visual and audible alarm for low and high temperature</p>	
<p>Accessories: Complete with standard accessories</p>	
<p>Optional (If any):</p>	

Clinical Specialty	Cardiac Surgery
Generic Name	Endoscopic Vessel Harvesting System
Clinical Purpose	Endoscopic vessel harvesting (EVH) is a surgical technique that may be used in conjunction with coronary artery bypass surgery (commonly called a "bypass"). For patients with coronary artery disease, a physician may recommend a bypass to reroute blood around blocked arteries to restore and improve blood flow and oxygen to the heart. To create the bypass graft, a surgeon will remove or "harvest" healthy blood vessels from another part of the body, often from the patient's leg or arm with small incision.

TECHNICAL SPECIFICATIONS

Full HD Camera Control Unit CMOS Type Compatible for Cardiac Harvesting Latest and advanced kit.

- a) Full HD Camera system with Latest Chip or Sensor
- b) Technology for brilliant image display CMOS
- c) Full HD image quality (1920 x 1080 pixel provides a crystal clear image)
 - Modes 5 Pre settings & 3 User settings
 - Scan Mode: Progressive Scan 50/60Hz
 - Video Signal Outputs 2 x DVI - D 1080p (50/60Hz)

Camera Head with Zoom coupler.

- a) Camera Resolution: 1920x1080 Pixel
- b) Buttons on Camera Head: 4 with 5 FUNCTIONS
- c) Optical Zoom 2x
- d) Digital zoom 2.5x
- e) Length Camera Cable: 4 M minimum

Harvester Cannula: Should consist with following parts.

- a) Harvesting Cannula
- b) Tool Adapter Port
- c) C-Ring Slider
- d) Harvesting Tool
- e) Jaws tool.
- f) C-Ring
- g) Harvesting Tool Extension Cable Connector
- h) Scope Washer Connector (blue)
- i) Distal Insufflation Connector
- j) Activation Toggle

Harvester Endoscope:

- a) 7mm extended length Telescope with Dissection Tip
- b) Target focus quality
- c) 0 Degree Straight forward.

Endoscopic Harvester Power Generator:

- a) Extension Cable Connector
- b) Power Cord Connector
- c) Power Setting Knob
- d) LED Power-On Indicator
- e) Hanger
- f) Harvester Extension cable
- g) Harvester Adapter

Light source :

- a) Xenon 300 watt or more
- b) Life span 500 hours on continuous use
- c) Light Guide Cable. 1 pcs.
- d) Color temperature 6000 Kelvin
- e) light intensity should be continuously adjustable

HIGH FLOW INSUFFLATOR:

- a) Maximum Gas Flow 20 L / min.
- b) Pressure Range 5 - 25 mm Hg
- c) Fully automatic insufflators
- d) High pressure tube 1m.
- e) Reusable silicon tube.

High Definition Medical Monitor with Bright LED Backlight.**Disposable Kit Harvester: 50 X Quantity :**

Included: Harvester Cannula with Traction device, Harvesting Bisector (Three in one Cutting, coagulation, and dissection), Trocar Cannulas, syringes.

Accessories:

Complete with Standard Accessories

Optional(if any):

Clinical Specialty	Cardiac Surgery
Generic Name	Centrifugal Pump
Clinical Purpose	Centrifugal pump can be used for extracorporeal membrane oxygenation (ECMO) or extracorporeal life support (ECLS) is an extracorporeal technique for providing both cardiac and respiratory support to persons whose heart and lungs are unable to provide an adequate amount of gas exchange to sustain life.
TECHNICAL SPECIFICATIONS	
Centrifugal Pump system should be used as a fully independent stand-alone unit and can be use as part of heart lung machine.	
Flow and bubble measuring function must be integral part of the Console	
Console should have With triple power supplies: mains, Heart Lung, or own batteries	
An adjustable holder allows optimal positioning of the drive unit.	
Emergency drive, a manual drive (hand crank) with speed indicator	
Specialized for ECMO, ECLS:	
Separate flow and speed displays	
Constant flow mode of operation	
Suitability for pulsatile operation	

Technologically advanced disposable pump head
Priming :60 ml or less
Flow : 0-08 l/min
Power supply / battery: 90 min
Mains power inlet cable.
Push and turn control knob
Accessories: Trolley imported from Manufacturer
Optional(if any): Specialized ECMO unit certified by FDA/CE/MHLW for 7/14 days or more

Clinical Specialty	Cardiac Surgery
Generic Name	ACT Machine(Activated Clotting Machine)
Clinical Purpose	Activated clotting time (ACT), also known as activated coagulation time is a test of coagulation

TECHNICAL SPECIFICATIONS
Microprocessor control including tests PT, APTT,ACT or any other
Used on both fresh and citrated whole blood sample
LCD display
Data storage for at-least 300 samples
Quality Control Check
Result printing capability
Accessories: Complete with at least 300 cartridge or more
Optional(if any): Dual/Single Chamber

Clinical Specialty	Cardiac Surgery
Generic Name	Fibrillator with Electrodes/Alligator Clamp
Clinical Purpose	Fibrillation is the rapid, irregular, and unsynchronized contraction of muscle fibers. An important occurrence is with regard to the heart.

TECHNICAL SPECIFICATIONS
Mode of Operation: Continuous
Permissible operating Temperature Range:+10°C to +40°C
Electrodes:

Fibrillator Electrode with double side
Fibrillator with bulldog clip and single plate electrodes
Fibrillator electrode with two bulldog clips
Accessories: Complete with all electrode and standard accessories
Optional(if any): Alligator Clamp

Clinical Specialty	Cardiac Surgery
Generic Name	Temperature management unit/Warmer Blanket
Clinical Purpose	Air Warming system helps maintain patient temperature and provide comfort before, during and after surgery. Reduces hypothermia during surgical procedures

TECHNICAL SPECIFICATIONS

Microprocessor controlled patient warming system for prevention of hypothermia.
 Temperature control range of 30 - 42°C.
 Individual control of blankets.
 Set and actual temperature display.
 Low noise fan.
 Heat conducting fabric for uniform distribution of heat.
 Fully automatic system for wide range of application.
 Complete system with filters.
 Automatic stop in case of overheating.
 Coupling for different type of blankets.
 Blankets should be washable, resistant to disinfectant and its cover should be blood and fluid resistant, replaceable type.
 220V, 50Hz operation.

Accessories:
 Arm shoulder blanket. 170x30 cm , Approx (02)
 Torso blanket 45x90 cm (01),Approx
 Leg blanket 45x90 cm, Approx (02)
 Recovery Blanket 120x200 cm, Approx (02)
 Any other as per requirement

Optional(if any):

Clinical Specialty	Cardiac Surgery
Generic Name	Hemodynamic Monitor(Less Invasive Advance Hemodynamic Monitoring)
Clinical Purpose	Advance Hemodynamic monitoring with invasive measurement of cardiac output and its determinants (pre load ,afterload, contractility) as well as the quantification of

	pulmonary oedema
TECHNICAL SPECIFICATIONS	
Less invasive hemodynamics monitoring of the cardiac output (CO) and other hemodynamic parameters, traditionally performed with the thermo dilution method	
Calibrated real-time Cardiac output and stroke volume	
Determination of preload volume and diagnosis of pulmonary oedema	
Afterload, contractility and volume responsiveness	
Calibrated real-time Cardiac output and stroke volume	
Stroke Volume (SV)	
Stroke Volume Variation (SVV)	
Cardiac Output (CO)	
Systemic Vascular Resistance (SVR)	
Continuous Blood Pressure (CBP)	
Stroke Volume (SV)	
wide high resolution Color screen/Touch screen	
Left Ventricular Contractility	
Accessories: Complete with all standard accessories	
Optional(if any):	

Clinical Specialty	Cardiac Surgery
Generic Name	Battery Operated Reciprocating Sternum Saw
Clinical Purpose	A sternal saw is a bone cutter used to perform median sternotomy, opening the patient's chest by splitting the breastbone, or sternum.
TECHNICAL SPECIFICATIONS	
Operated by a rechargeable battery	
Lightweight and handy. Keyless saw blade coupling	
May have even weight distribution for ideal balance	
Electronic parts may be integrated into battery pack	
The system should not require sterilization of the battery. Battery should be capable for multiple surgeries.	
The Saw must be easily sterilizable by autoclaving and plasma sterilization.	
It should have Battery charger for charging indications the batteries	
Sterilization Basket	
50 x Sternum Saw Blades	
Accessories: Complete with all standard accessories	
Optional(if any): one rechargeable battery	

Clinical Specialty	Cardiac Surgery
Generic Name	Reciprocating Sternum Saw Air Operated
Clinical Purpose	A sternal saw is a bone cutter used to perform median sternotomy, opening the patient's chest by splitting the breastbone, or sternum.
TECHNICAL SPECIFICATIONS	
Air Operated motor controlled unit. Compatible with in built and central Air supply	
Lightweight and handy. Keyless saw blade coupling	
May have even weight distribution for ideal balance	
Connecting Reusable Pipe And hand piece	
The SawConnecting Pipe and hand piece must be easily sterilizable by autoclaving and plasma sterilization.	
Sterilization Basket	
50 x Sternum Saw Blades	
Accessories: Complete with all standard accessories	
Optional(if any):	

Clinical Specialty	Cardiac Surgery
Generic Name	Reciprocating Sternum Saw electrically operated
Clinical Purpose	A sternal saw is a bone cutter used to perform median sternotomy, opening the patient's chest by splitting the breastbone, or sternum.
TECHNICAL SPECIFICATIONS	
Electrically(220v) Operated motor controlled unit.	
Lightweight and handy. Keyless saw blade coupling	
May have even weight distribution for ideal balance	
Water proof Foot control paddle, connecting cable for hand piece	
The Saw cable and hand piece must be easily sterilizable by autoclaving and plasma sterilization.	
Sterilization Basket	
50 x Sternum Saw Blades	
Accessories: Complete with all standard accessories	
Optional(if any):	

Clinical Specialty	Cardiac Surgery
Generic Name	Vacuum Assisted Venous Drainage Controller

Clinical Purpose	VAVD controller allows accurate regulation of vacuum applied to sealed blood reservoir for minimally invasive cardiovascular procedures with small incision, particularly in pediatric cardiac surgery and adult surgery.
TECHNICAL SPECIFICATIONS	
Mechanical regulator to allow Vacuum through sealed venous reservoir during Cardiovascular procedures.	
Both Pressure reliefs (Negative and positive) into the Vacuum controller.	
Sterile tubing set with moisture trap (Qty:20)	
The sterile tubing set with moisture trap provides correct, easy and safe connection between the controller and the reservoir and is recommended to be used with the controller	
Accessories: Complete with all standard accessories	
Optional(if any):	

Clinical Specialty	Cardiac Surgery
Generic Name	Stabilizer System for Beating Heart Surgery
Clinical Purpose	Cardiac Tissue Stabilizer system: for beating heart surgery or OPCAB (off-pump coronary artery bypass) to patients.
TECHNICAL SPECIFICATIONS	
Stabilizer should have a malleable foot that conforms to the heart for optimal placement, and foot suction pods to provide ideal stabilization and superb vessel presentation.	
Stabilizer should have a tri-slot socket which gives access to challenging vessels with "toes-up" or "toes-down" positioning.	
Accessories: Complete with all standard accessories	
Optional(if any):	

Clinical Specialty	Cardiac Surgery
Generic Name	Positioner System for Beating Heart Surgery
Clinical Purpose	Heart Positioner: securely lifts the heart for easy access to the coronary arteries with low-profile arm makes it easy to see and gain access to any target vessel.
TECHNICAL SPECIFICATIONS	
Active suspension technology allows normal cardiac motion and maintains stable hemodynamic	
Stabilization Systems should provide surgical access to and exposure of coronary arteries	
Accessories: Complete with all standard accessories	

Optional(if any):

Clinical Specialty	Cardiac Surgery
Generic Name	CO2 REMOVAL LUNG PROTECTION SYSTEM
Clinical Purpose	Lung Protection System allows clinicians to maintain protective ventilation even in severe cases of Acute respiratory distress syndrome or COPD (Chronique obstructive pulmonary disease). Respiratory failure without cardiac impairment: e.g. H1N1, bridge to lung transplant
TECHNICAL SPECIFICATIONS	
Extracorporeal support to replace or support the patient's circulation and respiration or equivalent.	
Possibility for patients who require Veno-Venous support & Veno-Arterial support	
Emergency patient transportation to restore and stabilize the patient's cardiopulmonary functions.	
Respiratory failure without cardiac impairment e. g. ARDS, bridge to lung transplant, support of gas exchange.	
Long term ventricular assist device with oxygenation possibility support of heart and lungs.	
Extracorporeal CO ₂ removal enables protective ventilation. Support of gas exchange for up to 29 days or more.	
Accessories: Complete with all standard accessories	
Optional(if any):	

Clinical Specialty	Cardiac Surgery
Generic Name	Blood Gas Analyzer
Clinical Purpose	An arterial blood gas (ABG) test is a blood gas test of blood from an artery; it is thus a blood test that measures the amounts of certain gases (such as oxygen and carbon dioxide) dissolved in arterial blood.
TECHNICAL SPECIFICATIONS	
Microprocessor based	
Blood Gas /PH/Electrolyte measuring system	
Control Panel With Easy Setting and monitoring	
Display of screen for display of result	
Easy 2 point calibration	
Calibration history at least 24 hours	
Easy Changing access to the electrodes and solutions	
Automatic sample recognition and sampling	
Possibility of upgrade data management	
Sampling techniques –whole blood	
Operate at 220VAC	
Accessories:	

Complete with all standard accessories
Optional(if any):

Clinical Specialty	Cardiac Surgery
Generic Name	Cell Saver (Intraoperative Cell Salvage Machine)
Clinical Purpose	Commonly known as a "cell saver", the intraoperative cell salvage machine suctions, washes, and filters blood so it can be given back to the patient's body instead of being thrown away. One advantage to this is the patient receives his/her own blood instead of donor blood, so there is no risk of contracting outside diseases

TECHNICAL SPECIFICATIONS	
Accessories:	
Complete with all standard accessories	
Optional(if any):	

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