GOVERNMENT OF THE PUNJAB
SPECIALIZED HEALTHCARE AND MEDICAL EDUCATION DEPARTMENT

Dated Lahore the 12th January, 2022

NOTIFICATION:

No. SO (Stand) 1-30/2020; In pursuance of the recommendations of the notified PVMS Committees, the Competent Authority has been pleased to approve the PVMS specifications of **Oncology, Endoscopy, Cardiac Surgery, Ophthalmology, OT & General Surgery and Urology (Annexure-A)** for all Procuring Agencies under the administrative control of SHC & ME Department.

2. The procurement process shall be carried out strictly in accordance with Punjab Procurement Rules-2014 and relevant rules/ regulations / policies.

3. Need of Procuring Agency for items (main/ optional) must be reasonably justified. However, optional items shall not be considered for financial comparison to determine the lowest evaluated bidder.

4. All the Procuring Agencies (Hospitals, Medical Colleges, Universities and Institutions) under administrative control of SHC&ME Department are bound to follow these PVMS Specifications. The already notified PVMS Specifications of aforementioned specialties are hereby repealed with immediate effect.

SECRETARY
SPECIALIZED HEALTHCARE AND MEDICAL EDUCATION DEPARTMENT

NO. & DATE EVEN:

A copy for information and necessary action is forwarded to:

1. All VCs & Principals of Medical & Health Institutions, SHC&ME Department, Govt. of the Punjab.
2. All Superintendents of Teaching Hospitals, SHC&ME Department, Govt. of the Punjab.
3. All Heads of Special Medical Institutions, SHC&ME Department, Govt. of the Punjab.
4. AS (D) to Secretary, SHC&ME Department, Govt. of the Punjab.
5. In-charge of ICT Cell, SHC&ME Department, Govt. of the Punjab, with the request to upload these PVMS Specification on the Departmental website.
6. PSO to Secretary, SHC&ME Department, Govt. of the Punjab.
7. PS to Special Secretary (PD&F), SHC&ME Department, Govt. of the Punjab.
8. PA to Additional Secretary (Procurement), SHC&ME Department, Govt. of the Punjab.

12/1/22

(Engr. Shahid Rasool)
SECTION OFFICER (STANDARDIZATION)

SPECIALIZED HEALTH CARE AND MEDICAL EDUCATION DEPARTMENT

GOVERNMENT OF THE PUNJAB

PRODUCT VOCABULARY MEDICAL STORE (PVMS) OF ONCOLOGY EQUIPMENT

Volume-I, 2021

TABLE OF CONTENTS

Note: The minor variation in sizes and values of equipment shall not be considered as reason of rejection.

Clinical Specialty	**Oncology**
Generic Name	**COBALT 60 TELETHERAPY UNIT**
Clinical Purpose	**Cobalt therapy or cobalt -60 therapies is the medical use of gamma rays from the radioisotope's cobalt-60 to treat conditions such as cancer.**

TECHNICAL SPECIFICATIONS:

COBALT SOURCE HEAD:

- Should be of cast steel shell/ lead with tungsten shield.
- Should hold a radioactive source up to 15,000 curies.
- SAD: 80 cm or more

COBALT SOURCE:

- Capacity: 175 to 200 c Gymm (Rmm) or better
- Size: max 2 cm
- Activity: 8000-12000 Curies
- Drawer Mechanism: Electric/Pneumatically
- Source driven: linear/rotational source drawer
- Head Leakage: 2 mR/hr at a distance of 1 meter
- Electronic online source position indicator (0-100%) displayed on treatment control panel
- Beam OFF safety mechanical/electronic lock

HEAD ROTATION:

- Swiveled manual rotation ±180 degree in either direction from the iso-center for precise setting of radiation axes of the beam.

COLLIMATOR:

- Manual/automatic adjustable divergent collimator assembly with fixed tungsten definer & leaves.
- Basic source to diaphragm distance**:** max 45cm

FIELD LIGHT AND OPTICAL DISTANCE INDICATOR:

- Precision of ODI: ±1mm at isocenter
- ODI range min 60 – 100 cm or more
- An automatic timer should turn OFF the field of light at the start of the treatment or after 2 minutes.

ACCESSORY MOUNTING/ SHIELDING KIT:

- One precise mechanical pointer for setting isocenter
- Standard safety shielding block/shielding kit with mounting tray

GANTRY:

- Should be capable of continuous rotation both in the clockwise and anti-clockwise with continuous speeds control.

- The range of gantry speed should be variable between 0.0125 rpm to 1.0 rpm.
- Iso-Centre height: max 116 cm above floor

STAND:

- Source Drawer Mechanism: The pneumatically driven linear source drawer on the COBALT-60 should be move the source between the fully shielded and fully exposed positions. A large air reservoir tank should be provided which should allow the source to cycle from the fully shielded position to the fully exposed position and back at least three times in thirty seconds.

CONTROL SYSTEM & INDICATORS:

- Control cabinet
  The control cabinet should house the source exposure control system based on two independent timers.

- Control console
  The control console should be located outside the treatment room featuring the following:
  - A push-button interface for Treatment Enable
  - Emergency Stop
  - Power on-off and Inhibit key switches
  - A LCD touch screen interface displays:
    - System information
    - Start up information
    - Set and actual unit parameters
    - Treatment time
    - Service screens showing status of unit by color coding of controls and voltage signals
    - System status and interlock information The service screens facilitate unit configuration, servicing and maintenance. Access to the system to be controlled by user authentication for the operator, administrator and technician.

- Hand control
  Ergonomically designed hand control should originate from the rear of the table. Backlit faceplate to be easily read during patient set-up. The hand control features to include:
  - Gantry rotation
  - Table vertical positioning
  - Room lights switch
  - Room lasers switch
  - Motion “enable” indicator
  - Motion enable bar
  - Emergency push-button

- Audible and visual indicators
  Audible and visual indicators inside the treatment room and at the control console to reflect the position of the source and unit status should be provided.

Safety and Protective Interlocks:

Emergency Stop Switches
"Off Shield" Interlock
Treatment Room Door Interlock
Low Air Pressure Interlock
Wedge Filter /Tray Interlock
Unexpected Motion Enable Interlock

Optical back pointer

Mechanical treatment distance indicator, 80 cm SSD

INTEGRATED TREATMENT TABLE:

- The patient positioning table to be completely integrated with the Cobalt-60 system. The table vertical motion should be motorized with max speed 2.25cm/sec from the hand control. All other motion to be manual with locking lever control.

Basic technical parameters:

- Vertical minimum position: 2 cm above isocenter, 37 cm (or more) below isocenter.
- Longitudinal 78cm or above
- Top rotation ±180
- Iso rotation ±110

IRRADIATION TIMER:

- The control cabinet should house the source exposure control system based on two Independent timers.

BEAM SHAPING ACCESSORIES:

- Set of universal one side insertion wedges (15, 30, 45, 60 deg) with different mechanical codes.
- Universal beam shaping box (possible used with wedges)
- Beam shaping kit should consist of
  - Lead blocks-set of 20 pieces. Thickness should be minimum 5 cm
  - Plain Plexiglas tray for variable positioning of blocks on tray
  - Slotted Plexiglas trays (min 10 pcs).
  - Half field block led shielding for field sizes up-to 10 x 20 cm

SEPARATE RADIATION LEAKAGE MONITORING IN ROOM ALARM:

- Continuous independent in room dose monitor with:
- Digital display of current dose rate in treatment room.
- Alarm generator for exceeding the set levels (3 levels).
- Visual and acoustical alarm for exceeding radiation safety level (near the entrance door).
- Integrating of current radiation value to treatment control panel.

LASER SYSTEM:

- 2 cross transversal lasers.
- 1 vertical sagital laser.
- All lasers switch on/Off button on hand pendant

TV INTERNAL CIRCIUT SET AND INTERCOM FACILITY

DOSIMETER FOR PRIMARY BEAM, FARMER TYPE VCC

RECORD AND VERIFY SYSTEM:

- Patient database system.
- Daily calendar with patient distribution.
- Time unlimited patient treatment history.
- Patient treatment report.
- Daily, weekly, monthly irradiator utilization report.
- Automatic patient data transfer to treatment control panel via computer network.
- Automatic import of radiation plan from treatment planning system.
- Continuous treatment quality check.

BEAM PHYSICS DATA:

- Isodose curve tables for all field size.
- Depth dose percentage table.
- Output factors for all field size.
- Trash factor
- Wedge profile for maximum field.
- Shielding block profile.
- Dose rate measurement during commissioning.
  Optional:
  - 100cm SAD System
- Multi Leaf Collimator(MLC)

TV SET AND INTERCOM FACILITY

DOSIMETER FOR PRIMARY BEAM, FARMER TYPE. VCC

CERTIFICATIONS:

- FDA or CE mark certificate
- Minimum compliance with
- IEC 60601-1-1 - Medical electrical equipment – Part 1-1: General requirements for safety Collateral standard: Safety requirements or medical electrical systems
- IEC 60601-1-2 Medical electrical equipment - Part 1-2: General requirements for basic safety and essential performance - Collateral Standard: Electromagnetic disturbances - Requirements and tests
- IEC 60601-2-11 - Medical electrical equipment - Part 2: Particular requirements for the safety of gamma beam therapy equipment

- National Council for Radiation Protection (NCRP #102)
- United States Food and Drug Administration (USFDA)
- United States Nuclear Regulatory Commission (USNRC)
- Council of the European Communities Medical Device Directive 93/42/EEC and 2007/47/EC
- International Commission for Radiation Units (ICRU#18)

DOCUMENTS:

- Operator manual (English)
- Service manual (English)

Clinical Specialty	**Oncology**
Generic Name	**BRACHYTHERAPY SYSTEM (Co-60)**
Clinical Purpose	**Brachytherapy** is a type of internal radiation therapy in which seeds, ribbons, or capsules that contain a radiation source are placed in your body, in or near the tumor.

TECHNICAL SPECIFICATIONS

EQUIPMENT MUST BE COMPLIANT WITH ALL INTERNATIONAL AND LOCAL STANDARDS AND REGULATIONS.

- Mobile Treatment Delivery unit with tungsten alloy source container
- Automatic length measurement and verification for precise applicator length
- Flexible single source construction.
- Backward/forward stepping source technology
- Battery powered DC motor source retraction system as back up for secure source return
- Manual source retraction system disconnecting the drive motor mechanism as second back up for source return security
- Integrated radiation detector
- Treatment Communication Console on a desktop PC, 22" (16:9 aspect ratio) TFT display
- Touch screen Treatment Control Panel display and controls entire treatment protocol.
- Brachy treatment plans can be imported into the Treatment Console from brachytherapy planning systems via network or external storage devices
- Supports DICOM plans and treatment records
- Support of up to 100 or above dwell points for treatment length of 400 mm or above per channel.
- Minimum stepping distance of 1 mm
- Source positioning accuracy of +/-1 mm.
- Continuation of interrupted treatments e. g. after an external power failure
- Support of up to 50 channels
- Support of up to 100 or above dwell points for treatment length of 400 mm or above per channel
- Quality assurance system and Tools
- Pre- and post- treatment report generation
- Individual user permission and password protection

RADIOACTIVE SOURCE:

- ISOTOPE type: Co-60

- Nominal source strength at delivery: 2.0 Ci +/- 10% (1.8 - 2.2 Ci)
- Active source dimensions: 0.5 x 3.5 mm
- Minimal catheter curvature: R = 13 mm
- Source movement: incremental Stepper motor at 30 cm/ Sec or better
- Surface contamination test to ISO 9978
- Leak testing meets requirements of ISO 2919
- Pellet construction: Active length of Co-60 Source 0.5mm x 3.5mm
- Maximum number of source transfers: 100,000 transfers, tests included a curved

applicator
- Source lifetime: 5 years

TREATMENT DELIVERY UNIT:

- AT least 20 channels: Support of up to 100 or above dwell points for treatment length of 400 mm or above per channel
- Line voltage: 100-240 VAC, 50/60 Hz
- Shielding material source container: Tungsten alloy
- Low maintenance modular drive system with low friction and touchless sensors
- Upgradable design with future potential
- Source position accuracy: 0.5 mm

STANDARDS (AS PER WHO AND IAEA):

- IEC, Medical Electrical Equipment, Part 2–17: Particular requirements for the basic safety and essential performance of automatically controlled brachytherapy after loading equipment, Rep. IEC 60601-2-17:2013 (91).
- ISO, Radiological protection – Sealed radioactive sources – General requirements and classification, ISO-2919:2012 (43).
- ISO, Radiation protection – Sealed radioactive sources – Leakage test methods, ISO-9978:1992 (92).
- IEC, Guidance on error and warning messages for software used in radiotherapy, IEC TR 63183:2019 (30).

BACKUP SUPPORT:

AN internal battery or UPS to ensure safe source or dummy retraction in the event of a power failure, including a crank for manual source retraction and an emergency container thick enough for storage of up to 91GBq cobalt-60 and large enough to fit the largest possible applicator.

MONITORING SYSTEM:

- A radiation area monitoring system with audible and visible signal for treatment room and control panel monitoring, warning lights, facility access interlock, patient intercommunication device, complete CCTV systems with pan, zoom and tilt facility.

TREATMENT TABLE:

- A patient treatment table, including head plate, removable leg plates, stirrups, seat plate extension and backrest maneuverability in order to treat a patient in the seated position. The tabletop shall be radiolucent to enable X-ray imaging.

QUALITY ASSURANCE:

- Quality Assurance system and tools supports the user in maintain high quality assurance standards with full digital documentation. It offers predefined quality assurance tests which are performed in sequence and verify whether the system and critical components are operating correctly.
- Source position adjustable by user (+/- 2 mm or better). Using the source alignment, you can achieve a dwell position accuracy of 0.5 mm or better
- Well chamber with Electrometer for source calibration
- The Automatic Length measurement allows for safe multi-channel applications as per

OEM standard.

TREATMENT PLANNING SYSTEM SPECIFICATIONS:

Hardware: A networked workstation with 23-inch monitor and significant storage capacity;

2D and 3D imaging (Support of X-ray, CT, MR, US and PET/CT Images)

Image registration / fusion

- Identity registration
- Mutual information (intensity-based) registration
- Landmark-based registration using three or more user defined points
- 3D surface-matching registration
- Manual registration
- Static ultrasound images can be imported via US

DICOM

- Film based reconstruction methods

CONTOURING:

(3D) contouring on fused images

- Slider to scroll between images
- Spyglass
- Checkerboard, rectangle and blended images display
- Continuous or polygon drawing
- Contouring on transverse, sagittal and coronal planes
- Contouring on any arbitrary plane
- Contour extrapolation and interpolation
- Boolean operations:
- Union (composition for PTV)
- Subtraction (wall extraction, e.g., bladder)
- 3D and 2D magic wand tool for automatic contouring
- Rapid volume contouring
- Magnifying glass to measure distance and angles
- Pearl tool
- Support for bifurcating structures

CATHETER RECONSTRUCTION / APPLICATOR PLACEMENT:

CATHETER / implant reconstruction techniques on films and CT/MR data sets

- 3D tomographic catheter reconstruction
- Reconstruction on arbitrary planes (Multi Planar)
- Slice by slice reconstruction
- Auto-recognition of catheters (plastic or metal)
- Definition of catheter offset
- Connector end / tip end
- Support of non-reconstructed catheters
- Reconstruction on registered datasets, using image fusion (optional)
- Supports film data entry from film scanner in JPEG and Bitmap format

• Describing points
• Tracking method / tracking between ends
• Use of
correspondence lines
Applicator modeling
• Applicator library manager
• Supports projective films, CT and MR data
• Measured source paths for ring applicators

DOSE CALCULATION:
• AAPM TG- 43 and TG -186
• Display of source strength and apparent source activity at calibration date and current date Advanced Collapsed cone Engine (ACE)
• Model-based dose calculation algorithm

DOSE OPTIMIZATION:
Forward optimization
• Manual
• Geometrical
• Graphical
• Dose point
• Inverse planning / optimization
• Inverse Planning Simulated Annealing (IPSA), with Dwell Time Deviation Constraint (DTDC)
• Hybrid Inverse Planning Optimization (HIPO), with Dwell Time Gradient Restriction (DTGR) and needle locking

DOSE EVALUATION:
PLAN evaluation and analysis
• DVH presets
• Live dose display tool in any plane and 3D
• Cold and hot spot display on any slice
• Cold and hot spot display in 3D view
• Multiple plan comparison
• Synchronized plans comparison

IMPORT / EXPORT REPORTING:
• Treatment plan printout
• Output manager
• Hardcopy isodose distributions
• User defined scaling
• Source decay tables
• Screenshots of current views

DICOM connectivity and export possibilities:
• Comprehensive DICOM implementation
• DICOM RT import and export for:
-- DICOM RT images
-- DICOM RT structure sets

-- DICOM RT plans
-- DICOM RT doses
-- DICOM query and retrieve
-- DICOM gateway to other DICOM compliant treatment planning systems
-- Plan export to Treatment Communication Console

SOURCE LOADING:

- Individual placements
- Step size (1.0 mm or above)
- Activation of all positions,
- Auto activation in target with definable margin
- Indexer length definition

SPECIAL POINTS:

- PATIENT points
- Applicator points
- Dose points of different types (axis, catheter, basal, on distance at lowest dose, on target surface) Coordinate system definition
- Extra coordinate systems such as applicator coordinate system and other user defined coordinate systems

LIBRARY PLAN:

- STORAGE of treatment plans in a library
- Sorting tools like body site and applicator type

SELECTION OF SYSTEM UNITS:

- SOURCE strength
- Dose
- Distance
- Apparent source activity as secondary unit (optional)

USER INTERFACE CUSTOMIZATION OPTIONS:

- SETS of isodose lines for multiple body sites
- Customizable workspaces
- Shortcut key combinations
- Displayed text information, scale markers, legends

REGION OF INTEREST CATALOG MANAGER:

- INSTITUTION-wide shared dictionary
- Contains structure labels, color, mass density and ROI type
- Implements standard DICOM structure types
- Structure set approval

MARGINING TOOLS:

- 3D margining: allows user-defined expansion margins in all 6 directions
- Differential margining: allows asymmetric margining

3D ADVANCED (VOLUME-BASED):

- INCLUDES IPSA and image registration
- Includes image registration
- A printer for A3/4 output of iso-dose distributions and treatment plan parameters.

APPLICATORS SPECIFICATIONS:

SAFETY FEATURES:

- The Firm shall supply details of the connection design and safety features that ensure that the applicator lines are attached to both the treatment unit and applicators or catheters in a fail-safe manner.
- All applicators shall provide a continuous and operator failure proof pathway for the radioactive source with connection outside the patient's body only.
- For all applicators supplied, the firm must take responsibility for warranty and validation with the after loading unit.
- The firm shall specify if these items are disposable or reusable.

CONNECTION TO AFTER LOADER:

- An interlock shall inhibit the movement of the radioactive source from the radiation shielded position if the applicator is not correctly connected. An appropriate warning indication shall occur in this case. The firm shall provide full details of the interlock sensing design and the procedure to follow when such error occurs.
- All treatment tubes used to connect needles and applicators must be of a constant length and have some method that maintains a constant and verifiable treatment length, to ensure precise source positioning.
- Disconnection / connection of the transit tube to the applicator should be easy

BODY SITE SPECIFIC:

The HDR system must have an extensive range of applicators available to treat all body sites including intraluminal, interstitial, superficial and intra cavity as well as those required for intraoperative treatments.

- CT/MR Applicator sets are to be provided for **gynecological** applications
- Applicator sets are to be provided for cervix, vaginal and endometrium
- A vaginal cylinder with Marker rings incorporated for x-ray imaging purposes shall be provided
- Mentioned applicators shall be suitable for steam sterilization
- Applicator sets are to be provided for **prostate** HDR applications:
- A conformal, light weight template shall be provided
- Mentioned templates shall be suitable for CT/MR compatible 5F and 6F needles which can be individually locked in position with reference to the template during application.

DOCUMENTS:

- Operator manual (English)
- Service manual (English)

Clinical Specialty	**Oncology**
Generic Name	**BRACHYTHERAPY SYSTEM (Ir-192)**
Clinical Purpose	**Brachytherapy is a type of internal radiation therapy in which seeds, ribbons, or capsules that contain a radiation source are placed in your body, in or near the tumor.**

TECHNICAL SPECIFICATIONS

Treatment Delivery Unit

• Mobile treatment delivery unit with built-in source container for approved storage of up to 444 GB q (12 Ci) Ir-192
• Dose equivalent rate at a 50 mm distance from the surface of the TDU: ≤ 0.01 mSv h× −1
• Source container material: tungsten
• Leak testing meets ISO 2919 requirements
• Forward stepping source technology
• Source position accuracy: < +1
• Source movement: incremental stepper motor at 50 cm/sec
• Cable drive for check cable with dummy source
• Channels: 24 or more
• Number of dwell positions: 60 or more with 1 mm step sizes
• Maximum treatment length: 400 mm or more
• Reference zero at entrance of applicator
• Height: 975 mm or more
• Width: 445 mm or more
• Dept: 567 mm or more
• Weight: 98 kg or above
• Power requirements: 200 W
• Line voltage: 100V-240 V & 50-60 Hz
• Uninterruptable Power Supply (UPS) with 10 minutes backup
• Integrated back-up battery

Radioactive Source

• Isotope type: Ir-192
• Source with flexible metal cable construction with a partially reduced diameter at the distal end
• Nominal source strength at delivery: 10 Ci +/-10% (9.0-11.0 Ci)
• Source capsule: stainless steel (Size: IO to Specify/As per end user requirement)
• Pellet construction: single solid Iridium rod, 0.6 x 3.5 mm
• Laser welded source to cable connection with additional protective collar for extra durability
• Source cable diameter: 0.85 mm or above
• Minimal catheter curvature: R = 13 mm
• Finished device test includes 100% visual inspection and dimensional verification
• Surface contamination test according to ISO 9978
• International standards to which sources conform: ISO 2919, ISO 9978, IAEA ST1

Quality Assurance

• Built-in QA components to ensure safe and reliable system operation
  - check cable to detect catheter obstructions in connected transfer tubes and applicators

- modular precision source drives that permanently monitor all source steps made
- channel selector that permanently monitors all transfer tube connections to after loader
- battery powered DC motor source retraction system
- detection of source retraction by proximity switches detection of source retraction by mechanical end stop
- integrated radiation detector for source return confirmation
- manual source retraction option with drive motor disconnection mechanism

• Source position accuracy verification using a source position check ruler and digital camera source position adjustable by user (+/- 2 mm)
• Source activity verification by well chamber for source calibration
• Source wipe procedure for detection of radiation contamination using the source exchange and wipe tool
• Independent room radiation monitoring system with radiation warning lights column outside the treatment room to detect radiation in the treatment room
• User ID and password protection

Treatment Control Console

• Time-saving intuitive user interface provides clear treatment delivery workflow guidance for operator
• Clear module selection
• treatment
• plan manager
• maintenance
• reports
• QA
• Patient plan and system information at a glance
• Information bar shows system status and next steps in workflow
• System checklist provides continuously status and safety information
• Visual display of channels and dwell positions using a color scheme showing exact status of source and dwell positions
• Supports import of DICOM treatment plans and treatment records via network or external storage devices
• Connects seamlessly with MOSAIQR and other DICOM unified worklist compliant oncology information
• Systems
• Simple creation and editing of plans via Plan Manager module
• Pre- and post-treatment report generation
• Local database for patient plans and reports
• Individual user permission and password protection
• All TCC functionality is delivered on a standard desktop PC, with 22” TFT display

Treatment Control Panel

• Separate touch screen interface to control treatment delivery
• Powered by and directly connected to the treatment delivery unit
• Displays an alarm and code in alarm conditions
• Produces an audio alarm in alarm conditions
• Table top panel with emergency button
• During treatment, the remaining treatment time and radiation status are displayed

• Height: 219 mm
• Width: 195 mm
• Depth: 150 mm
• Weight: 5 kg (11 lbs)
• Multiple service options to support you and maintain your system for optimum reliability and safety
• An unprecedented range of brachytherapy training and education options that bring you up to speed with current practice and novel brachytherapy approaches
• Upgradable design to future innovations

TREATMEMT PLANNING SYSTEM SPECIFICATIONS
2D and 3D imaging (Support of X-ray, CT, MR, US and PET/CT Images)
Image registration / fusion
• Identity registration
• Mutual information (intensity-based) registration
• Landmark-based registration using three or more user defined points
• 3D surface-matching registration
• Manual registration
• Static ultrasound images can be imported via US DICO Mizer
Film based reconstruction methods
Contouring
(3D) contouring on fused images
• Slider to scroll between images
• Spyglass
• Checkerboard, rectangle and blended images display
• Continuous or polygon drawing
• Contouring on transverse, sagittal and coronal planes
• Contouring on any arbitrary plane
• Contour extrapolation and interpolation
• Boolean operations:
- Union (composition for PTV)
- Subtraction (wall extraction, e.g. bladder)
• 3D and 2D magic wand tool for automatic contouring
• Rapid volume contouring
• Magnifying glass to measure distance and angles
• Pearl tool
• Support for bifurcating structures

Catheter Reconstruction / Applicator Placement
Catheter / implant reconstruction techniques on films and
CT/MR data sets
• 3D tomographic catheter reconstruction
• Reconstruction on arbitrary planes (Multi Planar)
• Slice by slice reconstruction
• Auto-recognition of catheters (plastic or metal)
• Definition of catheter offset
• Connector end / tip end
• Support of non-reconstructed catheters

• Reconstruction on registered datasets, using image fusion (optional)
• Supports film data entry from film scanner in JPEG and Bitmap format
• Describing points
• Tracking method / tracking between ends
• Use of correspondence lines
Applicator modeling
• Applicator library manager
• Supports our gynecological applicators, including shielded applicators
• Supports projective films, CT and MR data
• Measured source paths for ring applicators

Dose Calculation

• AAPM TG-43 and TG-186
• Active length: maximum 47 cm
• Implant size: maximum 90 catheters
• Display of source strength and apparent source activity at calibration date and current date
• Advanced Collapsed cone Engine (ACE)
• Model-based dose calculation algorithm
• Allows to follow the AAPM TG-186 recommendations

Dose Optimization

Forward optimization
• Manual
• Geometrical
• Graphical
• Dose point
Inverse planning / optimization
• Inverse Planning Simulated Annealing (IPSA), with Dwell Time Deviation Constraint (DTDC)
• Hybrid Inverse Planning Optimization (HIPO), with
Dwell Time Gradient Restriction (DTGR) and needle locking

Dose Evaluation

Plan evaluation and analysis
• DVH presets
• Live dose display tool in any plane and 3D
• Cold and hot spot display on any slice
• Cold and hot spot display in 3D view
• Multiple plan comparison
• Synchronized plans comparison

Import / Export

Reporting
• Treatment plan printout
• Output manager
• Hardcopy isodose distributions
• User defined scaling
• Source decay tables
• Screenshots of current views

DICOM connectivity and export possibilities

- Comprehensive DICOM implementation
- DICOM RT import and export for:
    - DICOM RT images
    - DICOM RT structure sets
    - DICOM RT plans
    - DICOM RT doses
    - DICOM query and retrieve
    - DICOM gateway to other DICOM compliant treatment planning systems
- Plan export to Treatment Communication Console

Source loading

- Individual placements
- Step size (1.0 mm)
- Activation of all positions, every second, every nth position
- Copy / paste source positions
- Auto activation in target with definable margin
- Indexer length definition

User interface customization options

- Sets of isodose lines for multiple body sites
- Customizable workspaces
- Shortcut key combinations Displayed text information, scale markers, legends

Region of Interest catalog manager

- Institution-wide shared dictionary
- Contains structure labels, color, mass density and ROI type
- Implements standard DICOM structure types
- Structure set approval

Margining tools

- 3D margining: allows user-defined expansion margins in all 6 directions
- Differential margining: allows asymmetric margining

3D advanced (volume-based)

- Includes IPSA and image registration
- Includes image registration

APPLICATORS SPECIFICATIONS

- **Safety features**
- The respondent shall supply details of the connection design and safety features that ensure that the applicator lines are attached to both the treatment unit and applicators or catheters in a fail-safe manner.
- All applicators shall provide a continuous and operator failure proof pathway for the radioactive source with connection outside the patient's body only
- For all applicators supplied by the respondent, the respondent must take responsibility for warranty and validation with the after loading unit.
- The respondent shall specify if these items are disposable or reusable.

Connection to after-loader

- An interlock shall inhibit the movement of the radioactive source from the radiation shielded

position if the applicator is not correctly connected. An appropriate warning indication shall occur in this case. The respondent shall provide full details of the interlock sensing design and the procedure to follow when such error occurs.

- All treatment tubes used to connect needles and applicators must be of a constant length and have some method that maintains a constant and verifiable treatment length, to ensure precise source positioning.
- Disconnection / connection of the transit tube to the applicator should be easy

Body site specific

- The HDR system must have an extensive range of applicators available to treat all body sites including intraluminal, interstitial, superficial and intracavitary as well as those required for intra-operative treatments

Body sites specific

- Advance CT/MR Applicator sets are to be provided for **gynecological** applications
- Applicator sets are to be provided for cervix, vaginal and endometrium.
- A vaginal cylinder with shielding possibilities to protect organs at risk shall be provided.
- A vaginal cylinder with Marker rings incorporated for x-ray imaging purposes shall be provided
- Mentioned applicators shall be suitable for steam sterilization
- Applicator sets are to be provided for **prostate** HDR applications
- A conformal, light weight template shall be provided
- Mentioned templates shall be suitable for CT/MR compatible 5F and 6F needles which can be individually locked in position with reference to the template during application
- Applicator sets are to be provided for **breast**
- Lightweight CT/MR compatible template shall be provided in different sizes and grid spacing's, with a minimum of 10mm, for conformal interstitial breast applications. Describe materials used and configurations.
- Mentioned templates shall be suitable for CT/MR compatible catheter systems
- Mentioned templates shall be suitable for steam sterilization

Imaging & Modeling

- Provider should specify whether all applicators are CT/MRI compatible and the type of material used
- Provider should specify if there are any preventive measures for accurate applicator reconstruction in treatment software
- Markers for x-ray imaging of the quoted applicator sets shall be provide

Clinical Specialty	**Oncology**
Generic Name	**X-RAY BLOOD IRRADIATOR**
Clinical Purpose	X-RAY Blood Irradiator is specifically designed to prevent Transfusion Associated- Graft versus Host Disease (TA-GvHD), a rare but often fatal reaction caused by the donors' Lymphocytes-T when grafted into a recipient with a transfused blood product.

TECHNICAL SPECIFICATIONS

Consisting of:

- Self-shielded, floor standing unit with integrated water-cooling system.
- Should have a microprocessor based, blood irradiator system to reduce the risk of TA-GVHD (Transfusion-Associated Graft Versus Host Disease).
- Capable of irradiating 6 blood bags(600mL). Can process blood bags, platelets bags and drawn/loaded syringes up-to 60 ml in the same cycle.
- Have an overall dose uniformity ratio (DUR) of 1.5 or less.
- Should be capable of operating continuously.
- Operate in the temperature range 10 – 40 °C and in the relative humidity range 20 -80%;
- Friendly user interface display with touch screen.
- Should be X-ray-based irradiation emission.
- Time to deliver 25 Gy (center) to Blood Products to be less than 5 minutes
- X-ray tube capable to deliver 5 Gy/min or better.
- High output long life X-ray tube: 160 KV, 12mA, working life not less than 5 years.
- Power Supply 4KW
- Programming functions should be password-protected with smart card access.
- Should have a 2 safety interlocks.
- LAN/Ethernet connectivity to outside computer and printer.
- Optional: Barcode scanner able to scan key bar-coded parameters from the blood bag.
- Voltage: 240V, 50/60 Hz Single Phase 30 Amp
- Two sets of canisters with locking lids to fit the irradiation volume(s) made of durable, washable radio- transparent material to be supplied.
- QC/Calibration/dose mapping required to check the functionality of system. Specify and supply

Certification:

- FDA / CE

Clinical Specialty	Oncology
Generic Name	**CT SIMULATOR** LARGE BORE 32 SLICES CT SIMULATION SYSTEM
Clinical Purpose	**CT simulation is to determine the exact location, shape and size of the tumor to be treated. Patients are imaged on a CT scanner specially configured to acquire three dimensional images used for treatment planning. This CT scanner allows the radiation oncologist to localize the tumor and surrounding areas that will require radiation treatments.**

TECHNICAL SPECIFICATIONS

GANTRY:

- Gantry bore to be at least 80cm or more.
- Minimum gantry rotation speed to be at least 0.5sec for generation of 32-slices per 360-degree rotation or better.
- System should be able to acquire helical spiral scan.
- Maximum Scan field of view to be 50cm or more.
- Extended field of view to be 70cm or more.
- Minimum slice thickness: 0.625mm or less.

TUBE:

- Heat storage capacity of at least 7 MHU or more.
- Anode heat dissipation of at least 1000kHU or more.
- Generator output of at least 600mA or more.

GENERATOR & DETECTOR:

- High frequency type. Maximum power of at least 70kW or more.
- Dose reduction hardware/software.
- Calculate patient dose in milli-Gray preferably before axial acquisition.
- Low contrast delectability (LCD) calculated on a catphan CT phantom of 5mm or less resolution with a CT Number of 3 HU (0.3%) contrast difference.
- Scan length of at least 1.6 meters or more of helical or axial scans in a single acquisition.
- Detector should be of same material as used in company's top end CT scanner to ensure best and lowest dose detector.

TABLE:

- Carbon fiber
- Single acquisition scan range of at least 1.6 meter or more.
- Scans with at least 0.25 mm accuracy on a 200Kg patients.

RESPIRATORY – GATED SCAN SYSTEM:

- Respiratory-gated scan system and Respiratory-gating system reconstruction should be provided for prospective and retrospective respiration gated images.
- Capable of 4D acquisition with retrospective gating
- Phase average reconstruction for range of motion tracking in a single scan.

CONSOLE COMPUTER:

- System architecture and operating system must be based on latest technology.
- Multi-tasking and parallel processing CPU system. Dual Xeon processor.
- Hard disk capacity of main computer system should be at least 300,000 images or more
- Capable of storing at least 3000 raw data files rotation or 100GB raw data.
- Image reconstruction at 10 images/frames per second or better at 512 x 512 matrix.
- Console monitor of color 19" TFT type. Dual monitors to be provided one for acquisition and the other for review and processing.
- MOD / DVD / CDR.

ADDITIONAL WORKSTATION:

- High-speed links to the operator console on DICOM network.
- System architecture and operating system must be based on latest Dual / Quad Core Xeon processor of 2.0GHz with 512kb cache.
- Should have one Hi-resolution LCD/TFT screen of 18 inch or more.
- CD / DVD writer
- DICOM viewer with universal PC display capability (licensed).
- Color laser printer, A4 size, high resolution.

SOFTWARES:

4D viewing on console/workstation for tumor tracking offering following minimum functions.

- Direct scan to plan functionality at the scanner console/workstation should be available.
- Tools to assist in patient marking and virtual simulation for Radiation Therapy Planning including Iso-center localization (Multiple) with coordinates programmed into the moveable laser, contouring, creating beam arrangements, generating MLC and blocks, setting machine definitions, creating MIP, 4D reviews, IP's and ITVs at console or workstation
- Create 2D/3D structures/DRR at console or workstation
- Define volume for planning and radiotherapy on console/workstation
- Read skin source distance on console/workstation
- True isotropic volume acquisition both at console and workstation.
- Vessel stenosis analysis at workstation.
- 3D surface rendering both at console and workstation
- Curved planer reformation at console.
- Contrast media based synchronizing software at console.
- Virtual endoscopy / colonoscopy / bronchoscopy at workstation.
- Iterative Dose Reduction should be provided in the system for low dose scans. This is mandatory requirement.
- Pediatric scanning package.

INTEGRATED/SEPARATE WORKSTATION FOR CT SIMULATION:

- CT simulation workstation with complete hardware including widescreen medical grade 19" LCD / TFT monitor, networking with treatment planning system and DICOM RT import / export licenses. 3D virtual simulation software for advanced image manipulation, rapid auto contouring, treatment field design and visualization. Automatic determination of MLC leaf position and image registration of multimodality images. System should be compatible with LINAC.

NOTE:

- Console and workstation should be capable of independent working (If workstation is not integrated)
- A bi-directional speaker communication shall be provided between the operator and the patient.
- A CCTV system to view the patient within the gantry bore.

INTEGRATED/SEPRATE MOVABLE LASER SYSTEM:

- Movable Laser System should have 3 / 4 (IO to specify) computer controlled RED lasers (two fixed crosshair lasers at the sides and a rail with a fixed transversal line and a movable sagittal line at the ceiling) for marking the isocenter and reference points of patient's body along with Laser's control system on a Tablet.
- Integrated or External Laser system alignment Phantom for calibration of lasers should also be provided.

DICOM 3 CAPABILITY:

- DICOM 3 Capability for Send, Receive, Archive, Retrieve and Print.

QUALITY AND SAFETY STANDARDS:

- MDD (CE) compliance.
- FDA 510 K approval.

POWER REQUIREMENT:

- Three-phase with line voltage of 220 V, 50Hz.

ACCESSORIES:

- DICOM compatible Dry Laser/Thermal camera, multi size up to 14" x 17".
- On line sine wave UPS for whole system with a minimum back up of 10 minutes on full load.
- Lead glass for control room 100cm x 150cm 0.5 mm Pb. Equivalent.
- Dual head programmable Power injector with flow/volume and temp control capable of simultaneous injection of both contrast and saline. Mounted on mobile base with 100 syringes of 150 ml capacity and connecting tubes

QUALITY ASSURANCE TOOLS/PHANTOMS:

- Standard set of phantoms for calibration of CT.
- Necessary phantom to check the spatial resolution of the scanner should be provided. A special phantom to check the electron density - HU relationship for the different body tissues should be provided.
- Internal/External Laser system alignment Phantom for calibration of lasers should also be provided.

Certification:

FDA / CE

Clinical Specialty	**Oncology**
Generic Name	**RADIOGRAPHIC / FLUOROSCOPIC SIMULATOR**
Clinical Purpose	Computer simulation of radiography can be used for different purposes in NDT, such as qualification of NDT systems, optimization of radiographic parameters, feasibility analysis, model-based data interpretation, and training of NDT/NDE personnel BAM has been working on modeling in the field of radiographic testing for many years.

TECHINCAL SPECIFICATION

GENERATOR

- 50 KW or more high frequency
- Radiographic KVP range of 40 – 150 KVP or better
- Fluoroscopic KVP range of 40 – 125 KVP or better
- MAS range .5 to 1000; anatomical or better
- Programs and technique selections of KVP, KVP /MAS / time

X-RAY TUB

- 400 KHU
- Focal spots .6 x .6 and 1.0 x 1.0
- Target angle 14º

DIGITAL IMAGE AQUISITION SYSTEM

- 12-inch tri field Image Intensifier
- Coverage: 12" / 9" / 6" diameters
- Automatic “S” Distortion Correction
- 1024 X 1024 Digital video camera
- One High resolution monochrome video monitor
- Digital image processing computer

FILM CASSETTE HOLDER

- Manual rotation of + 90º
- Film size 35 cm x 43 cm,
- Anti-collision touch guard
- X-ray field size 1 x 1 cm to 55 x 55 cm at 100 cm sad
- Source to skin optical distance indicator 60 cm to 200 cm 8:1 Ratio Grid

FIELD WIRES

- Asymmetrical and symmetrical mode
- Field size of 2 x 2 to 45 x 45 cm at 100 cm SAD

CUSTOMIZED BLOCKING TRAY HOLDER:

- Should be Manufactured to match the department’s treatment machine

PEDESTAL AND MOTORIZED GANTRY

- Variable source to axis distance of 80 to 120 cm
- Isocenter height 126 cm (± 5mm)

PATIENT SUPPORT ASSEMBLY

Motorized with free float in lateral and longitudinal direction

- Motorized lift with a 220 kg capacity
- Tabletop of carbon fiber with the transmission equivalence of 1.0 mm aluminum
- Indexing Table Top with accessory bar for precise patient set up

SIMULATOR INFORMATION DISPLAY MONITOR:

- Two should be provided, one local (17" flat panel or technical equivalent) and one remote
  (17" flat panel or technical equivalent)

CONTROL SYSTEM:

Windows operating system

- Local area network connection (LAN) should be included
- Built-in SIM-NT calibration software
- International control symbols

THREE ALIGNMENT LASERS:

- (Solid state diode type) 2 lateral, 1 sagittal

OPERATOR CONTROLS:

One - Control Room Operator Console

- One – Operator Hand Pendant tethered to the couch in patient area, re-connectable to either side of the couch for operator convenience

Clinical Specialty	Oncology
Generic Name	**16 Slice SPECT CT**
Clinical Purpose	The latest generation SPECT CT system for whole body SPECT examination with advance applications and must be upgradable to highest level. CT scanner must be capable to be used as standalone CT for routine CT examinations.

KEY FEATURES:

- Automatic body contouring with Circular and non-circular body-contour orbit
- Multimodality viewing software
- Planar (static) acquisition
- Dynamic acquisition
- Whole-body acquisition
- Whole-body SPECT acquisition
- Gated acquisition
- Gated SPECT acquisition
- Dynamic SPECT acquisition
- Filtered back projection
- F3D iterative reconstruction
- Scatter correction
- CT attenuation correction
- Cardiac half-time imaging
- Gated study beat normalization
- Automatic and manual motion correction

GANTRY SPECIFICATIONS:

- Open gantry design min. 70 cm or more
- Depth 220 cm or less
- Patient positioning monitors with min.15" flat panel color LCD display

SPECT DETECTOR TECHNICAL SPECIFICATIONS:

- True rectangular FOV of 38 x 53 cm
- Diagonal FOV 65 cm or more
- Photomultiplier tubes: 55 or more
- Variable PMT selection ensures high resolution for all multi-energy and multi-peak applications
- Crystal variation correction for optimal uniformity and linearity across all energies
- Single source (Co-57 or Tc-99m) tunes the detector for all energies
- Energy range: Min 40 or less
  Max-585 keV or more
- SPECT Reconstruction Matrix Size 256 x 256, 128x128, 64x64
- Number of CT Slices/Rotation: 16 or more
- CT Continuous Scan Length 185 cm or more
- Tube Anode Heat Storage Capacity 5.0 MHU or more
- Max. Tube Voltage :130 kV or more
- Tube Current range: min 20 to 345 mAs or more
- Min. Generator Power: 50 kW or more

INTRINSIC SPATIAL RESOLUTION:

- FWHM in CFOV ≤3.8 mm or better
- FWHM in UFOV ≤3.9 mm or better
- FWTM in CFOV ≤7.5 mm or better
- FWTM in UFOV ≤7.7 mm or better

INTRINSIC SPATIAL LINEARITY:

- DIFFERENTIAL in CFOV ≤0.2 mm or better
- Differential in UFOV ≤0.2 mm or better
- Absolute in CFOV ≤0.4 mm or better
- Absolute in UFOV ≤0.7 mm or better
- System Spatial Resolution with Scatter (LEHR at 10 cm)
- FWHM in CFOV ≤8.3 mm or better
- FWTM in CFOV ≤18.6 mm or better
- System Planar Sensitivity (LEHR at 10 cm)
- Absolute 200 cpm/µCi or better
- Type Bialkali high-efficiency box-type dynodes Array Hexagonal
- System should have 02 Variable Angle high-definition SPECT detectors with CT bore opening of min. 70 cm.
- SPECT detectors can be configured at 76° or 90° for cardiac applications and at 180° for all other whole body and general protocols.

CT SPECIFICATIONS:

- Spiral CT scanner capable to acquire 16 slices per rotation
- Generator power: 50kW or more
- Tube anode heat storage capacity: 5 MHU or better
- Tube current range: 20-345 mAs
- KV range: 80 – 130 kV
- Rotation speed min. 0.5 sec or less per revolution.
- The gantry must support circular and non-circular orbits.
- Auto contour, with infrared real-time body contouring should be standard with system to minimize patient to collimator distance to min. 1.1 cm (0.45 in.) in Whole Body and SPECT non-circular orbit acquisition modes.
- All motorized motions of the system are controlled from the hand controller.
- Touch screen flat panel patient positioning monitor/ patient positioning display on gantry for following functions:
- Patient positioning with window and persistence adjustment
- Acquisition parameter display on screen.
- Camera information (detector and bed positions)
- Gantry control (reconfiguration, collimator change, offset zoom, and adjusting the CT acquisition limits.)

PATIENT BED:

- Patient friendly design of the imaging bed with 40 cm or more width
- Carbon fiber pallet, supporting patient weights up to 225 kg or better.
- Minimum bed height should be 60 cm or less
- Programmable table positions for wheelchairs and gurneys patients

- Integrated rulers on each side of the patient bed, allow for quick whole body set up.
- The patient bed can be easily pivoted to the side for rail-free access of sitting/standing patients, wheelchairs, imaging tables, gurneys and hospital beds.

ACQUISITION WORKPLACE:

- User friendly workstation with a multi-modality graphical user interface, keyboard and mouse.
- SPECT and CT acquisition, quality control and display must be integrated in single workstation.
- Wide variety of clinical protocols must be included in system.

SPECT ACQUISITION FEATURES:

- Planar static and dynamic
- Whole Body SPECT
- Gated SPECT
- Dynamic SPECT
- 4-5 min. cardiac imaging using standard dose or quarter dose cardiac imaging capability must be standard with the system
- The system must remember and store all parameters for each clinical protocol, the workflow should automatically print, archive, and distribute the results to other devices on network.
- Quality Control features should be standard with system
- 3D Orientation for Cardiac and general exams should be supported to up to 3 additional volumes.
- Multiple techniques must be available for accurate registration of your acquired images.
- The reconstruction engine should support up to 5 multi-isotope studies concurrently.
- Standard SPECT as well as whole body, dynamic and gated cardiac volumes can be created.
- Flash Iterative Technologies for improved resolution
- CT Attenuation Correction for high quality CT data to correct for attenuation and increase reading accuracy.
- Scatter Correction projection from generalized dual-or triple energy window method to compensate for scatter during the iterative reconstruction process.

CT ACQUISITION MODES:

- Topogram, scanning perspectives: anterior-posterior (ap), posterior-anterior (pa), lateral (lat)
- Spiral CT, continuous volume scanning technique with uninterrupted table feed in the multi-rotation mode
- Sequential CT, incremental, slice-by-slice imaging mode with no table movement during data acquisition

CT FEATURES:

- Real-time x-ray dose management for all scan modes.
- Ultra-low dose examinations for pediatric patients.

COLLIMATORS:

- Low Energy High Resolution Collimator
- Low Energy All-purpose Collimator
- High Energy Collimator
- Collimator cart

FAST POST PROCESSING WORKSTATION THAT OFFERS:

- Workflow based architecture
- DICOM networking, printing
- User configurable displays
- 3D Orientation
- Image Fusion

ADVANCE POST PROCESSING FEATURES:

- 4DM SPECT for various Calcium Scores (Agatston, volume and calcium mass) to assess the risk of a cardiac infarct within user-defined regions for up to four coronary arteries. Visualization and localization consist of a functional VRT (Volume Rendering Technique) fused with an anatomical VRT, with a unique, real-time reorientation based on 3D volumetric images.
- ½ time whole body imaging must be quoted as option (7-8 min whole body imaging)

CARDIAC PROCESSING FEATURES:

- Process up to 4 series simultaneously
- Mixed Non-Gated, Gated, Profile series simultaneously Profile simultaneous AC and Non-AC Multi- Isotope support (6 per series)
- Filtered Back projection, Coincidence Reconstruction

GENERAL RECONSTRUCTION (TOMO RECONSTRUCTION ACTIVITY):

- Process up to 5 series simultaneously
- Multi-Isotope support (6 per series)
- Standard Tomography and Dynamic Tomography reconstructions
- Separate reconstruction parameters per series / isotope

QUALITY CONTROL FEATURES:

- Sinogram, Linogram, and Summed Image
- Cine with reference line
- Automatic and Manual Motion Correction
- Static X / Y / Copy / Paste
- Dynamic X / Y / Copy / Paste
- Gated Histogram Review
- Image Fusion

ORGAN BASED PROCESSING:

- Cardiac Planar Gated Blood Pool
- Shunt Analysis
- Lung Analysis
- Thyroid Analysis
- Renal Analysis
- Gastric Emptying Analysis
- Hepatobiliary
- Brain Analysis
- Image Manipulation

OTHER ACCESSORIES:

- Imported UPS for complete system with 10 minutes battery backup at full load.

- Dry laser camera
- High resolution color printer for SPECT
- Set of quality phantoms (4 quadrant phantom; SPECT phantom)
- 10 mCi rectangular source

HOT LAB ITEMS:
As per IO Specify

Certification:
FDA / CE

Clinical Specialty	**Oncology**
Generic Name	**DOSIMETER BEAM SCANNING SYSTEM**
Clinical Purpose	Dosimeter serves important functions in radiation processing where large absorbed doses and does rate from photon and electrons sources measured with great accuracy.

Technical specifications

Water Phantom:

- Volume minimum: 450 x 450 x 400 mm or more.
- Better to add: Scanning range: 500 mm (horiz.) x 500 mm (horiz.) x 415 mm (vert.)
- Wall thickness**:** At least 12 mm or more
- All in one system, the water reservoir must be integrated in water phantom system
- Phantom should include Electromechanically lifting carriage with adjustment provision, water reservoir (mini.175L or more water) and pump.
- Phantom shall have provision to hold 0.6 cc Former type chamber.
- Wireless operation and data transfer System
- Using smart phone as control pendant
- Automatic water surface leveling system (Auto leveling)
- Auto field alignment
- TPR measurement tools must be included
- Integrated evaporation control to compensate the water level
- inclined bottom for complete draining
- Ample wheelbase to grant no extra weight on LINAC turntable
- Advanced stainless steel worm drive with wave prevention

Electrometer:

- Dual channel for relative dosimetry with variable power supply
- Resolution: 10 fA
- Chamber voltage: (0 ... ± 400) V, programmable in 1 V increments

Chamber:

- 0.6 / 0.65 cc scanning chambers with water proof sleeves with valid calibration certificate.
- Chamber extension cable should be minimum 100 ft. or more.

High Precision Reference Class Electrometer:

- Portable single / dual channel Electrometer for measurement of absorbed dose.
- Reference class electrometers fully compliant with:
- Radiation therapy according to IEC 60731
- Diagnostic radiology according to IEC 61674
- Brachytherapy according to IEC 62467-1
- Touch screen display
- Connectivity: LAN, TCP/IP, WLAN Access
- To be able to measure very low range (Current 0.1 fA)

Solid Water Equivalent Phantom:

- It is made up of slabs of different thickness. This phantom should be used for electron and photon dosimetry. It should be free of contamination and air buffers.

Complete Detector Array System:

- 2D array (For IMRT Plan verification) system for QC of dynamic MLCs.
- The ion chamber technology with min 1400 ion chambers
- To cover the field size up to 27 cm x 27 cm
- Must be able to do the plan verifications for the Non-coplanar, Off Axis and multiple energy plans
- It must have the merge function to eb able to verify the large fields up to 48cm

Laptop:

- Min. Core-i5 or more, 1 Gb graphic card, 4 Gb RAM and 500 Gb SSD with installed software for radiation dosimetry according to international dosimetry protocols

Software:

- It should support TG51 and TRS398 protocols. It should be provided to convert measured data in the format required for beam data configuration of supplied TPS (Eclipse). Software should be able to output data in worksheet format.

Documents:

- User manuals for electrometer, phantom, service manuals.

Note:

- Construction of Bunker 600sq.ft for its Installation and commissioning with Shielding will be the responsibility of the firm, as per satisfaction of the end-user.

Certification:
FDA / CE

Clinical Specialty	Oncology
Generic Name	**PET-CT Scan**
Clinical Purpose	Positron emission tomography (PET) scans detect early signs of cancer, heart disease and brain disorders. An injectable radioactive tracer detects diseased cells. A combination PET-CT scan produces CT and fusion images for a more accurate diagnosis. PET-CT scans also use to stage a cancer or to assess whether treatment is working. PET-CT Scan also to be used to determine whether a suspicious-looking area is scar tissue or active cancer.

TECHNICAL SPECIFICATIONS

- **All specification must comply with NEMA Standards and as per PNRA Requirements**

CT MODULE

SCAN PARAMETERS:

- Gantry Aperture: 70cm or more
- True acquired Scan Field of View 50 cm or more
- Scan Field of View for Peads 24 cm (if separate not mentioned in data sheet, then adult range is acceptable as 24cm is also lies in between 5cm-50cm range)
- Scan Field of View for Adults Range 5cm to 50cm
- Minimum Slice Thickness: 0.625mm or less
- CT Scan Time: 0.3 sec to 0.5 sec
- Number of Slices Minimum 32 and more slices per gantry
- CT Image Reconstruction Time: 10 images / second minimum with iterative dose reduction or ≤ 22fps
- Spiral CT System should be capable of performing helical CT Scan. Function for continuously varying the X-Ray tube current to ensure the optimal X-Ray dose during helical scanning should be available in the system.
- Dedicated Metal artifact suppression software IMAR/SEMAR/SMART or equivalent and latest version should be provided.

CT- IMAGE QUALITY

- Low Contrast detectability of 5mm at 0.3% or better
- High Contrast detectability of 0.31mm in all three axis
- Spatial Resolution of 17.4lp/cm at cut off
-

X-RAY GENERATOR & TUBE:

- Output Power: 70KW or more
- KV Range: Selectable KV Range from 70/80KV to 135KV
- mA Range: 10mA to 600mA
- Tube Heat Storage Capacity: 7MHU or more
- Tube Cooling Rate: 1000 KHU/min or more

X-RAY DETECTION:

- Type: Solid state detectors

- Number of elements: 23500 or more
- CT detector material: Must be latest from manufacturer and should be same as used in top of the line model.

PET MODULE

SCAN PARAMETERS:

- Gantry Aperture 70cm minimum
- Scan Region: Whole body
- Scan System: PET- 3D PET Acquisition with sequential CT acquisition for attenuation correction.
- Scan Plane Programming: More than 360 degree different sequences should be pre-programmed.
- PET Scan acquisition/FOV: 150 mm or more
- PET Acquisition Spatial Resolution: 5mm or less
- Continuous Scan Time: Max. 100sec
- Iterative dose reduction hardware and software to be provided
- PET system timing resolution: 565 psec or less.

PET ACQUISITION 3D Time of Flight (TOF):

- 3D modes must include Static, Whole body, Dynamic and Gated Acquisition provisions

1. **WHOLE BODY PET ACQUISITION:**
   - Acquisition Technology: List Mode
   - Patient Movement Method: Step-and-shoot
   - Reconstruction Method: 3D TOF OS-EM

2. **STATIC 3D TOF PET ACQUISITION:**
   - Acquisition Technology: List Mode
   - Reconstruction Method: 3D TOF OS-EM

GAMMA-RAY DETECTOR:

- Type: LSO/LU-type, BGO is not acceptable.
- Axial FOV (Z axis): 150 mm or more
- Transaxial/lognitudional FOV 70 cm or more
- Scatter fraction: 45% or less
- PET (NEMA Sensitivity) 3.6 kcps/MBq or more
- Number of crystal Need to be defined by firm
- Size of crystal (mm) Need to be defined by firm

PATIENT COUCH:

- Type Carbon Fibre
- Patient Load Capacity: 200KG or more
- Scanning Range: 170 cm or more
- Couch-top width: 45cm or more
- Capable for Horizontal & Vertical Movement
- Dual control (from console and gantry) of table movements.

- Variable Bed time to be provided.
- Pediatric pallet, Head Rest, Arm rest, knee leg support are to be provided

CONSOLE COMPUTOR:

SCAN CONSOLE:

- Should be of Latest Technology
- Hard Disk: At least 1 TB or more
- Central Processing Unit: 64-bit CPU
- RAM: 16GB or more

DISPLAY CONSOLE:

- Should be of Latest Technology
- Hard Disk: At least 1 TB or more
- Central Processing Unit: 64-bit CPU
- RAM: 16GB or more

DATA STORAGE:

- Image Data: 200,000 images or more

DISPLAY:

- Display Monitor: 19-inchs or more color LCD
- Monitor Matrix: 2048 x1152 or more
- DVD: 9.4GB or better

IMAGE TRANSFER:

- 1000BASE-T, 100BASE-TX, 10BASE-T
- DICOM storage SCU
- TIFF conversion

WORKSTATION FOR PET-CT PROCESSING:

- High Speed CPU (3 GHz or better)
- Core i7 or more with latest generation
- 16GB RAM or More
- 2TB Hard disk or More (Memory of the workstation should be independent of the console)
- Minimum 4 GB Graphic Card, dual DVI
- 2048 x1152 or more
- Control
    - Wireless Mouse: 2-button + wheel
    - Wireless US or UK based Keyboard
- Operating System: Windows, Latest (64bit)
- CD/DVD writer
- Wi-Fi laser jet Color Printer (DICOM Compliant)
- Wi-Fi laser jet Black and White Printer (DICOM Compliant)

APPLICATION SOFTWARES (UPGRADABLE FOR FIVE YEARS WITH ALL LICENSES):

System must be equipped with CT studies for comprehensive

- Oncology
- Cardiac
- Respiratory
- Abdominal
- Neuro-Studies including brain perfusion, general vascular
- Whole body imaging with optimal radiation dose efficiency.
- All relevant image evaluation; post processing; reconstruction software and tools.
- Latest Version of DICOM facilities for clinical applications, latest reconstruction software
- Life time licensed latest available of software's.

DATA COLLECTION SOFTWARE:

- Reconstruction of images for Co-registration
- Whole body Acquisition
- 3D volume reconstruction with 3D fusion
- Attenuation correction

DATA PROCESSING SOFTWARE:

Provision of Fully integrated processing and Reconstruction software

- Scan program processing
- Slice position display (planned slice, preset slice, and last scanned slice)
- Anatomical scale (display of position, relative to selected zero position)
- Slice position setting
- Enlargement

PET IMAGE PROCESSING:

- CT based attenuation correction
- Volume rendering;
- Model based 3-D scatter correction;
- Iterative reconstruction methods;
- 3-D prospective reconstruction with iterative scatter correction

CT IMAGE PROCESSING:

- ROI setting and processing
- ROI shape: Point, rectangular, polygonal, elliptical, free-form
- ROI processing: Mean value, standard deviation, area, number of pixels, maximum value, minimum value
- ROI display: Multiple ROIs should be displayed on an image.
- ROI control: Size, position, rotation
- Measurement of distance and angle between two points
- Profile (oblique profile should be available)
- Histogram
- CT number display (for CT)
- Mark display (grid display, scale display)
- Volume calculation
- Enlargement, reduction, panning

- Addition/subtraction between images
- Band display (non-linear windowing)
- Comment and arrow insertion
- Top/bottom, right/left, black/white reversal of image
- Image filtering
- Image rotation (arbitrary rotation)
- SUV display (for PET)

PET/CT IMAGE PROCESSING:

Display modes:

- CT images, PET images, simultaneous display of a fusion image

Display condition settings:

- CT images, slice positions of CT, PET, and fusion images, window conditions of CT and PET images separately set (for fusion image display), grayscale display (positive/negative) of CT images (for fusion image display), grayscale display (positive/negative) and color scale display of PET images used for fusion image display, color table for CT and PET separately should be provided (Rainbow or Hot metal should be selected/edited), ratio of fusion display (transparency ratio of PET images)

Image processing:

- Magnification, panning, rotation of CT, PET, and fusion images

Basic tools:

- Display of pixel values for magnification, panning, rotation of CT, PET, and fusion images
- Point source function image reconstruction with correction to be provided.
- ROI settings and ROI statistical calculation (including SUV measurement)

FUSION SOFTWARE with following features:

- 3D Contouring Tools with export to TPS, which can be used for adaptive RT.
- Vendor neutral support for CT, MR, PET/CT, SPECT/CT, NM.
- Support for 4D (gated) multiple time point data
- Support for multi-sequence
- Support for multi-phase, multi-time point CT
- Rigid image registration
- CT deformable image registration for longitudinal region tracking
- Modality-specific deformable image registration
- Deformable assessment and quantification tools
- Motion correction for hybrid scans
- Initial with unlimited follow-up multi-modality scan comparison
- Fusion of single phase CT or single sequence MR to CT, MR, PET/CT, or SPECT/CT
- Deformable fusion of single CT or MR to CT, MR, PET/CT or SPECT/CT
- Deformable fusion of multi-phase CT or multi-sequence MR to CT, MR, PET/CT or SPECT/CT
- Software PET/CT
- Single click region tracking

- Advanced PET/CT review modes such as “Head and Neck” and “Melanoma” and whole body
- Nuclear Medicine review with integrated planar and SPECT/CT
- Quantify SUV, volume, linear and bi-directional measurements
- Support for SUV max, mean, peak, min, median, std. dev., volume by weight, LBM, and BSA
- CT segmentation tools for CT volumetric and RECIST evaluation
- Support for standard response assessment protocols RECIST 1.0/1.1, PERCIST, etc.
- User-defined image layouts with multi-monitor support

QUALITY CONTROL SOFTWARE:

- For Scanner calibration (for all scanner performance parameters)

SYSTEM MANAGEMENT SOFTWARE:

- Warm-up function
- Calibration data acquisition
- Patient data input
- Patient appointment function
- Examination summary
- Exam Plan editing
- Modification of related information
- Operation environment settings
- Slice counter

DOSE MANAGEMENT:

- CTDIvol (or CTDIw) /DLP/Geometric eff.
- Dose check (NEMA XR-25)
- DICOM SC Exposure summary
- DICOM SR compliant Dose report

CLINICAL APPLICATIONS FOR CT:

- 3D color image processing
- Automatic MPR (MultiView)
- Clinical applications for PET
- PET/CT Fused 3D Display
- PET/CT Fused MPR display (cine)

PATIENT COMMUNICATION SYSTEM

- Integrated Intercom for two-way communication b/w gantry and console area, Automated Patient Instruction System (API), CCTV should be provided.

PACS INTERFACING: System must be PACS interface ready without any new hardware or software.

PHANTOMS: All phantoms required for periodic QA test of PET-CT.

INJECTOR:

- Dual head programmable Power injector with flow/volume and temp control capable of simultaneous injection of both contrast and saline. Mounted on mobile base with 100 syringes of 150 ml capacity and connecting tubes

UPS:

- On line sine wave UPS for whole system with a minimum back up of 10 minutes.

4D RESPIRATORY GATING TO BE PROVIDED FOR PET AND CT(4D Respiratory gating for CT is only needed If simulation workstation is included).

HOT LAB ITEMS.

1- Dose calibrator (latest model will be provided)
2- Position shield for calibrator
3- Auxiliary shield for calibrator
4- PET 3cc syringe shield. (Qty. 2/As per end user requirement)
5- PET 5cc syringe shield. (Qty. 2/ As per end user requirement)
6- PET sharps container shield
7- PET sharps container
8- High energy PET L block
9- Interlocking lead brick cave
10- Syringe carrier
11- Forceps.
12- Lead lined waste container
13- Co-57 reference source for dose calibration
14- Cs-137 reference source for dose calibration
15- Contoured leg rest
16- Check source for survey meter
17- Check source holder for survey meter
18- PET mobile shield
19- Minor emergency spill kit
20- Staff personal safety dosimeter (12 nos.) or as per need of hospital/procuring agency
21- Survey Meter Cone model Surveyor 2000 or similar (1No.)

- Alpha, beta, gamma & X-Ray detection
- Single 9-volt battery
- Exclusive HV Check
- Choice of GM probes
- Variable response time
- Anti-Saturation circuit
- Dead time compensation
- Built-in audio
- Up-to 2000mR/h

CIVIL WORK:

- Room modification, civil work, electrical work, HVAC/Split AC, Lead Lining on wall/doors as per PNRA requirements.

DOCUMENTS:

- All the Application, Operation and Service Manual (Hard and soft copy) in English Language.

<u>OPTIONAL ITEMS</u> (Need to be identified by procuring agency/end user as per requirement)

1-Lead apron
2-Infant positioners
3-Head holder (Brain PET)
4-Decontamination kit
5-ECG gating Device

6-Workstation for CT Simulation:

- CT Simulator Workstation having following Software and 24" Wide screen HD Monitor.
- 3D CT Virtual Simulation software for advanced image manipulation, drawing tools and viewing radiation field placement and iso-center definition. The choice of beam placement by using a Beam's-Eye-View (BEV) display and DRR to be provided.
- The treatment unit and patient anatomy should be visualized in 3D from any point in the treatment room. 2D and 3D image processing tools to enable pan, zoom, window/level.
- Rapid auto contouring technique.
- Virtual Simulation and DICOM 3.0 Image Processing.
- Treatment Field design and Visualization to be provided.
- The system should be capable to do image registration of multimodality images.
- Hardware Specification should be mentioned clearly.
- The system should be running on a high-end workstation platform of reputed brand with at least 8 GB RAM or more. Minimum 64 bits processor with minimum of 250GB hard disk or more.
- The user interface should be windows based.
- The latest archiving media should be provided. Provide details.
- Networking with TPS: All the software with licenses required should be included. Complete DICOM-RT export/import license should be available.
- It should be possible to take printouts on DICOM printer from any of the CT simulation workstation.
- FLAT COUCH-TOP

<u>7-Laser System With Simulator.:</u>

Complete red laser system for virtual simulation consisting of two fixed crosshair lasers with a fixed tansversal line and a movable sagittal line at the ceiling. the control of the lasers should be provided through software for patient marking and virtual simulation on a ceiling suspended/hanged touch screen tablet.

Clinical Specialty	Oncology
Generic Name	**Medium Energy (Conventional) Cyclotron**
Clinical Purpose	It is an electrically powered machine which produces a beam of charged particles that can be used for medical, industrial and research processes. As the name suggests, a cyclotron accelerates charged particles in a spiral path, which allows for a much longer acceleration path than a straight line accelerator. This cyclotron produce minimum 10 Curie in one cycle radioisotopes for use in PET Scan with short radioactive life onsite, which then become radiopharmaceuticals for direct use by patients.

TECHNICAL SPECIFICATIONS

Particle Acceleration and Beam Extraction Requirements:

- Medium Energy cyclotron with minimum 16 MeV energy dual beam current 100µA and more- able to produce 10Ci of F18 in one cycle of 2 hours.
- All sub-systems: magnet system, RF system, vacuum system, control system (PLC, monitors, software) all power supplies, primary cooling system must be included
- Dual beam (dual irradiation) mode
- The cyclotron should be equipped with two proton /one proton and one deuteron sources
- The cyclotron should operate in dual beam mode, simultaneous beam extraction on two opposite exit ports.
- The system should be non---shielded (16MeV and above) and capable to produce positron emitting isotopes of 18F as standard and other optional isotopes like 13N, 11C, 68Ga, 89Zr, 64Cu and Tc-99.
- The Cyclotron must has a real-time target safety system that continuously monitors the pressure inside the target and compares it a theoretical curve. If an abnormal pressure is detected, an alarm is generated and the ion source current is kept in safe mode.
- The cyclotron and targets should be completely automated through a highly reliable industrial Programmable Logic Controller or Microcontroller with dual screen User Interface provides all data and feedback to the User.
- The Cyclotron must have remote access allows supervision of the cyclotron or diagnostic, from any location where internet is available using secured access (VPN) over ADSL line.

Vacuum / Power Consumption /Personnel safety / Decommissioning Vacuum:

- The vacuum system must be highly reliable and simple to maintain.
- The time required to establish the vacuum must not exceed 30 minutes.
- The Cyclotron Should have ECO-mode for the vacuum standby that reduces the electrical load even lower while keeping cyclotron under vacuum

Power Supply:

- The cyclotron should be low power requirements ≤ 75 kW

Radiation Safety:

- Sufficient radiation shielding shall be incorporated in the vault design to ensure that the integrated equivalent dose (total gamma and neutron dose) limits detailed below in areas adjacent to the Cyclotron room shall be met International Standard
- Provides an assessment of radiation safety, based on a computer-simulated evaluation of the radiation levels in and around an operational cyclotron around the vault
- Magnetic Field Cartography (ISOGAUSS curves) is given so as to plan the cyclotron location.

Personal Safety:

- Equipment design concept shall be such personnel from leakage or from induced radioactivity (if any) in system components and accessories are minimized and under no circumstances exceed the relevant dose equivalent limits outlined by the **Basic Safety Standards IAEA**
- Procuring agency must describe their design and tools in order to demonstrate in which way it reduces personnel exposure.

Decommissioning:

- The procuring agency must detail how its cyclotron design will reduce the neutron activation of the vault and what are its recommendations for the vault design. How the vault will be decommissioned and who will take responsibility? (Quote separately)

Cyclotron Control system:

- Suitable computers shall be supplied for computer controlled operation of the cyclotron. Any additional computers or work stations and software required for full maintenance of the cyclotron and for problem diagnosis of both the cyclotron shall be provided.

General Requirements. for Control Computers:

- The cyclotron control computer shall allow fully automated operation of the cyclotron,
- including but not limited to,
- Loading of target with target material
- Selection of target to be irradiated
- Selection of particle type and beam current
- Irradiation of target
- Transfer of radioisotope to the selected delivery point

- Automatically optimize and tune cyclotron operational parameters
- Monitor, display and record cyclotron operational parameters and provide alerts when abnormal conditions are detected
- Routine operation of the cyclotron shall not require the operator to enter the cyclotron room to manually operate valves, fill traps and targets, purge or prime systems, view system operation status etc
- It should be possible to fully control the cyclotron operation from multiple computer workstations, installed at different locations and interlinked to the cyclotron via standard Ethernet cabling (Cat 5 - UTP) or through software. Details of the function offered shall be provided
- Interlocking between cyclotron control computers should be provided to ensure that only one of the control computers has control of cyclotron operation at any given time. Once one of the control computers has taken control of the cyclotron operation, other control computers should be locked out from controlling any of the cyclotron's operation until control is relinquished by the controlling computer.
- Full cyclotron operational information should be displayable on any of workstations, including those not controlling the cyclotron at the time. Details of the function offered shall be provided
- The computer workstations should provide a simple and automated scheme to display, record, archive, recall and graph cyclotron operational parameters. Details of the function offered shall be provided

Cyclotron Targets:
Requirements:

- F18-water target - Niobium insert - for reaction 18(p,n) 18F for production of fluoride-18: capable of producing minimum 10 Ci in 2hr of irradiation. Including window assembly, valves, controls, water cooling and electrical isolation; pressure transducer; vacuum isolating gate valve; quick disconnect.
- Complete system to flush target and lines including switching
- Number of target ports must 6 0r more
- Conical Shape target with minimal consumption of O-18 water, Must be mention consumption of O-18 Water
- Simultaneous 02 extracted beams
- Each beam exit port must be equipped with one extraction system.
- Target must be Niobium Body or Tantalum
- Target Switching box should be included
- Each extraction system must have at least two stripper
- Time required to remove entrance foil from target body during maintenance of target.

Target Line switching:

- It shall be possible to select the different delivery points using suitable valves under the control of the cyclotron control computer.

[F18] F Switching module:

- The irradiated material from all the [F18]F-targets mounted on the cyclotron shall

be able to be transferred to the hot cells designated for synthesis using [F18]F

-

CHEMISTRY MODULE :

SYNTHESIS UNITS FOR PET PRODUCTION LABORATORY

General Requirements:

Fully automated synthesizer with auto-electable system- Radiation, temperature, gas & compressed air sensors

Heating system up to 100 degree or more

Full automated synthesis module for FDG,(NaF, FCH are optional), peptide labeling. Up to 2 modules can be installed in one hot cell. Capable to do at least 4 runs in a day

Microsoft® Windows-based

Password protected three-level access software- Protected electronic records, print integrity and full audit trail

Built-in material batch number tracking system

PLC-based & Ethernet communication

Adjustable parameters- Automatic data-logging

Should have in-built detectors with computer readout display to allow the operator to monitor the radioactivity in the synthesis unit and follow the progress of the synthesis.

Data from the in-built detectors shall be able to be logged by the computer.

Details of the log file format shall be provided.

FDG at end---of---synthesis (EOS) shall be no less than 55%. and must be part of the tests for modules acceptance:

The total time of FDG synthesis shall be < = 30 min

Each FDG Synthesis Unit shall be capable of multiple runs in one day.

HOT CELL: EQUIPMENT FOR PET PRODUCTION LABORATORY

General Requirements

- The hot cells shall meet the following requirements: One Single Production Hot Cell made of min 75 mm or more lead shielding with viewing Lead Glass and host at least 2 chemistry module and waste compartment to collect cassettes.
- Hot cell and Waste Compartment must contain GM probe for continuous radiation monitoring

Requirement of Dispensing system for FDG from the FDG Synthesis Unit:

- One hot cell made of 90mm/75mm or as per regulatory requirements lead shielding (stainless steel finishing) with Laminar Flow Class A.
- One hot cell for long lived radioisotopes as per regulatory requirements lead shielding (stainless steel finishing) with Laminar Flow Class A.
- Automatic dispenser for vials

Quality Control Equipment for FDG:

- Quality Control Equipment for F-18, labeled & other mentioned radionuclides must be selected in order to allow performing tests according to the US/Europe Pharmacopoeia.

Civil Work:

- Construction of Bunker must be as per manufacturer design and as per requirements of PNRA following the WHO safety Standards.

Clinical Specialty	Oncology
Generic Name	DUAL ENERGY LINEAR ACCELERATOR
Clinical Purpose	**Dual Energy Linear Accelerator** (LINAC,) is a machine that is commonly used to deliver external beam radiation treatments to cancer patients. In this way the LINAC with dual beam can target and destroy cancerous cells in a precise area of a patient's body with minimum treatment time and minimal exposure to the surrounding healthy tissue. Dual Energy LINAC has many applications: they generate high energy electrons and positron for medical purposes in radiation therapy, and are used directly to achieve the highest kinetic energy for light particles (electrons and photons) for treatment of different types of cancers which are not possible with single energy LINAC

TECHNICAL SPECIFICATIONS

Main physical parameters of LINAC system

- The accelerator shall be capable of producing at least two clinically useful photon beams Including energies of 6 MV and 15 MV
- *Optional Beams: 10MV, 6MV FFF, 10MV FFF*
- The target to axis distance should be 100 ±0.2 cm.
- The iso-centre shall lie within a sphere of radius 1 mm or should fulfill IEC or AAPM and Global safety requirements.
- The accelerator gantry shall be capable of rotation of 360 degrees (±180 degree) with a variation of the mechanical and radiation iso-centre during rotation of less than ±1.0 mm throughout the entire rotation with variable gantry speed.
- Digital scales indicating gantry angle position shall be provided both in the treatment room And the control console. Accuracy of the scales shall be ± 0.5 degree.
- The distance from the end of the lower collimator to the isocentre shall be > 41 cm.
- The bottom of the blocking tray should be greater than 30 cm from isocenter
- Digital scales indicating collimator angle position shall be provided both in the treatment room and at the control console. Accuracy the scales shall be ±0.5 degree.
- Isocenter mechanical precision of kV, MV and Treatment isocenters <= 1mm
- In addition to meeting above specifications for radiation leakage, the LINAC should also meet all the mandatory safety and radiation leakage regulations or as specified by IAEA, IEC, NCRP and BSS safety requirements.
- Focal Spot size should be 1-2 MM (smallest is preferable}
- Bi-directional arc therapy should be included with Automatic calculation of Dose per Degree based on the Dose Rate selected and the Arc angle set.

PHOTON BEAM DOSE RATE STABILITY:

- Dose rate range: shall be variable in steps to ≥500 MU/minute for both 6 and 15 MV X-ray energies.
- One “MU" meansonecenti-Gray delivered to a tissue-equivalent material at dmax and 100 cm SSD with a beam of 10 x 10 cm² field size“
- For FFF 6MV beam, dose rate range should be within 400-1400 MU/min
- Arc dose rate range should be at least 5-60 MU/deg in continuous steps.
- LINAC shall have built in dosimetry chambers with two separate / independently powered integrated dose meters. The performance parameters of dosimetry system shall be

as follows:

a. Each beam monitoring system shall be capable of independently monitoring, interrupting, and terminating irradiation.

b. Precision: ±1% or 1MU

c. Linearity: ±1% or 1MU

d. Reproducibility: ±2% or 1MU

e. Inter locks to detect dose rate differences between the two chambers

f. A high dose rate interlock to prevent an excess dose rate

g. An independent back up timer.

PHOTON BEAM ENERGY STABILITY:

- The quality index of a photon beam should not vary with time by more than±1%.
- The bend magnet system shall be provided with energy defining apertures such that the nominal energy of the electrons beam exiting from the bend magnet shall be within ±3% of the nominal energy selected at control console for both photons and electrons.

GANTRY:

- A motorized gantry with iso-centric design with at least following detail of parameters:
- Rotation: ± 180 (360°total)
- Read out: Digital

- Rotational speed: 0-1 RPM
- Control: Hand pendent and control console
- Target to Axis Distance: 100 cm ±2 mm or better
- ODI Range: 75 cm to 156 cm
- ODI Accuracy: ±0.1cm at gantry zero degree
- Gantry, couch and collimator Rotation Iso-centre shift: **≤1** mm diameter

TREATMENT HEAD ASSEMBLY:

Collimator:

- Field size: Continuous variable from 1x1cm² to Max.40x40cm² measured at 100cm SSD
- Asymmetric Collimators; X & Y both Asymmetrical
- Rotation: >± 170°rotation
- Rotational speed : At least 0-2 or more RP Min variable steps
- Control: Hand pendent and control- console
- Readout accuracy: <0.5°
- Coincidence of light field and radiation field: within 2mm or 1% of the field size

Multi-leaf collimator (MLC):

- Maximum Field size: 40 x 40 cm
- No. of MLCs should be 120 or more
- Leaf resolution at iso-center: 5 mm for central field and 10 mm for outer field.
- *Optional: 2.5 mm for central field*
- The dynamic control of MLC should be capable to deliver dose for radiotherapy

techniques including 3D CRT, IMRT, lMAT techniques.

- Maximum Leaf retracting position: 20 cm from central line or better
- Maximum leaf extends position :-20 cm over central line or better.
- Leaf transmission: ≤ 2.5 % or better.
- Leaf Speed: 0 to 2.5 cm / sec or better.
- Coincidence of light and x-ray field: Within 2 mm or 1% of field size
- Penumbra shall be <7 mm for 10 x 10 cm² fields or better
- Treatment room display monitor: at least 19" or more

Wedge:

- A standard set of blocks for 6MV , 10MV and 15MV beam should be supplied.

TREATMENT COUCH:

- 4 Degree of Freedom Couch: A fully automated, digital and integrated treatment couch should be provided for easy patient setups and full support of advanced radiotherapy techniques like IGRT, IMRT and IMAT etc.
- Optional: 6 Degree of Freedom Couch
- Optional: Feature to automatically adjust iso-center at the Time of patient treatment. This variation in the position of iso-center is produced while simulating and planning of patient treatment.
- The couch should also satisfy following physical parameter at least but not limited to this.
- Versatile extended range shall be supplied
- Rotational accuracy:<0.5°
- Spatial translational accuracy: ≤ 1mm.
- Couch weight bearing limit: ≥ 200Kg.
- Movement: should have all types i.e. translational, vertical, lateral and rotational with full electronic control.
- Electrical & Mechanical Control in case of power failure.
- Control-Local and / or Remote
- Indexed table top for advanced radiotherapy treatments

ENERGY BEAMS PERFORMANCE PARAMETERS:

Photon beams:

Field size specifications:

- The field size is defined as the distance along the radial and transverse axes between the points of 50% density on an x-ray film taken at 100 cm SSD with minimum buildup. The display, light field size and high energy X-ray should be accurate to within + 1 mm for field sizes ≤10 x 10 cm2 and ±2 mm or 1% for field sizes > 10x10 cm².
- The accelerator shall provide a continuously variable rectangular, unclipped field size from 1 x 1 cm^2 to 35 x 35 cm^2 at 100 cm SSD. The Maximum clipped field size should be equal or exceed 40 x 40 cm² at 100 cm SSD.
- Radiation Field Penumbra
- The width between the 20% and the 80% iso dose lines measured for 10x10 cm at depth of 10 cm at 100 cm SSD should not be more than 7 mm.
- Congruence between optical & Radiation fields
- The congruence between optical and radiation fields for all photon energies for 5x5cm^2,

10x10 cm2 , 30x30 cm2 or for a field of maximum dimension for 0 deg, 90 deg, 180 deg and 270 deg gantry angles with SSD=100 cm at the depth of reference plane should be ≤ 2mm or 1%

- 7.1.5 Field Symmetry Specification
- The maximum percent difference of average doses shall not exceed ± 2% for the longitudinal and transverse halves of the field at 100 cm SSD and 10 cm depth at gantry angles of 0, 90, 180 and 270 degrees. Field sizes shall be specified as 10x10 and 40x40cm^2.
- (Average dose is defined as the arithmetic average of minimum and maximum doses within the central 80% of the field for both axes).
- X-ray Contamination:
- The X-ray / electron / Neutrons leakage and contaminations should comply the national regulatory guidelines. All safety systems including head leakage should be as per IEC / NCRP/ international safety guidelines:
- The x-ray contamination of the electron beam shall be less than 5% of the maximum dose for all energies specified previously.
- X-ray absorbed dose due to leakage radiation (excluding neutrons) outside useful beam but inside a plane circular area of radius 2m centered around and perpendicular to central axis at normal treatment distance should not exceed 0.2 percent of the absorbed dose rate on the center axis at the treatment distance.
- Radiation leakage limits shall be within appropriate regulatory agency guidelines as follows: Photon leakage: The photon leakage rate at any point one meter from the target outside the cone defined by the primary x-ray collimator shall be less than 0.1% of the absorbed dose at The isocenter.
- Collimator transmission: The movable collimators shall not permit transmission of radiation exceeding 0.5% of the central axis dose at do« measured in air for both photon energies.
- Neutron leakage: The neutron leakage rate should not exceed 0.15% expressed in neutron Dose equivalent (REM) when added to the photon leakage for a 10x10 cm field at the iso- center at any point one meter from the target when the jaws are closed.

Electron Beams:

- Minimum 5 Beam energies between 4-15 MeV or more
- Optional: 6 MeV for High Density Total Skin Electron
- Dose-Rate for electron energy:
- ≥ 500 MU/min for all provided electron energies.

Field Size:

- The electron beam size is defined by the inside dimensions of the electron beam applicators projected geometrically to a plane surface at 100 cm SSD.
- At least 5 applicators preferably with Minimum 6 x 6 cm^2 or less to Maximum 25 x 25 cm² or more.
- It shall be possible to visualize both the field defining light and the optical distance indicator with an electron applicator in place.

Beam Flatness:

- Variation of electron intensity relative to the central axis shall not exceed 5% within the central 80% of radial and transverse axes for photons field sizes 10 x 10 cm to 20 x 20 cm at 10 cm depth and satisfy local regulatory requirements.

  Beam Symmetry
- The maximum percent variation in the average electron intensity to the longitudinal and transverse halves of the electron field at Dmax for a 10x10 cm and 25 x 25 cm field at 100 cm SSD shall not exceed ± 3 % at gantry angles of 0, 90, 180 and 270 degrees.
- The average electron intensity is the average of the maximum and minimum points within the central 80% of the field for each of the axes.

INTEGRATED IMAGING AND GENERAL ACCESSORIES:

Following items need to be provided:

- Front and back pointer — both mechanical and laser
- CCTV / Camera system (at least two nos.) one wide angle & one remote control with remote zoom & focus facility and display monitor in console area
- Laser alignment system — Green / Red color (3 cross + 1 line) for localizing iso-centre in treatment room.
- A patient communication system: from treatment room to console area shall be supplied
- Interface mount to be provided for shadow trays.
- Collision detection system is an emergency stop of the LINAC movement: must be included to prevent the collision of both treatment head with outer accessories and safety of MLCs movement against any object infield
- Survey meter/detection system for showing LINAC beam ON indication & real time dose display at console area.

Portal Imaging, dosimetry & Accessories:

- Portal imaging system along with 2D and 3D portal dosimetry and its data evaluation software should be provided. The system should be fully integrated with LINAC having minimum 40 x 40 cm^2 active detector areas or higher.
- It should be able to take images at any Gantry angles through automatic / motorized movements.
- System should have Digital detector (Amorphous Silicon Flat Panel Based Technology) with resolution 1024 x 1024 pixels or better
- System should be capable to perform MV Imaging

KV Imaging system:

- Preferably KV based 3D IGRT and KV/MV based Portal Imaging shall be provided and such system shall have FDA/CE clearance.
- The System shall have integrated x-ray source with flat panel detector system.
- It shall have full integrated support for generating and developing of 2D radiography, 2D fluoroscopy and 3D cone beam computed tomography (CBCT) images/scans and 4D images. With full DICOM compatibility.
- Provision of FDA approved QA tools kit having essential software with database for performing and analyzing routine quality control of KV/MV, IGRT and other related system components.
- KV range of generator: 70-140kV

- mAs range: ≥500mAs
- kV Imaging arms should have sag correction

Optional: Respiratory Gating:

- This system integrated with LINAC can be used for motion control during treatment or any system to incorporate the in-line IGRT technique, needs to be provided with full details. Gating option should be available on LINAC and CT SIM side (if available at hospital)

ONCOLOGY INFORMATION SYSTEM COMPLETE WITH NETWORKING (IS):

- A full FDA approved package having at least following features:
- Record & Verify System; a complete data base for radiotherapy patients with storage capacity of 10K patients having 05 workstations with complete software / licenses.
- Fully integrated server based solution with data residing on the same database as treatment planning to minimize transfer time and errors
- Transfer of images from available CT Simulator / scanner, MRI, through DICOM
- Transfer of all parameters of Treatment Planning System to the linear accelerator for Automatic treatment setup & delivery.
- Transfer of images from CT Simulator/TPS to Portal Imaging System for comparison.
- Efficiently Transfer & Execution of MLC Position Parameters for normal treatment & including step & shoot and Sliding Window (Dynamic) and ques from Treatment Planning System to treatment machine.

TREATMENT PLANNING SYSTEM:

- Provide a latest comprehensive Radiotherapy Treatment Planning (RTP) system for conventional, 3D Conformal Radiotherapy, Inverse Planned IMRT and VMAT.
- The planning system shall have 2 calculation engines with planning capability / life time license for photon beams of conventional, wedged, 3DCRT, IMRT and IMAT also including multiple electron beams for both conventional/arc techniques. Both systems should have the same capabilities to perform above calculations.
- There shall be 2 separate (work stations) contouring systems with the licenses having ability to do contouring. These systems should also be capable to communicate for DICOM coordinate transfer.
- The TPS software shall run on a powerful and efficient computer system with adequate, latest FDA approved specifications.
- Optional: GPU Based workstations
- TPS data should be stored on a unified database with the oncology information system to minimize chances of data corruption during transfer and for faster data transfer
- Integration (full Networking for import and export of data) for conventional/Digital Simulator, CT scanner, CT Simulator and MRI should be done via Planning Systems

Optional Planing Software Module:

- Multi Character Optimization Tool: Optimization tool that allows in real time, the

trade off exploration and visual evaluation of patient dosimetry, varying the coverage criteria of target volumes and OAR sparing using multiple cost functions based on Pareto surface

- Auto-Segmentation: Knowledge base contouring tool based on a patient database that allows to automatically create the patient contours
- Optional: Intra-cranial Non-coplanar treatments: Module to plan and treat patients using SRS with non-coplanar treatments for multiple metastases in an efficient workflow. Should have the ability to define treatment and imaging way points and delivery all treatment and imaging requirements.

Beam Placement & Definition:

- It should support extensive beam shapers (shielding blocks, etc.) and beam definition methods manual or automatic beam placement tool.
- Tools for real time checking of machine geometry
- Beam shaping should be possible in multiple ways like automatic shielding block definition conforming to selected volume, definition as aperture or shielding, manual freehand definition, automatic collimator jaw or multi leaf position definition etc.

DDR Features:

- Interactive DRR calculation mode must be available Automatic window width/ level selection for DRR.
- DRR should be interactively updated when the isocentre position is modified should be possible to highlight or suppress different density regions in the DRR printing of DRR images should be possible.
- Specify DRR image enhancement to improve DRR image quality. Reconstruction of DRRs should be real-time or sub-second direct printing of DRR on laser film should be `possible.
- Real-time displays of DRR as beam parameters are changed.
- It should be possible to transfer DRR and BEV images to EPID of Linear Accelerator.
- Cross-hair display on DRR to provide scale information

Iso-centre management:

- The software should support separate iso-centre for multiple target volumes or general regions. Marked and final iso-centre should be reported and displayed in the Localization package for easy confirmation of a physical simulation session.
- No limit on number of iso-centre per target.
- Hardcopy of the iso-centre coordinates should be possible for record of the simulation session.

Dose Calculation:

- At least two different calculation Algorithms should be provided for Dose module including Collapsed Cone Convolution super position/ AAA convolution/ Acuros XB for photon beam dose calculation. The quoted algorithm should provide results equivalent to gold standard calculations.
- It should be possible to define the absolute dose to a specified point for each beam or MUs or time (isotope base machines). Normalization of dose distributions to minimum,

maximum, an'/ arbitrary % *value* or to any dose point value.

- Possible to define wedge fraction for motorized wedge plans.
- Should have provision of in-homogeneity and bolus correction
- Should include various Dose Volume Histogram tools like
- Cumulative and differential histograms
- Comparison of requested Dose Volume Constraints versus achieved Dose Volume Histogram results
- Volumes may be displayed in absolute or relative terms
- Should including Monte-Carlo based dose calculation for Electrons module with possibility to have Calculation of electron beams of 4-15MeV or more from linear accelerators and Support for square, circular, and rectangular as well as irregular shape applicators.
-

Plan Output:

- The plans can be exported directly after approval to linear accelerator for dose delivery.
- User definable print layouts
- On screen graphics can be dumped to a color graphics printer
- Plotting of plan in a user selected scale on A3, A4, letter or tabloid size paper
- Print outs include patient administration data, time stamp, field parameters (treatment unit, gantry, collimator and couch rotations, field position coordinates, field size, wedge, weight, Monitor Units), dose parameters (target maximum, minimum and mean, maximum dose), patient orientation and plotting scale
- DRR printed with cross-hairs to identify isocenter
- DRR printed with graticules to identity scale
- DRR printed with structure out line protections
- Scale-able DRR print outs
- Plotting of BEV image at any distance.
- Block outlines can be plotted in a user defined scale with internal structures and field edges
- Compensator shapes as equivalent thickness curves or profiles can be plotted at user defined scale
- a Plotting of compensators as iso thickness curves or thickness profiles at any distance.
- Direct data transfer to compensator milling machines.

DICOM RT Data import/ Export:

- System should be able to import and export Image, and volume in DICOM 3.0 standard along with all Radiotherapy specific image data. Offered Software modules should be compatible to perform as below:
- Export of ideal or reconstructed Fluence distributions and Fluence maps in DICOM RT format
- DICOM RT plan export to various R&V and QA systems including (but not limited to) Oncology Information System connectivity
- DICOM should be of latest version and should be compatible with the related existing facilities in the Institute.

Standard Beam Data Set:

- Standard Beam Data should be provided in hard copy and soft copy with compatible file formats.

DAILY PERFORMANCE AND MAINTENANCE CHECKS:

- Module for routine machine testing and maintenance checks should be included with an efficient workflow integrated into the linear accelerator. This QA should be done automatically.
- *Optional: Module for Individual Patient Plan QA*
- *Optional: Module for QA of each fraction against plan*

IMMOBILIZATION DEVICES:

Breast Immobilisation:

- Carbon Fibre Breast board with an elevation system complete ***or equivalent***
- Bi-Axial Arm Support , MT-TAS-R/L.
- Wrist support, MT-TWS-S .
- Hip stop
- Round head cup

Head and Neck Immobilisation:

- Head and Neck immobilisation designed for routine head and shoulder immobilization as an add-on system ***or equivalent***
- Baseplate for head and neck treatment in supine and prone position
- Patient comfort pillows
- Prone Pillows for Prone treatments
- Thermoplastics Masks IMRT Reinforced Head only
- Thermoplastics Masks IMRT Reinforced Head, neck and shoulder

Pelvis Immobolisation:

- Foam Belly board system for patient-friendly non invasive positioning ***or equivalent***.
- Base plate for treatment in prone position
- Small insert
- Medium insert
- Large insert

ALLIED EQUIPMENT/ACCESSORIES:

- UPS: High quality online UPS compatible with the LINAC. No local or Chinese UPS would be accepted.
- Chiller: Cooling system as per LINAC requirements

CIVIL WORK:

- Construction of bunker must be as per manufacturer design and as per requirements of PNRA following the WHO/International safety Standards.

Clinical Specialty	Oncology
Generic Name	**SINGLE ENERGY LINEAR ACCELERATOR**
Clinical Purpose	**Single Energy Linear accelerator** (LINAC) is a **machine** that is commonly used to deliver external beam radiation treatments to cancer patients. In this way the **LINAC** with single energy can target and destroy cancerous cells in a precise area of a patient's body with minimal exposure to the

TECHNICAL SPECIFICATIONS

GENERAL REQUIREMENTS FOR LINEAR ACCELERATOR:

General requirements, other performance and safety parameter of the linear accelerator must fulfil the requirements of the international standards (IEC 61217, 60976 and 60601-1-2-1)

- Waveguide: Travelling/Standing wave
- System must be provided with Water Chiller, UPS and Motorized sliding Radiation door

RADIATION TREATMENT BEAMS:

Photon Beams (Conventional flattened beams)

- Single photon beam energy: 6MV,
- Photon Beam Dose rate up to 500 MU/min or better
- Photon field sizes range continuously variable from ≦ (1 x 1) cm to (25 x 25) cm (or more) in the plane containing the isocenter.
- Photon beams should fulfil the recommendation of the international standards IEC 976/977 regarding radiation field uniformity and stability

MECHANICAL RANGES AND POSITIONS INDICATORS:

- Gantry Rotation Range **not less than** 360° (±180°)
- Gantry Rotation speed range from 0 to 6°/sec (1 RPM)
- Collimator rotation speed range from 0 to 12°/sec (2RPM or more)
- Accuracy of angle indicators ≦ 0.5°
- Distance Source to isocenter 100 cm
- Distance from Radiation Head to isocenter **not less than** 45 cm
- Isocenter height over the floor **not higher than** 125 cm
- Deviation of the radiation beam axis (radiation isocenter) with rotation of the collimator and gantry (as defined in IEC 976/977) **not more than** 1mm radius
- Deviation of the table isocenter rotation axis from the radiation isocenter (as defined in IEC 976/977) **not more than** 1 mm radius
- Room laser 3D system for indication of isocenter coordinate system
- Light field indicator of the position of the radiation field
- Coincidence of radiation field edge with light field edge: **not more than** 1 mm for field sizes up to 20cm x 20cm, **not more than** 1% for larger field sizes
- Optical distance meter which indicates the distance from radiation source to patient surface on the central axis in range: 75 to 170 cm, resolution **not more than** 5 mm
- The accelerator should be fitted with a guard system that protects against a collision between the radiation head and the patient on the table or any other object. If activated it should stop and inhibit any movements of the gantry, head and table

LINAC DOSIMETRY SYSTEM:

- Integrated Dose Monitors System
- Two independent Ionization chambers (according to IEC 60601-2-1)
- Linearity / Proportionality **not more than** 1%
- Repeatability / Reproducibility better than 0.5%
- Stability / dependence on angle **not more than** 1% for any gantry and radiation head angle

FINE RESOLUTION DYNAMIC MULTIFUNCTIONAL MLC FOR RT, SBRT AND SRS:

- Maximum Field Size - 25 cm x 25 cm (or more)
- Minimum Field Size - ≦(1 x 1) cm
- Number of leaves – **no less than** 120 or Dual Layered MLC
- Leave width projection at isocenter – 5 mm for all leaves and over the whole field area
- Maximum distance between leaves on same leaf guide **not less than** 20 cm
- Leaves inter-digitation capable
- Leaves Maximum retracted position **not less than** 14 cm from field center line
- Leaves Maximum extended position **not less than** 14 cm over field center line (over travel)
- Maximum Leaf speed **not less than** 3.5 cm/sec
- Dynamic diaphragms/jaws moving orthogonal to leaf travel direction.
- Dynamic Field defining diaphragm Maximum retracted position **not less than** 20 cm
- Dynamic Field defining diaphragm Maximum over-travel distance **not less than** 10 cm
- Field edge penumbra **not more than** 6 mm
- Average transmission through the leaves **not more than** 0.5% (according to transmission definition in IEC 60601-2-1)
- Peak leakage between leaves **not more than** 0.5% (according to definition in IEC 60601-2-1)
- Leaf position accuracy **not more than** 1 mm (≦0.5 RMS)
- Leaf position repeatability **not more than** 0.5 mm
- Leaf position resolution **not more than** 0.1 mm

RADIATION TREATMENT DELIVERY MODES:

- Conformal Radiation Therapy (CRT) with MLC
- Conformal Radiation Therapy (CRT) with MLC and integrated wedge
- Step & Shoot Intensity Modulated Radiation Therapy (S&S IMRT)
- Dynamic Intensity Modulated Radiation Therapy (Dynamic IMRT)
- Automatic sequencing of the treatment beams during CRT and IMRT
- Standard Arc Radiation Therapy
- Dynamic Arc Therapy
- Volumetric Modulated Arc Therapy
- Automatic Integrated Wedge or Dynamic Wedge function providing wedge field angles from 0° to 60°, and a maximum field size **not less than** 30cm x 40cm.
- Assisted Set-Up - Remote from Control room automatic positioning of the gantry, collimator, beam geometric parameters and the table isocentric rotation to the

positions specified in the field prescription

PATIENT SUPPORT TABLE:

Patient Table Motions.

- Longitudinal, Range **not less than** 100cm
- Transversal, Range **not less than** 25cm (±20cm)
- Vertical, Range **not less than** 45cm
- Patient Table Motion Control - Manual and Motorized
- Patient Table Position indicators accuracy ≦1mm and ≦0.5° in the whole range

Table Top.

- Patient load **not less than** 200 kg
- Low –absorption, carbon-fibre couch top for IGRT applications
- Remote Correction of patient position

MV ELECTRONIC PORTAL IMAGE DEVICE:

- Motorized retractable/Integrated
- Flat detector matrix of amorphous silicon technology with resolution **no less than** 1024 x 1024 pixels
- Pixel size at isocenter: **not more than** 0.5 mm, at detector: **not more than** 0.5 mm
- Image acquisition Modes - Single, Double, Multiple and Fluoroscopic (movie) image acquisition
- Support of DRR, Digital simulator images, RT image and RT plan objects
- Patient auto select mode
- Real-time imaging of IMRT segments using continuous imaging in single, multiple or movie-loop mode to support verification of dose conformance and QA of treatment quality.
- Computer controlled automated image acquisition and comprehensive analysis functions
- Anatomy/structure registration with reference images, template matching, annotations, geometrical measurements, image approval.
- On-line (at the linac) and Off-line (remote) analysis

PATIENT IMMOBILISATION 3D-CRT/IMRT/VMAT:

Breast Immobilisation:

- Carbon Fibre Breastboard with an elevation system complete **or equivalent**
- Bi-Axial Arm Support , MT-TAS-R/L.
- Wrist support, MT-TWS-S
- Hip stop
- Round head cup

Head and Neck Immobilisation:

- Head and Neck immobilisation designed for routine head and shoulder immobilization as an add-on system **or equivalent**
- Baseplate for head and neck treatment in supine and prone position
- Patient comfort pillows
- Prone Pillows for Prone treatments
- Thermoplastics Masks IMRT Reinforced Head only
- Thermoplastics Masks IMRT Reinforced Head, neck and shoulder

Pelvis Immobolisation:

- Foam Bellyboard system for patient-friendly non invasive positioning **or equivalent**.
- Baseplate for treatment in prone position
- Small insert
- Medium insert
- Large insert

TREATMENT PLANNING SYSTEM:

Full MLC-based planning system consisting of:

- 3D-CRT Licensed Treatment Planning
- 3D-CRT + IMRT Licensed Treatment Planning
- 3D-CRT + IMRT + VMAT Licensed Treatment Planning
- Doctor WS (Image fusion, contouring, simulation, plan review, etc)
- Integrated simulation application for contouring, beam placement, block/port definitions, and real-time DRRS. Including auto-segmentation tools.
- Template driven planning
- Full DICOM connectivity for import and export of images, dose plans, structured, registration, etc
- Multiple plan review with plan addition, subtraction and integrated DVH statistics analysis, profiles, etc
- Fully integrated fusion of CT with CT/MR/PET/NM images for CT simulation or treatment planning utilization.
- Conventional 3D-CRT planning support
- IMRT Planning support with Segment shape optimization and Beam weight optimization.
- Multiple cost function support: Radiobiological (EUD for serial organs AND parallel organs) and Physical (Dose volume based constraints)
- Multiple isocenters per plan possible.

Dose calculation algorithms:

- Advanced GPU Collapsed Cone for photon beams
- Monte Carlo for electron beams
- Monte Carlo for photons beams
- 02 planning and 02 contouring workstations

RECORD & VERIFY AND ONCOLOGY INFORMATION SYSTEM:

- R&V system should provide all Record and Verify functionality system for image guided RT, SRT and SRS.
- The R&V verification system should handle all manufacturers of linacs in the hospital and their technology as MLC, EPID, IMRT, IGRT.
- It shall be possible to add physicists check fields to a patient prescription without adding dose to the accumulated clinical dose to the patient.
- Server- Client based system allows access to patient data from any PC in the department - **5 or more** Client WS
- It shall address the clinical information Management needs across the entire spectrum of cancer in the department.
- Image-Enabled Oncology EMR, with a single Patient Database
- IGRT support On-line and Off-line, including full tools for registration and analysis.
- It shall be able to accept plans from any Treatment Planning System and CT-Simulation
- Quality Assurance mode to validate the dosimetric treatment plans prior to treatment
- It shall provide statistics, evaluation and analysis tools on all procedures done at the clinic and produce standard and customized reports

ALLIED EQUIPMENT/ACCESSORIES:

- UPS: High quality online UPS compatible with the LINAC. No local or Chinese UPS would be accepted.
- Chiller: Cooling system as per LINAC requirements

CIVIL WORK:

- Construction of bunker must be as per manufacturer design and as per requirements of PNRA following the WHO/International safety Standards.

SPECIALIZED HEALTH CARE AND MEDICAL EDUCATION DEPARTMENT

GOVERNMENT OF THE PUNJAB

Health Department

PRODUCT VOCABULARY MEDICAL STORE (PVMS) OF ENDOSCOPY

Volume - II , 2021

Section-I:

Endoscopy Equipment:

NOTE:
Minor variation in sizes and values will not be considered as reason of rejection against any item.

Section – I
Endoscopy Equipment

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**VIDEO GASTROSCOPE (ULTRA-SLIM / NASAL)**
Clinical Purpose	For diagnosis, Treatment & Therapy of esophageal, stomach, for ulcer, gastric cancer, biliary diseases, Barrett's esophageal treatment, for Pead's Patients

TECHNICAL SPECIFICATIONS

Ultra-Slim Video Gastro Scope with CMOS / CCD and advanced technological features as below:

Trans-nasal Video Gastroscope

Field of view	140° or more
Direction of view	Forward viewing
Depth of field	3 - 100 mm or better
Insertion tube diameter:	5.9 mm or less
Distal end diameter	5.9 mm or less
Channel inner diameter:	2.0 mm or more
Working length:	1100 mm or more
Angulations:	Up 210°, Down 90°, Right 100°, Left 100° or better

Observation facility for greater contrast of blood vessels and mucosa

Accessories:

- Standard set of Accessories

Optional (If any): Mandatory to quote.

02 Biopsy Forceps

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**HIGH DEFINITION VIDEO GASTROSCOPE (SLIM)**
Clinical Purpose	For diagnosis, Treatment & Therapy of esophageal, stomach, for ulcer, gastric cancer, biliary diseases, and Barrett's esophageal treatment.

TECHNICAL SPECIFICATIONS

Slim High Definition Video Gastro Scope with CMOS / CCD and advanced technological features as below:

Close Focus

Field of view	140° or more
Direction of view	Forward viewing
Depth of field	2 - 100 mm or better
Insertion tube diameter:	9.3 mm or less
Distal end diameter	9.2 mm or less
Channel inner diameter:	2.8 mm or more
Working length:	1030 mm or more
Angulations:	Up 210°, Down 90°, Right 100°, Left 100° or better

Observation facility for greater contrast of blood vessels and mucosa

Accessories:

- Standard set of Accessories.

Optional (If any): Mandatory to quote.

- 02 Biopsy Forceps

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**HIGH DEFINITION VIDEO GASTROSCOPE – STANDARD**
Clinical Purpose	For diagnosis, Treatment & Therapy of esophageal, stomach, for ulcer, gastric cancer, biliary diseases, Barrett's esophageal treatment, for Adult Patients.

TECHNICAL SPECIFICATIONS

High Definition Video Gastroscope with CCD / CMOS and advanced technological features as below:

Close Focus / Near Focus	
Field of view	140 degree
Direction of view	Forward viewing
Depth of field	2 -100 mm or better
Insertion tube diameter:	9.8 mm or less
Distal end Diameter	9.9 mm or less
Channel inner diameter:	2.8 mm or more
Bending Section:	Up 210°, Down 90°, Right 100°, Left 100° or better
Working Length:	1030 mm or more
Water Jet Function	

Observation facility for greater contrast of blood vessels and mucosa

Accessories:

- Standard set of Accessories

Optional (If any): Mandatory to quote.

- 02 Biopsy Forceps

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**HIGH DEFINITION VIDEO GASTROSCOPE (THERAPEUTIC)**
Clinical Purpose	For the Therapeutic treatment, cutting, resection, and usage of electrosurgical unit and laser treatment for mucosal and sub-mucosal dissection and diagnosis.

TECHNICAL SPECIFICATIONS

High Definition Video Gastroscope (Therapeutic) with CCD / CMOS and advanced technological features as below:

Close Focus

Field of view:	140° or better
Direction of view:	Forward Viewing
Depth of field:	2 - 100 mm or better
Distal end diameter:	11.0 mm or less
Insertion tube diameter:	11.6 mm or less
Channel inner diameter:	3.7 mm or more.
Working Length:	1030 mm or more
Angulations:	Up 210°, Down 90°, Right 100°, Left 100° or better

Water Jet Function

Observation facility for greater contrast of blood vessels and mucosa

Accessories:

- Standard set of accessories.

Optional (If any): Mandatory to quote.

- 02 Biopsy Forceps

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**VIDEO GASTROSCOPE (DUAL CHANNEL)**
Clinical Purpose	Dual channel scope can be used for treatment with twin accessories at the same time, or use two different accessories simultaneously, for support & resection, or for powerful suction via one channel & to use other channel as a source of treatment / therapy.

TECHNICAL SPECIFICATIONS

Video Gastroscope (Dual Channel) with CCD / CMOS and advanced technological features as below:

Field of view:	140°
Direction of view:	Forward viewing
Depth of field:	4 - 100 mm or better.
Distal end diameter:	13.2 mm or less
Insertion tube diameter:	12.8 mm or less
Working length:	1030 mm or more
Channel diameter:	2.8 mm & 3.7 mm or better
Angulations:	Up 180°, Down 90°, Right 100°, Left 100° or better
Water Jet Function	

Accessories:

- Standard set of accessories

Optional (If any): Mandatory to quote.

- 02 Biopsy Forceps

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**HIGH DEFINITION VIDEO ZOOM GASTROSCOPE**
Clinical Purpose	To identify the mucosal layer details under magnification for Endo-Mucosal resection or to treat ulcers on minute details. Zoom scope also helps to analyses the minute details of structure.

TECHNICAL SPECIFICATIONS

High Definition Video Zoom Gastroscope with CCD / CMOS and advanced technological features as below:

Optical magnification for zoom / dual focus mechanism

Direction of view:	Forward viewing
Field of view:	140° or better
Depth of Field:	7-100 or better
Insertion tube diameter:	9.9 mm or less
Distal end diameter:	10.6 mm or less
Working length:	1030 mm or more
Channel inner diameter:	2.8 mm or more
Bending Section:	Up 210°, Down 90°, Right 100°, Left 100° or better

Water Jet function

Observation facility for greater contrast of blood vessels and mucosa

Accessories:

- Standard set of accessories

Optional (If any): Mandatory to quote.

- 02 Biopsy Forceps

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**HIGH DEFINITION VIDEO COLONOSCOPE – SLIM**
Clinical Purpose	Ultra Slim is a small-diameter colonoscope for use in patients with smaller anatomy, such as children and smaller women. It can also help physicians complete procedures rectum-to-cecum in patients with inflammation, obstructions, or colon strictures, such as diverticulitis and post-operative adhesions.

TECHNICAL SPECIFICATIONS

High Definition Video Colonoscope (Slim) with CCD / CMOS and advanced technological features as below:

Close Focus / Near Focus

Direction of view:	Forward viewing
Field of view:	140° or better
Depth of field:	2 - 100 mm or better
Distal end diameter:	11.7 mm or less
Insertion tube diameter:	11.8 mm or less
Channel inner diameter:	3.2 mm or more
Working Length:	1680 mm or more
Angulations:	Up 180°, Down 160°, Right 160°, Left 160° or better

Water Jet Function

Observation facility for greater contrast of blood vessels and mucosa

Gradual Stiffness / Colo Assist / Advanced Force Transmission / I-Flex & True Torque / Adjustable stiffness / RIT

Accessories:

- Standard Accessories list

Optional (If any): Mandatory to quote.

- 02 Biopsy Forceps

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**HIGH DEFINITION VIDEO COLONOSCOPE - STANDARD**
Clinical Purpose	Therapeutic colonoscope used for the hemostasis, resection and ablation of benign and malignant disease, decompression, and recanalization of obstructed or dilated bowel, as well as foreign body extraction.

TECHNICAL SPECIFICATIONS

High Definition Video Colonoscope Standard with CCD / CMOS and advanced technological features as below:

Direction of view:	Forward viewing
Field of view	140° or better
Depth of field	4 - 100 mm or better
Distal end diameter	13.2 mm or less
Insertion tube diameter	13.2 mm or less
Channel inner diameter	3.7 mm or more
Working Length:	1680 mm or more
Angulations:	Up 180°, Down 180°, Right 160°, Left 160° or better

Water Jet Function

Observation facility for greater contrast of blood vessels and mucosa

Gradual Stiffness / Colo Assist / Advanced Force Transmission / I-Flex & True Torque / Adjustable stiffness / RIT

Accessories:

- Standard Set of Accessories

Optional (If any): Mandatory to quote.

- 02 Biopsy Forceps

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**HIGH DEFINITION VIDEO COLONOSCOPE WITH ZOOMING**
Clinical Purpose	To Identify the mucosal layer details under magnification for Endo-Mucosal resection or to treat ulcers on minute details. Zoom scope also help to analyses the minute details of structure

TECHNICAL SPECIFICATIONS

High Definition Video Colonoscope with zooming with CCD / CMOS and advanced technological features:
Optical magnification for Zoom scope / Dual Focus Scope

Direction of view:	Forward viewing
Field of view:	140° or better
Depth of field:	7 - 100 mm or better
Distal end diameter:	13.2 mm or less
Insertion tube diameter:	13.2 mm or less
Channel inner diameter:	3.7 mm or more
Working Length:	1680 mm or more
Angulations:	Up 180°, Down 180°, Right 160°, Left 160° or better

Water jet function
Observation facility for greater contrast of blood vessels and mucosa
Gradual Stiffness / Colo Assist / Advanced Force Transmission / I-Flex & True Torque / Adjustable stiffness / RIT

Accessories:

- Standard Accessories

Optional (If any): Mandatory to quote.

- 02 Biopsy Forceps

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**DUODENO VIDEO SCOPE**
Clinical Purpose	To diagnose and treat conditions associated with the pancreas to biliary system.

TECHNICAL SPECIFICATIONS

Video Duodenoscope with CCD / CMOS and advanced technological features as below:

Field of view:	100° or more
Direction of view:	5°-15° (Backward Viewing)
Depth of field:	5 - 60 mm or better
Distal end diameter:	13.6 or less
Insertion tube diameter:	11.6 mm or less
Working length:	1240 mm or more
Channel inner diameter:	4.2 mm
Angulations:	Up 120°, Down 90°, Right 90°, Left 90° or better

Observation facility for greater contrast of blood vessels and mucosa.

Detachable distal end cap

Accessories:

- Standard Accessories List

Optional (If any):

Disposable distal end cap (Mandatory to quote)

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**ENDOSCOPIC ULTRASOUND SYSTEM (EUS)**
Clinical Purpose	To diagnose sub-epithelial tumors (SETs) and extra-luminal lesions in the gastrointestinal tract.

TECHNICAL SPECIFICATIONS

High Resolution Color Ultrasound System for endoscopic Examination:

Operating modes

- B-mode
- Color Doppler / Color Flow
- Elastography
- Contrast harmonic imaging
- Compound harmonic mode
- Tissue harmonic imaging

Image

- Full / Central screen

Computing systems

- EUS system with alpha numeric keyboard and built in trackball / touchpad
- Freeze facility with keyboard or endoscope
- Foot switch
- Cine memory
- Built in hard disk / internal memory
- The studies can be stored on to CD or DVD or USB

Measurements & Softwares

- Measurement of parameters
- Patient data management

Accessories:

- Standard Accessories List

Optional (If any): (Procuring Agency must Specify):

LCD /LED

- High Definition Medical Grade 21" LED / LCD color monitor or larger

Digital Printer

- Medical grade color printer with 10 boxes of paper rolls of High Density
- Medical grade B/W printer with 20 paper rolls of High Density

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**ULTRASONIC LINEAR GASTRO VIDEO SCOPE**
Clinical Purpose	To Diagnosis Staging of mediastinal lymph nodes and tumors, staging of esophageal lymph nodes and tumors, Metastatic, celiac axis pathologies, esophageal tumors, staging of pancreas tumors and lymph nodes, EUS assisted resection, Ablation of mucosal lesions (polyps), Resection of sub-mucosal tumors, Puncture of pancreatic pseudo cysts for drainage, Injection therapy.

TECHNICAL SPECIFICATIONS	
Field of View:	100° or better
Direction of View:	Forward oblique 40 or more
Depth of Field:	3-100 mm or better
Distal End Diameter:	14.6 mm or less
Insertion tube:	12.8 mm or less
Instrument Channel:	3.7 mm or more
Working Length:	1250 mm or more
Scanning method:	Linear / Convex
Frequency:	Multi frequency 5-12 MHz or better
Scanning Range:	150° or more
Angulations:	Up 130°, Down 90°, Left 90°, Right 90° or Better

Accessories:

- Standard Set of Accessories

Optional (If any): Mandatory to quote.

- Balloons: (Qty – 10)

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**ULTRASONIC RADIAL VIDEO SCOPE**
Clinical Purpose	For Diagnostic use in general, no treatment, Examination of esophageal cancer, Examination of stomach wall, stomach cancer and staging of stomach cancer, Sub-mucosal tumors, Difficult situations at the papilla, Pancreatitis, during pull-out of the endoscope you can examine the entire stomach and stomach wall, from antrum to esophagus and nothing is missed, Observation of pancreatic duct from one side (papilla) to the other (pancreas)

TECHNICAL SPECIFICATIONS	
Field of View:	100° or better
Scanning range.	360°
Depth of Field:	3-100 mm
Direction of view	50^0 / Forward
Insertion Tube Diameter:	12.1 mm or less
Distal End Diameter:	13.4 mm or less
Channel Diameter:	2.2 mm or more
Working Length:	1250 mm or more
Scanning Method:	Radial
Frequency:	Multi Frequency 5-12 MHz
Angulations:	Up 130°, Down 70°, Left 70°, Right 70° or Better

Accessories:

- Standard Accessories list

Optional: Mandatory to quote.

- Balloon: (Qty – 10)

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**SMALL INTESTINAL VIDEOSCOPE (ADULT)**
Clinical Purpose	Scope must provide push and pull technique and EGD disease diagnosis. Device enables to carry out fast and easy illeoscopy and upper Enteroscopy procedures.

TECHNICAL SPECIFICATIONS

Efficient hand control & automatic pressure control

Field of View:	140^0 or better
Insertion Tube Diameter:	9.3 mm -11.6 mm or better
Distal End Diameter:	9.4 mm -11.6 mm or better
Instrument Channel:	2.8 mm or more
Working Length:	1680 mm or more.
Angulations:	Up 180^0, Down 180^0, Right 160^0, Left 160^0 or better

Balloon Controller:

Set Pressure of Balloon: 5Kpa / 60 mbar or more

Accessories:

- Set of standard Accessories

Optional (If any): Mandatory to quote.

- Over Tube / TTS Balloon / Integrated Reusable Balloon
- Separate Balloons in case of Overtube / TTS **(Qty: 20)**

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**HIGH DEFINITION VIDEO PROCESSOR (HD)**
Clinical Purpose	It helps in vivo diagnostic ensures faster detection, easier demarcation, and characterization of gastrointestinal lesions to support improved patient outcomes.

TECHNICAL SPECIFICATIONS

High Definition Video System having following features:
HD-SDI & DVI outputs
HD Image Quality with 1920 x 1080 Resolution
Programmable functions through remote buttons / endoscope switches
Iris Mode / Light Exposure Peak
Pre-Freeze / Freeze Scan / Anti Blur Function / Shake Reduction Mode / Peak Detection
Freeze Mode
Color Adjustments: Red, Blue: -4 to +4 (± 4) Steps or more
Contrast – 3 Steps
Structure Enhancement / Emphasis
Electronic Magnification / Digital Zoom
45 or more Patients data
Image storage facility (internal / external device)
Keyboard for data handling
Capable for visual enhancement and differentiation of vessels and Capillaries
Compatible with ERCP, EUS & Magnification / Zoom Scopes

Accessories:

- Standard Accessories with Leakage Taster

Optional (If any):

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**XENON LIGHT SOURCE 300 WATT / 4-LED OR MORE LIGHT SOURCE**
Clinical Purpose	It enables visualization of gastrointestinal mucosal structures also contributing to clear and more detailed visualization of mucosa.

TECHNICAL SPECIFICATIONS

Features:

Separate or built in advanced light Source for Video Scopes with the following main features:

- 300 Watt Xenon / 4-LED or more light source
- Average lamp life: Approx. 500 hours or more
- Automatic Light control / Light Exposure Control / Aid Brightness
- Air pump

Accessories:

- Standard Set of Accessories.
- Water Bottle

Optional (If any):

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**CO2 REGULATOR / CO2 INSUFFLATOR**
Clinical Purpose	It provides greater visibility for improved diagnosis and polyp detection. It minimizes patient discomfort associated with bloating and cramping from room air. Reduces the number of patients that need to be seen by physician in recovery.
TECHNICAL SPECIFICATIONS	
Separate CO2 Regulator / CO2 Insufflator 02 different controlled flow rate settings	
Accessories: - Standard set of accessories - Hose Gas Tube (Local supply) - Cylinder (Local supply) **Quantity 2**	
Optional (If any):	

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**26 INCH LED / LCD HIGH DEFINITION COLOR MONITOR**
Clinical Purpose	To display the clinical findings.
TECHNICAL SPECIFICATIONS	
26" or more Medical Grade Monitor Trolley mounted system for teaching Resolution should be 1920 x 1080 or more	
Accessories: - Standard Set of Accessories.	
Optional (If any):	

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**32 INCH LED / LCD HIGH DEFINITION COLOR MONITOR**
Clinical Purpose	To display the clinical findings.
TECHNICAL SPECIFICATIONS	
32" or more Medical Grade Monitor Wall mounted system for teaching Resolution should be 3840 x 2160 / 4K or more	
Accessories: - All Standard Set of Accessories	
Optional (If any):	

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**BATTERY BACKUP**
Clinical Purpose	For Battery Backup
TECHNICAL SPECIFICATIONS	
Built in or Separate battery backup for whole system with minimum 30 minutes battery backup	
Accessories: - Standard Set of Accessories	
Optional (If any):	

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**IMAGE & VIDEO CAPTURING DEVICE**
Clinical Purpose	To record images and videos of the procedures.
TECHNICAL SPECIFICATIONS	
Separate or built in video recorder Images & Video Recording Facility Sharing facility via USB (450GB) To be Supplied Locally	
Accessories:	
Optional (If any):	

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**COMPUTER SYSTEM**
Clinical Purpose	To manage the data for clinical symptoms
TECHNICAL SPECIFICATIONS	
Desktop Latest Computer with 2TB Hard Drive With USB port 26" LCD / LED Monitor i.e. Dual Monitors 2 Keyboard, Mouse Computer Trolley Color Printer Accessories and connecting cables from endoscopic system to computer To be Supplied Locally	
Accessories:	
Optional (If any):	

Clinical Specialty	**Endoscopy**
Generic Name	**ENDOSCOPY REPORTING & ARCHIVING SYSTEM WITH HMIS COMPATIBILITY**
Clinical Purpose	To manage the reporting of patients.
Technical Specification	
• The end-user would specify the configurations of the software & allied gadgets to fulfill the departmental requirements	
Accessories:	
Optional (If Any):	

Clinical Specialty	**Endoscopy**
Generic Name	**VIDEO SIGMOIDSCOPE / SHORT LENGTH COLONO SCOPE**
Clinical Purpose	To diagnose & treat rectum & sigmoid.

Technical Specification

High Definition Video Sigmoid Scope / Short Colonoscope Standard with CCD / CMOS and advanced technological features
as below:

Direction of view:	Forward viewing
Field of view	140° or better
Depth of field	4 - 100 mm
Distal end diameter	13.2 mm or less
Insertion tube diameter	13.2 mm or less
Channel inner diameter	3.7 mm or more
Working Length:	1300 - 1330 mm or less
Angulations:	Up 180°, Down 180°, Right 160°, Left 160° or better

Water Jet Function
Observation facility for greater contrast of blood vessels and mucosa
ColoAssist / Advanced Force Transmission / I-Flex & True Torque / RIT / Adjustable Flexibility

Accessories:

- Standard Set of Accessories

Optional (If Any):

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**WATER PUMP**
Clinical Purpose	Used with water jet for cleaning the lens of scope.
TECHNICAL SPECIFICATIONS	
Water Jet / Flushing pump for scopes, compatible with all scopes	
Accessories:	
Optional (If any):	

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**WORKSTATION (DEDICATED FOR ENDOSCOPY)**
Clinical Purpose	To placing all components of endoscopy system.
TECHNICAL SPECIFICATIONS	
Trolley based Workstation Swivel arm for monitor Sliding Keyboard shelf / tray	
Accessories:	
Optional (If any): Mandatory to quote. - Isolation transformer	

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**MODULAR ENDOSCOPY SUITE (WORKSTATION)**
Clinical Purpose	To placing all components of endoscopy system.

TECHNICAL SPECIFICATIONS

Modular endoscopy system with the following configurations:

Endoscopy Pendant:

Adjustable and operatable easily within designated area
Double arm ceiling mounted pendant
Resistant to chemical along with arm to incorporate monitor of weight up to 24 kg or better
Dual Arm 1000/800 mm or better
Having electromagnetic / Pneumatic brakes
Having facility of Swiveling arm
12 X universal sockets & Standard Earth Parts
RJ45 with Two Ports
Outlet (British Standard). 1x Oxygen (O2),1x Nitrous (N2O),1x Medical Air (MA4),1x Vacuum (VAC),
1x CO2 sockets
3-4 Shelves, 1x drawer for accessories
Vertical pole made of medical grade Material Stainless steel to incorporate accessories.
IV Stand having 4 hooks

Stretcher Trolley:

2-3 sections Patient Shifting Trolley.
Back section should be adjustable from 0 – 85 Degree Approx.
Should have Trendelenburg / Revere Trendelenburg positions 12 / -12 degrees approx.
Oxygen Bottle Holder
Wire basket
4 Bumper at all corners to protect trolley
Patient Safe Working Load capacity min 250 kg or more
IV rod

NOTE: This item can be a part of package but not mandatory to quote.

Accessories: with all standard accessories.

Optional (If any): Mandatory to quote.

- Local made Endoscopy Hanger

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**ENDOSCOPIC WASHER & DISINFECTOR (IMPORTED)**
Clinical Purpose	To disinfect the scope from viral and bacterial contamination.

TECHNICAL SPECIFICATIONS
Automatic High Pressure Washing & Cleaning capability Free standing type / Rack type Applicable scopes: Flexible endoscopes Number of reprocessed scopes 01 at a time Number of washing basin 01 Cleaning time setting. Disinfection time setting. Display of Parameters Compatible with quoted scopes Complete with all accessories Ready to use
Accessories: - Standard set of Accessories
Optional (If any): Mandatory to quote. - Operational Consumables / Disinfectant Solutions (Should be quoted separately)

OR

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**ENDOSCOPIC WASHER (LOCAL)**
Clinical Purpose	To disinfect the scope from viral and bacterial contamination.

TECHNICAL SPECIFICATIONS
Automatic for Flexible endoscopes Display of Parameters Compatible with quoted scopes Complete with all accessories Ready to use
Accessories: - Standard set of Accessories
Optional (If any): Mandatory to quote. - Operational Consumables / Disinfectant Solutions (Should be quoted separately)

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**ULTRASONIC CLEANER FOR FLEXIBLE ENDOSCOPIC ACCESSORIES.**
Clinical Purpose	An Ultrasonic cleaner is an application that is used for cleaning different types of medical equipment such as surgical instrument, diagnostic tools, etc. with the help of ultrasonic rays and appropriate cleaning solvent.
TECHNICAL SPECIFICATIONS	
5 L or more capacity Adjustable cleaning cycle Dedicated instruments trays / basket for endoscopy accessory cleaning.	
Accessories: - Standard set of Accessories	
Optional (If any):	

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**SUCKER MACHINE HEAVY DUTY DEDICATED FOR ENDOSCOPY**
Clinical Purpose	Suction machine used for the suction of debris, clinical pathologies, and mucus from the abdominal part.
TECHNICAL SPECIFICATIONS	
Heavy duty Autoclavable Aspiration rate up to 50-60 liters / minutes at 650-900 mm.Hg Vacuum continuously adjustable 10x bacterial filter Complete aspiration set Overflow safety device	
Accessories: - Standard Set of Accessories.	
Optional (If any):	

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**DIATHERMY MACHINE DEDICATED FOR ENDOSCOPY**
Clinical Purpose	To cut, coagulate the lesion and resect the lesion via High frequency.

TECHNICAL SPECIFICATIONS

Microprocessor based Electrosurgical unit
Separate controls for Monopolar and bipolar coagulation
Output Power for Monopolar cut 120 Watt or better
Output Power for Monopolar Coagulation 120 Watt or better
At least 2- blend modes
Output Power for Bipolar coagulation 100 watt or more
The system must have Automatic self-test
The Machine must have a **GASTROCUT / ENDOCUT / PULSE CUT** Function

Accessories:

- Trolley with Lockable wheels – Local
- Patient plate reusable
- Foot switch

Optional (If any):

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**ARGON PLASMA WITH ELECTROSURGICAL UNIT FOR ENDOSCOPY**
Clinical Purpose	To cut, coagulate the lesion and resect the lesion via High frequency.

TECHNICAL SPECIFICATIONS

Microprocessor based Electrosurgical unit
Separate controls for Monopolar and Bipolar coagulation
Output Power for Monopolar cut 120 Watt or better
Output Power for Monopolar Coagulation 120 Watt or better
At least 4 - blend modes or more
Output Power for Bipolar coagulation 100 watt or more
The system must have Automatic self-test
The Machine must have a **GASTROCUT / ENDOCUT / PULSE CUT** Function

Argon Plasma Coagulation:

Argon Plasma Coagulation with the following features:
Argon Cutting
Endoscopic Cutting
Argon Standard coagulation
Forced Coagulation
Soft / Moderate Coagulation
Spray Coagulation
Both Separate and combined ESU / APC are Acceptable.

Accessories:

- Compatible footswitch
- Re-usable Patient Plate
- Argon Gas regulator with pressure sensor
- Argon Cable
- Argon gas cylinder 4 - 5 Liter or more (Local Supply)
- Monopolar cable for argon flexible electrode.
- Local trolley with antistatic lockable wheels.

Optional (If any): Mandatory to quote.

Flexible argon probe, dia 2.3 mm or more (Compatible with scope) **(Qty: 10)**

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**GASTROESOPHAGEAL HIGH RESOLUTION SOLID STATE MANOMETRY**
Clinical Purpose	To find the parameter via pressure for esophageal reflux diseases.

TECHNICAL SPECIFICATIONS

Modules:

- Manometry Module
- Interface cable

Trolley:

- With computer and color Laser Printer with 24'' Monitor LCD. Analysis

Software:

- Esophageal catheter with Software
- 32- 36 Pressure channel Catheter with 12-16 Impedance channel
- Anorectal Catheter with software with Bio-feedback Pelvic floor reconstruction
- 20 Plus channel for HRAM
- Patient database software + Ph analysis software + Impedance software

Ph Monitoring:

Ambulatory PH-RECORDER

- Flash Card / Wireless blue tooth / USB Cable and dongle for Pc.
- 6 or more impedance channel + 1 PH. 10 Qty.
- 6 or more Impedance channel + 1 Ph 10 Qty.

Complete with standard accessories.

Accessories:

- Standard set of Accessories

Optional (If any):

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**CABINET FOR SCOPE HANGING**
Clinical Purpose	For the proper storage of the scope so to avoid fungus infection.

TECHNICAL SPECIFICATIONS

State-of-the-art Endoscope Storage and Drying Cabinets for the safe storage of endoscopes.
Storage of up to 8 -10 endoscopes
Up to 30 days storage or more
HEPA-filtered air supplied to each endoscope ensures channels are dried
Secure mounting for endoscope control and light guide plug

Imported (to be supplied by the same Vendor)

NOTE: This item can be a part of package but not mandatory to quote.

Accessories:

- Standard set of Accessories

Optional (If any): Mandatory to quote.

- With full traceability of endoscopes

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**FOWLER BEDS (MANUAL OPERATED) DEDICATED FOR ENDOSCOPY**
Clinical Purpose	A bed specially designed for hospitalized patients or others in need of some form of health care.

TECHNICAL SPECIFICATIONS

3 Crank Manual Operation
Fowler and Vascular positions
Overall Dimensions 2130 mm(L) x 914 mm(W) x 425 mm(H)(approx.)
Headrest & Leg- rest Adjustment with adjustment cranks on foot end
Adjusting cranks when not in use can be hidden under bed
Easily removable fixed head and foot boards made from Polypropylene materials
Folding Metallic Side Rails
Knee moves adjustment with gradual
360^0 Imported single Castors 12.5mm with linear brake and directional lock for linear directions. Plastic protection bumpers
Urine Bag holders
INCLUDED:
Accessories slots
Over bed table
Bed side locker
Mattress
IV Stand

Accessories:

- Standard set of accessories

Optional (If Any):

Clinical Specialty	**Endoscopy**
Generic Name	**FLUROSCOPY FOR ERCP / GI PROCEDURES.**
Clinical Purpose	The hardware, software, networking, and main server configurations to fulfill these user requirements in ERCP/GI Procedures.

Technical Specification

- Endo Package is a unique configuration designed in Joint Corporation with clinicians to optimize endoscopy procedures under fluoroscopic X-Ray Control.
- Dedicated 26 inch Medical Grade Monitor and Duo 19 inch Fluoroscope Monitor.
- Zoom 02 Levels
- Pulse Fluoroscopy range 40-120 KV.
- mA Range 1.5-250mA (200-240V)
- High Frequency 40KHz, 25kW
- Adaptive Image Processing
- Anode Speed 2850 RPM (50 Hz), 3450 RPM (60 Hz)
- Maximum anode heat content 365 kHU,
- Maximum anode heat dissipation 1000W / 85kHU/min
- Powered by integrated advanced active cooling and heat management system.
- 30cm x 30cm Flat Panel
- Detector Matrix
- Overview format 1536x 1536 pixels
- Mag Mode 1: 1024 x 1024 pixels
- Mag Mode 2: 768x 768 pixels
- Surgical Imaging table represents an important advance in developing the low dose technology field.
- C-Arm Orbital rotation -120° to +45°
- Motor Driven Vertical Travel
- Source image receptor distance 105 cm
- C-Arm Vertical free space 84cm
- C-ARM Angulation 225° and Table free space 360° access.
- Surgical Imaging table represents an important advance in developing the low dose technology field.
- Type of Flat Panel Detector: amorphous Silicon Photo Diode TFT Technology.
- Scintillator: cesium iodide
- Vision Center TFT Touch Screen on C-ARM Stand and Monitor Cart.

Accessories

- Standard Set of Accessories.

Optional (If Any). Mandatory to quote.

- Server Interface for endoscopic cleaning machine.
- Server interface with Endoscopic Ultrasound
- Server interface with fluoroscope images.

Clinical Specialty	Endoscopy
Generic Name	FLUOROSCOPY SYSTEMS DEDICATED FOR GI/ERCP WITH ARTIFICIAL INTELLIGENCE
Clinical Purpose	Fluoro Systems for GI/ERCP with Artificial Intelligence is a device to provide an automated Region of interest that manages exposure to the patient and operator. The system is intended for use in Radiographic/fluoroscopic applications including cardiac, vascular, general radiographic/ fluoroscopic diagnostic, and interventional x-ray imaging for General Populations

Technical Specification

- Utilizes **AI** to minimize dose to patients Reduces scatter radiation to the physician and staff.
- Automatic or manual mode available based on user preference.
- AI should completely block the radiation beam
- Delivers maximum radiation reduction without disrupting workflow.
- 360° lead shielding protection on image detector (above the table) and below the table on all 3 sides at the head end X Reduces scatter radiation exposure to doctors, patients, and staff
- 10 way motorized table motions includes of elevation, longitudinal, transverse, tilt, and cradle.
- Cradle roll motion lends to the filling and draining of ducts.
- Simultaneous motions for quicker patient positioning
- 500lbs weight capacity with wide tabletop
- C-Arm should pivot +/- 90 degrees out of the way toward the head or foot of the table.
- Fully motorized/integrated C-arm and Table
- C-arm and table are intuitive and controlled from a single convenient panel
- 30 x 30 flat panel detector increases visibility over a greater anatomical area, especially for complicated therapies
- Two Mag modes allow zooming for the finest detail.
- Pulsed Fluoroscopy provides decreased patient dose without loss of image quality.
- 65 kW, high frequency generator
- 1.0 MHu, high speed x-ray tube with fast cooling feature
- Reference monitor for 1 to 4 select images
- Last image holds saves to hard drive
- Ability to save fluoro loops directly from foot pedal
- DICOM 3.0 Interface
- PACS integration
- Ability to fit x-ray, GI & anesthesiology equipment into 16' x 19' room
- Geometric radiation dose reduction.
- All motorized C-arm motions
- Integrated on-screen measurement software tool kit
- Integrated CD/DVD burner with viewer

• DSA functionality • Isocentric floor mounted i/c positioner • Three (3) function foot switch • Ceiling mounted flat panel display suspension for four (4) 19" flat panel displays (2 x 2) • 42" ERCP large monitor. • *2x 42" displays, 9 input monitor manager, 21.5" touchscreen console* • Flat panel radiation shield for flat panel detectors • Square field collimator • High speed dual focus x-ray tube w/ fast cooling anode • Quiet style heat exchanger • CPU electronics enclosure • Integrated fluoroscopic dose readout system • FDA Approved AI system.
Accessories
• Standard Set of Accessories.
Optional (If Any).

Section - II:

Endoscopy System with Artificial Intelligence

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**VIDEO ENDOSCOPY SYSTEM COMPATIBLE WITH AI MODULE & SOFTWARE**
Clinical Purpose	It helps in vivo diagnostic ensures faster detection, easier demarcation and characterization of gastrointestinal lesions to support improved patient outcomes.

TECHNICAL SPECIFICATIONS

High Definition Video System having following features:
Must have Artificial Intelligence Module compatibility
Digital output: HD-SDI & DVI / 12G-SDI or better
HD Image Quality with 1920 x 1080 Resolution or better
Programmable functions through remote buttons / endoscope switches
Iris Mode / Light Exposure Peak
Pre-Freeze / Freeze Scan / Anti Blur Function / Shake Reduction Mode / Peak Detection
Freeze Mode
Color Adjustments: Red, Blue: -4 to +4 (± 4) Steps or more
Contrast – 3 Steps
Structure Enhancement / Emphasis
Electronic / Digital: Zoom / magnification
45 or more Patient data
Image storage facility (Internal / External Device)
Keyboard for data handling
Capable for visual enhancement and differentiation of vessels and Capillaries:
(BLI, LCI, FICE / TXI, RDI, Bi-MAC, NBI / I-Scan & OE, SE, CE, TEB, TEC, TEE)
Compatible with ERCP, EUS & Magnification / Zoom Scopes

XENON LIGHT SOURCE 300 WATT / 4-LED OR MORE LIGHT SOURCE

Features:

Separate or built in advanced light Source for Video Scopes with the following main features:

- 300 Watt Xenon / 4-LED or more light source
- Average lamp life: Approx. 500 hours or more
- Automatic Brightness Adjustment
- Air pump
- Lamp / light cooling method: forced air cooling
- High intensity mode / Transmitted Illumination / Xlum Mode
- Memorization of set-values

Accessories:

• Standard Set of Accessories **32 inch LED / LCD High Definition Color Monitor** • 32" or larger Medical Grade Monitor • Wall mounted system for teaching. • Resolution should be 3840 x 2160 / 4K or more
Accessories: - Standard Accessories - Leakage Tester - Water Bottle
Optional (If any):

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Endoscopy
Generic Name	**ARTIFICIAL INTELLIGENCE MODULE FOR EARLY CANCER DETECTION**
Clinical Purpose	To increase the diagnostic & clinical Findings.

TECHNICAL SPECIFICATIONS

Real-Time Detection:

- **Detection:** indicates the area where the suspicious polyp has been detected
- **Visual-Assist Circle / Bracket:** lights up in the direction where suspicious polyp is detected
- **Sound Signal:** when a suspicious polyp is detected

Characterization Support:

- **Status Bar / Side Bar:** indicated the status of characterization analysis regarding the suspected area
- **Visual Assist Circle / Bracket:** characterizes in color whether the poly is detected
- **Position Map:** indicates the position of the suspected area

Consists of the following:

- Hardware: Expansion Unit – Compatible with the above Video Processor System (From Section-II)
- Software for the above stated purposes

Accessories:

- All Standard Set of Accessories

Optional (If any):

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	**Endoscopy**
Generic Name	**AI COMPATIBLE HIGH DEFINITION VIDEO COLONOSCOPE – SLIM**
Clinical Purpose	To support of detection, characterization of polyps through artificial intelligence.

TECHNICAL SPECIFICATIONS

High Definition Video Colonoscope (Slim) with CCD / CMOS and advanced technological features as below:

Close Focus / Near Focus

Direction of view:	Forward viewing
Field of view:	140° or better
Depth of field:	2 - 100 mm or better
Distal end diameter:	11.7 mm or less
Insertion tube diameter:	11.8 mm or less
Channel inner diameter:	3.2 mm or more
Working Length:	1680 mm or more
Angulations:	Up 180°, Down 160°, Right 160°, Left 160° or better

Water Jet Function

ColoAssist Adjust / Advanced Force Transmission / I-Flex & True Torque / RIT

Observation facility for greater contrast of blood vessels and mucosa (BLI, LCI / TXI, RDI / I-Scan & OE, SE, CE ,TEB, TEC, TEE)

Must be Compatible with AI System & capable of AI features

Accessories:

- Standard Accessories list.

Optional (If any): **Mandatory to quote.**

- 02 Biopsy Forceps

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	**Endoscopy**
Generic Name	**AI COMPATIBLE HIGH DEFINITION VIDEO COLONOSCOPE - STANDARD**
Clinical Purpose	To support of detection, characterization of polyps through artificial intelligence.

TECHNICAL SPECIFICATIONS

High Definition Video Colonoscope Standard with CCD / CMOS and advanced technological features as below:

Close Focus / Near Focus

Direction of view:	Forward viewing
Field of view	140° or better
Depth of field	4 - 100 mm
Distal end diameter	13.2 mm or less
Insertion tube diameter	13.2 mm or less
Channel inner diameter	3.7 mm or more
Working Length:	1680 mm or more
Angulations:	Up 180°, Down 180°, Right 160°, Left 160° or better

Water Jet Function

ColoAssist Adjust / Advanced Force Transmission / I-Flex & True Torque / RIT

Observation facility for greater contrast of blood vessels and mucosa (BLI, LCI / TXI, RDI / I-Scan & OE, SE, CE ,TEB, TEC, TEE)

Must be Compatible with AI System & capable of AI features

Accessories:

- Standard Set of Accessories

Optional (If any): Mandatory to quote.

- 02 Biopsy Forceps

Section III:

For Compatible / Existing Systems :

Important Note:

This Section of PVMS is only Applicable for Existing / Already Installed Systems at any hospitals and the following items can be purchased to upgrade the existing system. These cannot be made part of any package with Section-I or Section-II for any new procurements.

Section-III:

Compatible / Addition with the Existing System Installed in Endoscopy Units.

PVMS OF MEDICAL EQUIPMENT Refer to the NOTE of Section-III, for the applicability purposes.	
Clinical Specialty	Endoscopy
Generic Name	**HIGH DEFINITION VIDEO COLONO SCOPE – SLIM TYPE**
Clinical Purpose	Ultra-Slim colonoscope for use in children, smaller women and other patients with much smaller anatomy than usual. It can also help physician's complete procedures rectum-to-cecum in patients with inflammation, obstructions, or colon structures, such as diverticulitis and post-operative adhesions.
TECHNICAL SPECIFICATIONS	
High Definition Video Colonoscope (Slim) with CCD / CMOS & advanced technological features as below: One Step / One Touch Connector Pre-Freeze / Anti-Blur Function Smart-Bend Colonoscope (Up 210^0 Degrees Bending) Direction of view: Forward viewing Field of view 140° or better Depth of field 3 - 100 mm or better Distal end diameter 9.8 mm or less Insertion tube diameter 10.7 mm or less Channel inner diameter 2.8 mm or more Working Length: 1650 mm or more Angulations: Up 210°, Down 160°, Right 160°, Left 160° or better Observation facility for greater contrast of blood vessels and mucosa (BLI, LCI / TXI, RDI) Advanced Force Transmission / RIT	
Accessories: - Standard Set of Accessories.	
Optional (If any): Mandatory to quote 02 Biopsy forceps	

PVMS OF MEDICAL EQUIPMENT Refer to the NOTE of Section-III, for the applicability purposes.	
Clinical Specialty	Endoscopy
Generic Name	**VIDEO ENTEROSCOPE – DOUBLE BALLOON**
Clinical Purpose	Scope must provide push and pull technique and EGD disease diagnosis. Device enables to carry out fast and easy illeoscopy and upper Enteroscopy procedures.

TECHNICAL SPECIFICATIONS

Double Balloon Enteroscope with Super CCD technology and the advanced technological features as below:
Close Focus
The scope must be equipped with Double Balloon Endoscopy feature.
Great stability of position and smooth insertion capability

Field of View:	140°
Observation range:	2-100 mm
Distal End Diameter:	9.4 mm
Flexible Portion Diameter:	9.3 mm
Bending Capability:	UP 180° ; Down 180° ; Right 160^0 ; Left 160^0
Channel Diameter:	3.2 mm
Working Length:	2000 mm
Total Length:	2300 mm

Accessories:

- Balloon Controller Unit
- Over Tube **(Qty: 50)**
- Balloons **(Qty: 50)**

Optional (If any): Mandatory to quote

02 Biopsy forceps

PVMS OF MEDICAL EQUIPMENT Refer to the NOTE of Section-III, for the applicability purposes.	
Clinical Specialty	Endoscopy
Generic Name	**SLIM TYPE ENTEROSCOPE**
Clinical Purpose	Slim type Enteroscope is to be used in pediatric patients for the same purpose as Adult Enteroscope is used for Adult Patients.
TECHNICAL SPECIFICATIONS	
Slim Type Double Balloon Enteroscope with the advanced technological features as below: Close Focus Field of view 140 degree or more Depth of field 2 -100 mm or better Insertion tube diameter: 7.7 mm or less Distal end diameter: 7.5 mm or less Channel inner diameter: 2.2 mm or more Bending Section: Up 180°, Down 180°, Right 160°, Left 160° or better Working Length: 2000 mm or more With Standard Set of Accessories	
Accessories: - Balloon Controller Unit - Over Tube **(Qty: 10)** - Balloon **(Qty: 20)**	
Optional (If any): **Mandatory to quote** 02 Biopsy forceps	

PVMS OF MEDICAL EQUIPMENT Refer to the NOTE of Section-III, for the applicability purposes.	
Clinical Specialty	Endoscopy
Generic Name	**SHORT DOUBLE BALLOON ENTEROSCOPE**
Clinical Purpose	The 'short' Double Balloon Endoscope (sDBE) is engineered to overcome technically-challenging therapeutic ERCP procedures in patients with surgically-altered anatomy such as Roux-en-Y reconstruction or hepaticojejunostomy anastomosis. It provides compatibility with most standard ERCP devices as well as superior maneuverability for smoother insertion in situations of complex anatomy. It's also suitable in case of biliary intervention for post-surgical anatomy.

TECHNICAL SPECIFICATIONS

Short Double Balloon Enteroscope with the advanced technological features as below:

Close Focus

Field of view 140 degree or more

Depth of field 2 -100 mm or better

Insertion tube diameter: 9.3 mm or less

Distal end diameter: 9.4 mm or less

Channel inner diameter: 3.2 mm or more

Bending Section: Up 180°, Down 180°, Right 160°, Left 160° or better

Working Length: 1550 mm or more

Total length: 1850 mm or more

With Standard Set of Accessories

Accessories:

- Balloon Controller Unit
- Balloon Over Tube **(Qty: 10)**

Optional (If any): **Mandatory to quote**

02 Biopsy forceps

PVMS OF MEDICAL EQUIPMENT Refer to the NOTE of Section-III, for the applicability purposes.	
Clinical Specialty	Endoscopy
Generic Name	**FULL HD VIDEO PROCESSOR WITH INTEGRATED 3-LED LIGHT SOURCE**
Clinical Purpose	It helps in vivo diagnostic ensures faster detection, easier demarcation and characterization of gastrointestinal lesions to support improved patient outcomes.

TECHNICAL SPECIFICATIONS

- Full High definition endoscopy video system center
- Digital Output: 2xDVI (1920x1080p) or (1280 x 1024p)
- HD Image Quality with 1920x1080p Resolution
- RGB TV, S-Video
- Freeze mode
- Aid Brightness function
- Noise Reduction function
- Electronic Zoom
- 45 patients list data entry storage
- Internal memory: 4 GB
- 3-LED Light Source integrated with Processor within one unit
  Illumination mode, Recording Status, Index Image, Focus Indicator
- Capable for visual enhancement and differentiation of vessels and capillaries Image enhancement setting: (BLI, LCI, BLI-Bright)
- Iris mode – Auto, Avg, Peak
- Shake Reduction Mode
- Structure Emphasis, Color Emphasis, Contrast 3 steps, Color Adjustment – 9 settings
- Keyboard for data handling
- Compatible with ERCP, EUS & Zoom Scopes
- Compatibility with the latest as well as at least 2 previous series of scopes
- Must have Artificial Intelligence Module Compatibility & Compatibility with A.I compatible scopes

Accessories:

- Standard Accessories

Optional (If any):

PVMS OF MEDICAL EQUIPMENT Refer to the NOTE of Section-III, for the applicability purposes.	
Clinical Specialty	Endoscopy
Generic Name	**FULL HD VIDEO PROCESSOR WITH INTEGRATED LED LIGHT SOURCE**
Clinical Purpose	It helps in vivo diagnostic ensures faster detection, easier demarcation and characterization of gastrointestinal lesions to support improved patient outcomes.
TECHNICAL SPECIFICATIONS	
High Definition Video System having following features: HD-SDI & DVI outputs HD Image Quality with 1920 x 1200 Resolution Programmable functions through endoscope switches Iris Mode Pre-Freeze / Freeze Scan / Anti Blur Function / Shake Reduction Mode / Peak Detection Freeze Mode Color Adjustments: Red, Blue: (± 8) Steps or more Contrast – 3 Steps Structure Enhancement Electronic Zoom 45 or more Patients data Image storage facility via USB Memorization of settings Keyboard for data handling Capable for visual enhancement and differentiation of vessels and Capillaries Integrated LED Light Source	
Accessories: - Standard Accessories	
Optional (If any):	

PVMS OF MEDICAL EQUIPMENT Refer to the NOTE of Section-III, for the applicability purposes.	
Clinical Specialty	Endoscopy
Generic Name	**HIGH DEFINITION DUODENO VIDEO SCOPE (SLIM)**
Clinical Purpose	To diagnose and treat conditions associated with the pancreatobiliary system.

TECHNICAL SPECIFICATIONS

Slim High Definition Video Duodenoscope with CCD / CMOS and advanced technological features as below:

Field of view:	100°
Direction of view	15° or better (Backward Viewing)
Depth of field:	4 - 60 mm or better
Distal end diameter:	12.5 or less
Insertion tube diameter	10.8 mm or less
Working length:	1250 mm or more Channel inner
diameter:	3.2 mm or more
Angulation:	Up 120° Down 90 Right 105° Left 90° or better

Observation facility for greater contrast of blood vessels and mucosa.

Accessories:

- Standard set of Accessories.

Optional (If any): Mandatory to quote

02 Biopsy forceps

PVMS OF MEDICAL EQUIPMENT Refer to the NOTE of Section-III, for the applicability purposes.	
Clinical Specialty	Endoscopy
Generic Name	**HIGH DEFINITION VIDEO PROCESSOR FOR LED ON TIP SCOPES**
Clinical Purpose	It helps in vivo diagnostic ensures faster detection, easier demarcation and characterization of gastrointestinal lesions to support improved patient outcomes.

TECHNICAL SPECIFICATIONS

- Integration and connectivity with hospital IT
- Clear visualization of settings and simplified adjustment during procedures
- Internal image capture system for simple management of patient still image and video files
- Instant review of all files possible on processor tablet screen or main endoscopy monitor screen.
- HD+ image sensor to provide clear and natural images for your diagnostic needs.
- Temperature controlled LED illumination delivers high-level in depth and near focus brightness and sends the heat from the distal tip to backwards.
- One-handed connection and easier endoscope handling with new small, lightweight connector.
- Watertight connector without soaking cap reduces the risk of endoscope flooding.
- One hand operated connector and easier endoscope handling with new small, lightweight connector
- 2 Scopes Gastro and colonoscope with Tip on LED
- Video output 1080P (16:9) DVI With 4K / UHD Monitor.
- User interface 7 inch customizable, smartphone-like touchscreen, Twin Mode
- I-scan, virtual chromo endoscopy Digital image enhancement (SE, CE, TE) with Multi-LED.
- Video and audio recording Integrated function, external USB storage device
- Freeze scan Yes
- Digital zoom Up to x 2.0.
- User will select the scopes as per their choice. LED Bright Illuminations
- Dimensions [W x H x D / weight] 380 x 155 x 420 mm / 13 kg

Accessories:

- Standard set of Accessories.

Optional (If any):

PVMS OF MEDICAL EQUIPMENT Refer to the NOTE of Section-III, for the applicability purposes.	
Clinical Specialty	Endoscopy
Generic Name	**RETRO VIEW COLONOSCOPE**
Clinical Purpose	It helps in vivo diagnostic ensures faster detection, easier demarcation and characterization of gastrointestinal lesions to support improved patient outcomes.

TECHNICAL SPECIFICATIONS

- Retroflection of the endoscope tip (Up: 210°) and stability of the insertion tube
- Improved visualization behind folds for increased detection of lesions during colonoscopy with an exceptional close-up view of the mucosa
- Enhanced handling capabilities during long and complex colonoscopy procedures leading to enriched quality outcomes and patient satisfaction.
- Field of view 140° or more
- Direction of view Forward viewing
- Depth of field 3 - 100 mm or better
- Insertion tube diameter: 11.6 mm or less
- Distal end diameter: 10.5 mm or less
- Channel inner diameter: 3.2 mm or more
- Working length: 1680 mm or more
- Angulations: Up 210°, Down 160°, Right 160°, Left 160° or better
- Observation facility for greater contrast of blood vessels and mucosa

Accessories:

- Standard set of Accessories

Optional (If any): Mandatory to quote

02 Biopsy forceps

PVMS OF MEDICAL EQUIPMENT Refer to the NOTE of Section-III, for the applicability purposes.	
Clinical Specialty	Endoscopy
Generic Name	**HD ENDOSCOPIC ULTRASOUND SYSTEM (EUS)**
Clinical Purpose	To diagnose sub-epithelial tumors (SETs) and extra-luminal lesions in the gastrointestinal tract.

TECHNICAL SPECIFICATIONS

Features:

- 360 degrees articulated arm
- Rotating operator console
- High strain
- Carving imaging
- Trapezoidal imaging

Operating modes

- 2D and 3D
- FAM Mode
- AFS
- SWM / ATT
- NE
- Marking Assist
- B-mode with Hi-com & TDHI
- Color Doppler / Color Flow
- Elastography
- Contrast harmonic imaging
- Compound harmonic mode
- Tissue harmonic imaging

Image

- Full / Central Screen, High Definition Output

LCD / LED Display

- High Definition Medical Grade 21" LED / LCD color monitor or larger.

Computing systems

- EUS system with alpha numeric keyboard and built in trackball / touchpad
- 6 inch Touch Screen or better
- Freeze facility with keyboard or endoscope
- Foot switch
- Cine memory: 19,000 or more
- Digital acquisition, storage, and review of complete ultrasound studies
- Built in hard disk / internal memory.
- The studies can be stored on to CD or DVD or USB

- DICOM / Endo base compatible

Measurements & Softwares

- Measurement of parameters
- Patient data management

Note: This HD EUS System can only be purchased at only those EUS Unit(s) where there's already an EUS system and EUS scopes installed, to upgrade EUS System.

Accessories:

- Standard Accessories

Digital Printer

- Medical grade color printer with 10 boxes of paper roll of High Density
- Medical grade B/W printer with 20 paper rolls of high density

Optional (If any):

PVMS OF MEDICAL EQUIPMENT Refer to the NOTE of Section-III, for the applicability purposes.	
Clinical Specialty	Endoscopy
Generic Name	**HD ENDOSCOPIC ULTRASOUND SYSTEM (EUS) – DUAL SCANNING**
Clinical Purpose	To diagnose sub-epithelial tumors (SETs) and extra-luminal lesions in the gastrointestinal tract.

TECHNICAL SPECIFICATIONS

High Resolution Digital Color Ultrasound Scanner for endoscopic Examination and Elastography with miniature probes for small ducts.
Operating modes
2D and 3D
Flow mode and combination, Power Doppler,
Pulse wave Doppler and B-mode,
Image
Full / Central screen
Full HD Display via HD-SDI and DVI ports
Computing systems
Digital EUS system with alpha numeric keyboard and built in trackball
Compatible with EUS miniature probes
Dual scanning Electronic and Mechanical
LCD touch screen 6-inch or more
Freeze facility with key board or endoscope,
foot switch
Electronic Scanning:
Mode B mode, FLOW mode, PW mode
Scanning Radial scanning, curved linear array scanning
Electronic scanning B mode
Transmission frequencies 5, 6, 7.5, 10, 12 MHz
Display range 2, 3, 4, 5, 6, 7, 8, 9, 12 cm
Display processing Rotation Rotatable
Display area Radial scanning: Full circle, bottom sector, top sector, scroll
Curved linear array scanning: Fixed
Direction Normal/Inverse
Cine memory Over 600 frames storable depending on the conditions
Signal processing setting
Gain 20 steps, adjustable.
Contrast 8 steps, adjustable.
STC 21 steps for each of 7 distances, adjustable.
Focus Auto Preset Near, far
Focus setting Focus location adjustable.

Focus number adjustable.
Image adjustment Enhance ON/OFF
Compound ON/OFF
Electronic scanning FLOW mode
Mode COLOR-FLOW mode, POWER-FLOW mode,
H-FLOW mode.
Doppler signal processing setting
Velocity range Maximum 22 steps, adjustable (r 0.6 – r119.3 cm/s) depending on the conditions.
Flow gain 32 steps, adjustable.
Display processing
Display mode Selection of B mode image, superimposed display or dual-screen display is possible.
Electronic scanning PW mode (Pulsed Wave Doppler)
Analysis FFT method
Detectable depth 0 – 120 mm
Maximum detectable velocity ANGLE ADJUST 0q =72.9167 cm/s
ANGLE ADJUST 60q =145.8333 cm/s (5.0 MHZ)
PW mode signal processing setting
Gain 61 steps, adjustable.
Pulse repetition
Frequency Max 20 steps, adjustable (1 – 10 kHz).
Sample length 0.5 – 5.0 mm: 0.5 mm step
5.0 – 15.0 mm: 1.0 mm step
Angle adjust Applicable (±60q).
Wall filter 12 steps
Display processing Baseline shift Applicable
Invert The PW waveform display upside down.
Sweep speed 1, 1.5, 2, 3, 4, 5 s/screen
Display mode B + PW, COLOR + PW, POWER + PW, H-FLOW + PW
Audio output
Volume Adjusts the volume of the Pulse Wave Doppler waveform.
Measurement Distance Possible to measure distance between two points.
Area/circumference Measures area/circumference enclosed by caliper tracing.
PW Measurement
Velocity, Acceleration, Flow volume, Time average
velocity, Ratio-time, Ratio-velocity, Average velocity,
Auto trace is available.
Estimation Volume
(only Mechanical scanning function) Calculates the volume.
Electronic scanning B mode
Image adjustment THE: (Tissue Harmonic Echo) 3 Types, adjustable (OFF, THE-P, or THE-R).
Mode CH-B Mode for viewing the harmonic component from the ultrasound contrast agent using

dedicated B mode images.
CH-COLOR Mode for viewing the harmonic component from
the ultrasound contrast agent by superimposing
Color image on a Fundamental image.
Preset (CH agent type) 2 types, adjustable (Middle or low).
Frequency selection 2 types, adjustable (CH-R or CH-P).
CH-EUS mode signal processing setting
Gain 20 steps, adjustable.
Contrast 8 steps, adjustable (CH-B only).
STC 21 steps for each of 7 distances, adjustable. The settings is common for Fundamental image.
Fundamental image setting
Gain 20 steps, adjustable.
Contrast 8 steps, adjustable.
STC 21 steps for each of 7 distances, adjustable. The settings is common for contrast image.
Display mode Selection of the CH-B or CH-COLOR
Single-screen image or dual-screen display of the fundamental and CH-B or CH-COLOR images.
Movie recording
Image format AVI
saving type GENERAL (for normal movie data) or TIC (for TIC movie data)
Maximum recording time 3 minutes (per one file)
TIC Analysis target modes When the CH-B mode or THE mode is activated in the B mode.
ROI setting Number & Shape Max. 5, Ellipse
Operation Copy, Rotate, Delete, Interpolation, Move, and modify the ROI size.
Review of motion image Review (Forward),
Frame Review (Forward/Backward),
Review Speed (5 steps for each direction),
Move frame (Start Frame / End Frame)
Analysis result Form Display of ROI, Graphs, and Data
Graph display Averaged Intensity, Fitting Curve
Electronic scanning ELST mode (Elastography)
Signal processing setting
STRAIN ADJUST 5 steps, adjustable.
Pressurization state guide
Pressurization bar Pressurization status indication in 7 steps.
Strain graph Time variation of tissue strain is shown in the graph.
Strain graph setting Graph position 2 kinds, adjustable (upper or lower).
Reference line 5 steps, adjustable (width of the reference).
Sweep speed 8 kinds, adjustable (1, 1.5, 2, 3, 4, 6, 8, 10 s).
Sector 5 kinds, adjustable (OFF, 1, 2, 3, 4).
Gain 10 steps, adjustable for the Y-axis scale of strain graph.
Strain ratio measurement The amounts of the strain and their ratio in two areas.

Mechanical scanning function
Mode B mode
Scanning Radial scanning
Usable frequencies C5, C7.5, C12, C20, 7.5, 12, 20 MHz
Display range 2, 3, 4, 6, 9, 12 cm
Display processing Rotation Rotatable.
Display area Full circle, bottom sector, top sector, scroll
Direction Normal/Inverse
Cine memory Maximum 160 frames cine review function
Signal processing setting
Gain 20 steps, adjustable.
Contrast 8 steps, adjustable.
STC 21 steps for each of 7 distances, adjustable.
3D display Provides 3D display by reconstructing multiple
Continuous 2D images acquired from 3D scanning.
MPR display Displays radial display images, helical display images, horizontal helical display images and oblique display images simultaneously during 3D examinations with the screen divided into four.
High Definition Medical Grade 26" LED / LCD color monitor or larger Digital acquisition, storage and review of complete ultrasound studies built in hard disk/Internal memory
the studies can be stored on to CD or DVD or USB DICOM / Endobase compatible
Measurements & Soft wares
Measurement of length angle distance area circumference velocity and volume tissue harmonic imaging
echo endoscopy Ultrasonography (EUS) Contrast harmonic endoscopic imaging compound imaging Elastography.
Programmable patient data management software
Digital Printer
Medical grade color printer with 10 boxes of paper roll of High Density
Medical grade B/W printer with 20 paper rolls of high density

Note: This HD EUS System can only be purchased at only those EUS Unit(s) where there's already an EUS system and EUS scopes installed, to upgrade EUS System.

PVMS OF MEDICAL EQUIPMENT Refer to the NOTE of Section-III, for the applicability purposes.	
Clinical Specialty	**Endoscopy**
Generic Name	**HIGH DEFINITION VIDEO COLONOSCOPE – WIDE FIELD OF VIEW**
Clinical Purpose	Therapeutic colonoscope used for the hemostasis, resection and ablation of benign and malignant disease, decompression, and recanalization of obstructed or dilated bowel, as well as foreign body extraction.

TECHNICAL SPECIFICATIONS

High Definition Video Colonoscope Standard with CCD / CMOS and advanced technological features as below:

Close Focus

One Step Connector

Anti-Blur Function

Photometric Control

Direction of view:	Forward viewing
Wide Field of view:	170° or better
Depth of field:	2 - 100 mm
Distal end diameter:	12.0 mm or less
Insertion tube diameter:	12.0 mm or less
Channel inner diameter:	3.8 mm or more
Working Length:	1690 mm or more
Angulations:	Up 180°, Down 180°, Right 160°, Left 160° or better

Water Jet Function

Manual Adjustable Stiffness (ColoAssist Adjust)

Observation facility for greater contrast of blood vessels and mucosa (BLI, LCI / TXI, RDI)

Must be Compatible with AI System & capable of AI features

Accessories:

- Standard Set of Accessories

Optional (If any): **Mandatory to quote.**

- 02 Biopsy Forceps

PVMS OF MEDICAL EQUIPMENT Refer to the NOTE of Section-III, for the applicability purposes.	
Clinical Specialty	**Endoscopy**
Generic Name	**HIGH DEFINITION VIDEO COLONOSCOPE (PEADS) WITH WIDE FOV**
Clinical Purpose	A small-diameter colonoscope for use in patients with smaller anatomy, such as children and smaller women. It can also help physician's complete procedures rectum-to-cecum in patients with inflammation, obstructions, or colon structures, such as diverticulitis and post-operative adhesions.

TECHNICAL SPECIFICATIONS

High Definition Video Colonoscope (Slim) with CCD / CMOS and advanced technological features as below:

Close Focus

One Step Connector

Anti-Blur Function

Photometric Control

Direction of view:	Forward viewing
Wide Field of view (FOV):	170° or better
Depth of field:	2 - 100 mm
Distal end diameter:	11.1 mm or less
Insertion tube diameter:	11.5 mm or less
Channel inner diameter:	3.2 mm or more
Working Length:	1690 mm or more
Angulations:	Up 180°, Down 160°, Right 160°, Left 160° or better

Water Jet Function

Manual Adjustable Stiffness (ColoAssist Adjust)

Observation facility for greater contrast of blood vessels and mucosa (BLI, LCI / TXI, RDI)

Must be Compatible with AI System & capable of AI features

Accessories:

- Standard Accessories list

Optional (If any): **Mandatory to quote.**

- 02 Biopsy Forceps

PVMS OF MEDICAL EQUIPMENT Refer to the NOTE of Section-III, for the applicability purposes.	
Clinical Specialty	**Endoscopy**
Generic Name	**HIGH DEFINITION VIDEO COLONOSCOPE – PEADS – WITH ZOOM**
Clinical Purpose	A small-diameter colonoscope for use in patients with smaller anatomy, such as children and smaller women. It can also help physician's complete procedures rectum-to-cecum in patients with inflammation, obstructions, or colon structures, such as diverticulitis and post-operative adhesions.

TECHNICAL SPECIFICATIONS

High Definition Magnification Video Colonoscope (Slim) with CCD / CMOS and advanced technological features as below:

Close Focus

One Step Connector or equivalent

85x or more Zoom capability

Direction of view:	Forward viewing
Field of view:	140° or better
Depth of field:	Normal: 3 - 100 mm; Close: 1.5-2.5 mm or better
Distal end diameter:	11.7 mm or less
Insertion tube diameter:	11.8 mm or less
Channel inner diameter:	3.2 mm or more
Working Length:	1680 mm or more
Angulations:	Up 180°, Down 160°, Right 160°, Left 160° or better

Water Jet Function

Manual Adjustable Stiffness (ColoAssist Adjust / RIT)

Observation facility for greater contrast of blood vessels and mucosa (BLI, LCI / TXI, RDI)

Must be Compatible with AI System & capable of AI features

Accessories:

- Standard Accessories list

Optional (If any): **Mandatory to quote.**

- 02 Biopsy Forceps

PVMS OF MEDICAL EQUIPMENT Refer to the NOTE of Section-III, for the applicability purposes.	
Clinical Specialty	Endoscopy
Generic Name	**ULTRASONIC PROBE & DRIVE SYSTEM**
Clinical Purpose	This probe used to diagnose small ducts where normal ultrasound scope cannot be inserted.
TECHNICAL SPECIFICATIONS	
Ultrasonic Probes for small duct with probe drive unit - 2.6 mm or less - 12 MHz or equivalent probe - 2.6 mm or less - 20 MHz or equivalent probe	
Accessories: - Standard Accessories list	
Optional:	

PVMS OF MEDICAL EQUIPMENT Refer to the NOTE of Section-III, for the applicability purposes.	
Clinical Specialty	Endoscopy
Generic Name	**ULTRASONIC LINEAR GASTRO VIDEO SCOPE FORWARD VIEWING**
Clinical Purpose	To Diagnosis Staging of mediastinal lymph nodes and tumors, staging of esophageal lymph nodes and tumors, Metastatic, celiac axis pathologies and esophageal tumors, staging of pancreas tumors and lymph nodes, EUS assisted resection Ablation of mucosal lesions (polyps), Resection of sub-mucosal tumors, Puncture of pancreatic pseudo cysts for drainage, Injection therapy.

TECHNICAL SPECIFICATIONS

Field of View:	120° or better
Direction of View:	Forward viewing
Depth of Field:	3-100mm
Distal End Diameter:	14.6mm or less
Insertion tube diameter	12.8 mm or less
Instrument Channel	3.7 mm or more
Angulations:	UP 180° / DN 90° RT/LT 90°
Working length	1245 mm or more
Display mode:	B-Mode, Color Flow, and Power Flow
Scanning method:	Electronic Curved linear Array
Scanning Direction	Parallel/longitudinal to insertion direction
Frequency	Multi frequency 5-12 MHz or better
Scanning Range:	90° or more
Connecting Method:	Balloon Method/direct contact Air water valve for air and water

Accessories:

- Standard Accessories

Optional (If any):

PVMS OF MEDICAL EQUIPMENT Refer to the NOTE of Section-III, for the applicability purposes.	
Clinical Specialty	**Endoscopy**
Generic Name	**CHOLEDOCHO VIDEO SCOPE**
Clinical Purpose	Cholngioscopy is a procedure in which a flexible tube, called an endoscope, allows the doctor to visualize the inside of the bile ducts. It is used to treat related medical conditions, such as removal of bile duct stones
TECHNICAL SPECIFICATIONS	
By the size of the available 1.2-mm working channel. Devices which fit in this narrow-working channel include the 1.9-Fr electrohydraulic lithotripsy probe and holmium yttrium aluminum garnet (YAG) laser lithotripsy... Various therapeutic interventions such as therapeutic drug injection, tumor resection , stone extraction, migrated stent removal, argon plasma coagulation (APC), and photodynamic therapy (PDT), are feasible Angle of view, degrees 80 Observed depth, 1.5–20 mm Outer diameter distal end 3.3 mm Insertion end 3.5 mm Bending section, degrees Up / Down: 70 / 70 Working length, 1920 mm or more Working channel diameter, 1.2 mm Image-enhanced endoscopy NBI Complete with video system light source	
Accessories: - Standard Set of Accessories.	
Optional (If any):	

PVMS OF MEDICAL EQUIPMENT Refer to the NOTE of Section-III, for the applicability purposes.	
Clinical Specialty	**Endoscopy**
Generic Name	**NAVIGATION / SCOPE GUIDE SYSTEM FOR COLONOSCOPY**
Clinical Purpose	The next generation Navigation system technology designed to provide a true 3D live representation of the colonoscope shape and position inside the patient's bowel tract.

TECHNICAL SPECIFICATIONS

Navigation / Scope Guide System

True 3D representation of the colonoscope for an accurate insertion tracking and effective loop management.

Image rotation on horizontal axis or more

Image rotation on vertical axis or more

Split Screen for simultaneous view

Real time representation of the scope shape and position for a dynamic traceability and handling control.

Video Output: DVI / HDSI /XGA / SD-SDI

Keyboard for data handling

Remote for control

Length markers/ hand Coil along the colonoscope help to understand the insertion length and those areas of interest during the procedure.

External Position Sensor.

Procuring Agency to Specify from below Scopes.

Video Colonoscope – (Compatible with Navigation/ Scope Guide System)

High Definition Video Colonoscope Adult CCD/CMOS advance features as below:

Direction of View	Forward
Field of View	140 Degree or more
Depth of Field	2-100 mm
Angulation.	Up 180, Down 180, Right 160, Left 160 or more.
Distal end Diameter	11.7 mm or less
Insertion Tube	11.8 mm or less
Instrument Channel	3.2 mm or more
Working Length	1680 mm

Should be Navigation/ Scope Guide Compatible

Should have I-Flex / Gradual stiffness / Gradual Decreases Flexibility / RIT

Video Colonoscope – Adult (compatible with Navigation/ Scope Guide **System)**

High Definition Video Colonoscope Adult CCD/CMOS advance features as below:

Direction of View	Forward
Field of View	140 Degree or more
Depth of Field	5-100 mm or better
Angulation.	Up 180, Down 180, Right 160, Left 160 or more.
Distal end Diameter	13.2 mm or less

Insertion Tube	13.2 mm or less
Instrument Channel	3.7 mm or more
Working Length	1680 mm
Should be Navigation/ Scope Guide Compatible	
Should have I-Flex / Gradual stiffness / Gradual Decreases Flexibility / RIT/ Adjustable Flexibility	
Accessories:	
- Standard Set of Accessories	
Optional (If any):	

PVMS OF MEDICAL EQUIPMENT Refer to the NOTE of Section-III, for the applicability purposes.	
Clinical Specialty	Endoscopy
Generic Name	**ULTRA HIGH DEFINITION VIDEO PROCESSOR (4K)**
Clinical Purpose	It helps in vivo diagnostic ensures faster detection, easier demarcation, and characterization of gastrointestinal lesions to support improved patient outcomes.

TECHNICAL SPECIFICATIONS

- Next Generation Video Processor System
- Ultra HD or Full 4K Video Processor System with the following latest technological features:
- Touch screen display with selectable functions
- Must compatible with Artificial Intelligence Module
- Compatible with latest EUS Processor System
- Compatible with scope guide function
- Digital signal output 12G-SDI and 3G-SDI and HD-SDI and SD-SDI
- Analog signal output VBS composite and Y/C; simultaneous outputs possible
- Full 4K (3840x2160 min resolution)
- Iris Mode: Avg, Peak, Auto
- Color Adjustment, Structure emphasis,
- Electronic Zoom
- Contrast: 2-Steps or more
- Freeze screen display
- Patient, doctors & clinical procedures list storage facility
- Programmable functions through endoscope switches
- Image storage facility in TIFF, JPEG formats
- PIP and PoP Function, Network Function
- On screen keyboard for data handling
- Capable for visual enhancement and differentiation of vessels and Capillaries (TXI, RDI, Bi-MAC)
- Auto florescence imaging
- Backward compatibility with previous versions of video scopes from the same manufacturer
- Complete with cables and connections
- Touch panel Brightness 10 steps
- Color tone adjustment Red/ Blue/ Chroma adjustment ±8 steps
- Image enhancement 8 levels
- Light Source with 5-LED lights or more
- Separate or built in advanced LED light Source
- 5-LED lights or more
- High intensity 5 or more LED lights
- Longer life with low-energy consumption

- Lamp cooling method: Forced air cooling
- Automatic & manual Brightness adjustment
- High intensity mode
- Memorization of set-values
- Brightness adjustment method LED drive current control
- Exposure 17 steps
- Brightness mode Auto
- Pump Diaphragm type pump
- Pressure switching 4-level available (OFF, low, medium, high)
- Water feeding Method
- Can be supplied from the distal end of the endoscope
- in combination with a flushing pump
- Air pump – Hi, Mid, Low, Off
- Protection against electric shock
- Lamp cooling method: Forced air cooling
- Water Tank must be supplied along-with the light source

PVMS OF MEDICAL EQUIPMENT Refer to the note of Section-III, for the applicability purposes.	
Clinical Specialty	Endoscopy
Generic Name	**VIDEO CYTOSCOPE FOR UPPER GI**
Clinical Purpose	Cytological observation of the superficial mucosal layer
TECHNICAL SPECIFICATIONS	
Ultra-high magnification of up to 520x enables observation at the microscopic level Improve diagnostic accuracy Must equipped with a manual zoom mechanism like a conventional magnifying scope Switching from normal view to magnifying observation Magnification up to 520x for lesion assessment Slim diameter of 9.7 mm Field of view 140° Direction of view 0° (forward viewing) Depth of field Magnification ratio 520x Enlarged distal end Insertion tube outer diameter 9.6 mm Working length 1,030 Channel inner diameter 2.2 Minimum visible distance 4 mm Auxiliary Water Up: 210° ; Down: 90° Up: 100° ; Down: 100° Total Length 1,350 Complete with compatible video processor, light and monitor	
Accessories:	
Optional (If any): **Mandatory to quote** 02 Biopsy forceps	

PVMS OF MEDICAL EQUIPMENT Refer to the note of Section-III, for the applicability purposes.	
Clinical Specialty	Endoscopy
Generic Name	**VIDEO CYTOSCOPE FOR LOWER GI**
Clinical Purpose	Cytological observation of the superficial mucosal layer
TECHNICAL SPECIFICATIONS	
Ultra-high magnification of up to 520x enables observation at the microscopic level Improve diagnostic accuracy Must equipped with a manual zoom mechanism like a conventional magnifying scope Switching from normal view to magnifying observation Magnification upto 520x for lesion assessment Slim diameter of 12.8 mm Field of view 140° Direction of view 0° (forward viewing) Depth of field Magnification ratio 520× Enlarged distal end Insertion tube outer diameter 12.8 mm Working length 1,330 Channel inner diameter 3.2 Auxiliary Water Up: 180° ; Down: 180° Up: 160° ; Down: 160° Total Length 1,665 Complete with compatible video processor, light and monitor	
Accessories:	
Optional (If any): **Mandatory to quote** 02 Biopsy forceps	

PVMS of Medical Equipment Refer to the NOTE of Section-III, for the applicability purposes.	
Clinical Specialty	Endoscopy
Generic Name	**MOBILE FLOUROSCOPY SYSTEM**
Clinical Purpose	To be used in ERCP Procedures.
TECHNICAL SPECIFICATIONS	

Generator

Radiological Features

Generator Power 3,5 kW; kV Range 40-110 kV
Max mA on one-shot fluoroscopy 10 mA; mAs Range 1-250 mAs
Max Monobloc Current (piloted) 65 mA Radiography– 12 mA Boosted
Total Filtration >2,7 mm Al
Additional Filtration Not removable – 1mm Al

Monobloc

Monobloc Type E 40 HF
Ripple Monobloc at Max Power 1%
Max Current of the Monobloc (fluoroscopy) 5 mA - 7 mA (pulsed) – 10 mA One Shot
Max Current of the Monobloc (radiography) 65 mA
Focuses dimension Small Focus 0,5x0,5 mm; Large Focus 1,5x1,5 mm
Thermal Capacity of the Monobloc 832 kJ - 1100 kHU
Continuous Thermal Dissipation of the Monobloc 60 W
Available Thermal Capacity (X-Ray) 600 kJ
Additional Filtration Not removable – 1mm Al

Tube

Insert Type CEI OX/110-5
Focuses dimension 0,5 – 1,5 mm
Type of tube Fixed Anode
Anode speed N/A
Anodic Angle 12°
Maximum Thermal Capacity of the Insert 30 kJ - 40 kHU
Maximum Capacity Dissipation of the Insert 270 W

Power features

Main system power supply voltage Single Phase, 230 Vac +/-10%
Frequency 50/60 Hz
Maximum Current Absorbed In fluoroscopy 6 A – 230 Vac Fluoro Pulsed
In Radiography 22 A – 230 Vac Radio Pulsed
Line compensation Automatic
Line resistance 0,4 ohm
Collimator characteristics
Shutters 2 pairs of mobile leaded shutters with variable opening and rotation
Dimensions 210 x 98 x 94 mm
Iris Control from console, with adjustable opening to the maximum allowed depending on the Image Intensifier fields.

Image Intensifier characteristics

Useful Entrance Field Size 215 mm / 160 mm / 120mm
Output Image Diameter 20 mm ± 0,5 mm 20 m, 66 lp/cm

Contrast Ratio on large area 25:1 23:1, 25:1
DQE Detective Quantum Efficiency 65% (IEC Standard)
Conversion Factor (Gx) 240 Cd/m²/mR
Grid characteristics
Grid Ratio 8:1
Grid shutters 40 L/cm (103 L/inch)
Focusing of the Grid 90 cm
CCD Camera Thales 1024 x 1024
XRII Output Diameter 25,2 mm
Image resolution 1000 x 1000 Pixels
Digital Video Output 12 bits
Maximum frame speed 30 fps
Minimum exposure time 33 ms @ 1000x1000
Sensitivity Motorized Lens >64 LSB/Cd/m²
Manual lens >18 LSB/Cd/m²
MTF Motorized Lens ≥ 50%
Manual Lens ≥ 40%
Iris Aperture Range Motorized Lens: from F/1.5 to F/11
Manual Lens: from F/2.8 to F/11
Fluoroscopy 25 images per second 1024x 1024 x 12 bit
RTP
- Recursive filter and movement detection
- Pulsed Fluoroscopy
- Acquisition rate 1,3,6,12, 25 image/sec
- Electronic rotation with 1° step
- Horizontal and vertical inversion
- Brightness and contrast
- Grey scale inversion
- Maximum opacity fluoroscopy acquisition
- Real time subtraction with auto/manual mask
- Storage on disk up to 25 images per second
- Virtual collimators

Post Processing
- Electronic rotation with 1° step
- Horizontal and vertical inversion
- Grey scale inversion
- Spatial filters (edge enhancement)
- Cine loop
- Electronic collimators
- Shifting pixels
- Electronic Zoom
- Image subtraction
- Land marking
- Overview 4-9-16 images
- Print on Windows USB2 printers
- Storage examination on removable drive (USB2 Pen drive) in BMP

Operational Features
User Interface

Display touch screen (also working with work gloves) backlit and high contrast for the insertion of all parameters and for the display of any error messages or system issues.
Radiography 2 Points technique (kV – mAs)
Fluoroscopy
• "Automatic" Technique (0 Points) with automatic control on kV and mA
• "Manual" Technique (1 Point) with manual control on kV and Ma
Radiography Command Double click manual with extensible spiral cable
Fluoroscopy Command Pedal footswitch
I.I. Field Selection Electronic zoom selection according to the number of fields of the Image Intensifier
Safety
- Filament current
- mA min and mA max
- Max Exposure Time
- Max Temperature of the monobloc
- Counting monobloc thermal units
- Timer with RX stop every 5 minutes (up to 99 minutes)
- max kV, min kV, max kV, max I
- Anode Rotation
- Microprocessor auto test

Mechanical characteristics
Vertical Movement (Motorized) 450 mm
Horizontal Movement 210 mm
Wig – Wag ± 12°
Lateral Rotation ± 270°
Orbital movement 130° (90°+ 40°)
S.I.D. 1010 mm
Depth 659 mm
Free Space 740 mm
Movement Manual with steering rear wheels and parking position.
Rotating front wheel.
Length Min/Max 2018 ÷ 2463 mm
Max Width 830 mm
Height Min/Max 1827 ÷ 2277 mm
Weight * 275 Kg

Accessories:
Standard Accessories

Optional (If any):

PVMS OF MEDICAL EQUIPMENT Refer to the NOTE of Section-III, for the applicability purposes.	
Clinical Specialty	Endoscopy
Generic Name	**AUTO LEAKAGE TESTER**
Clinical Purpose	For auto leakage testing
TECHNICAL SPECIFICATIONS	
• Default pressure setting, automated pressurization cycle, and air release reduce the risk for human error and potential risky variability within the reprocessing process. • No need to have large space available in the reprocessing room, due to the handy format of SHA-P6. With the re-chargeable battery, the automatic leakage tester is usable in several stations without power connection need • Lowers overall repair costs, improves scope utilization and prevents downtime as a result of the optimized, automated process capability. • Built - in packaged lithium battery • Battery capacity2,600 mAh • Mode of Operation: Continuous Operation • Pressurization Automatic (air pump) • Air release: Automatic rapid air release valve • Displayed pressure range0 to 40 kPa (0 to 5.80 psl) • Pressurization setting range20 to 30 kPa (in increments of 1kPa) (2.90 to 4.35 psl) • Electric shock protection Degree of Electric shock protection • Internal power supply equipment and Class II Equipment Type BF (Body Floating)Electro Magnetic CompatibilityIEC60601 - 1 - 2 : 2007Electrical SafetyIEC60601 - 1 : 2005 + A1 : 2012IP ClassificationIP22	
Accessories:	
Optional (If any):	

PVMS OF MEDICAL EQUIPMENT Refer to the NOTE of Section-III, for the applicability purposes.	
Clinical Specialty	Endoscopy
Generic Name	**MOTORIZED SMALL INTESTINAL VIDEOSCOPE**
Clinical Purpose	This is achieved via an integrated motor, which rotates the single-use over tube that is equipped with soft spiral-shaped fins that gently follow the mucosa.

TECHNICAL SPECIFICATIONS

Small-Bowel Entero Scope for covering the entire small intestine
With advanced technological features as below:

Direction of view:	Forward viewing
Field of view	140° or equivalent or better
Depth of field	3 - 100 mm or equivalent or better
Distal end diameter	11.3 mm or equivalent or better
Insertion tube diameter	11.5 mm or equivalent or better
Channel inner diameter	3.2 mm or equivalent or better
Working Length	1680 or equivalent or better
Total Length	2035 mm or equivalent or better
Angulations:	Up 180°, Down 180°; Right 160°, Left 160° or better

Motorized Spiral Enteroscopy
Allows whole-length of small intestine to be visualized
Efficient hand control & automatic pressure control
Great stability of position and smooth insertion capability
Observation facility for greater contrast of blood vessels and mucosa
Should allow access to reach deep into the small intestine by pleating the small bowel onto the Enteroscope using a spiral segment
Should have integrated motor on the scope that
Can be controlled by the user with the help of a footswitch
Should have High-Definition Image Quality with Narrow Band Imaging capability
All components of the Spiral Enteroscopy System should be latex free
Should be equipped with water jet function

Accessories:

Balloon/Rotation Control Unit:
Set Pressure of Balloon: ±5Kpa or more
Over tube x 50

Optional (If any): **Mandatory to quote**
02 Biopsy forceps

SPECIALIZED HEALTH CARE AND MEDICAL EDUCATION DEPARTMENT

GOVERNMENT OF THE PUNJAB

Health Department

PRODUCT VOCABULARY MEDICAL STORE (PVMS) OF CARDIAC SURGERY EQUIPMENT

Volume - II , 2021

Contents

PVMS OF Medical Equipment	
Clinical Specialty	Cardiac Surgery
Generic Name	**Heart Lung Machine**
Clinical Purpose	A heart-lung machine—also called a cardiopulmonary bypass machine—is a device that takes over the function of the body's heart and lungs during heart surgery. The machine maintains the circulation of blood and the oxygen content of the body, allowing the cardiac surgery team to operate on a heart. When the surgery is complete, the heart is restarted and the heart-lung machine is disconnected.

TECHNICAL SPECIFICATIONS

- 05 completely modular Pumps on console/MAST with all modular parameters and at least two Pumps should be on MAST
- 04 single Roller Pumps and 01 Cardioplegia Pump
- Pressure module
- Temperature module
- Monitor interface module
- Power supply module
- Entire system should have a battery backup.
- Level sensor
- Ultrasonic Bubble detector
- Flexible Light Lamp
- Mechanical /Electronic Gas blender
- Cardioplegia Monitoring Unit
- System Control Panel
- Venous occluding clamp.
- Heart Lung machine should have modular system.
- Smooth stainless steel, painted metal and aluminum.
- Switch over from main power to battery backup should be automatic and immediate.
- Battery Unit should be built up in console or 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.
- 24V operated socket for all pumps to avoid risk.
- Should have hand crank facility as a safety feature with each pump

- All the Pumps should have facility of pulsatile mode

System Control Monitor

Should display following components.

- Pulsatile operation display.
- Pressure monitoring display.
- Temperature monitoring display.
- Timer system display.
- Battery voltage display.
- Safety buttons.
- Alarm for shut down for any pump.

Cardioplegia Monitoring Unit

- It should display Volume ratio, timer, temperature, and pressure of full control of independent cardioplegia line.
- Master follower function and pump to stop.

Single Roller Pump

- Console Pumps should have a compact arrangement and a universal connection.
- Monitoring flow rates in LPM & RPM should digitally display on the pump or equivalent.
- Pump should be peristaltic for durability and convenience of handling.
- Roller pump should have a self-diagnostic circuit with provision to detect and display critical alarm conditions
- Each individual roller pump should be capable of running independently.
- Each Pump should operate on 24 V.
- Roller Pump Range: 0-250 RPM
- Display of all pump condition on pump.
- Calibrations preset for ¼, 3/8 & ½ tubing.
- Tubing inserts of all standard sizes.
- It should have reverse flow capability.

Pressure Monitor

- Should be capable of monitoring and displaying six Pressures.

- Along with necessary pressure transducers Kit, cables and domes reusable, with accurate digital display and alarm facilities- audio and visual.
- It should have trend indicator and trend readouts.
- Pole mounts for transducer Kits.

Temperature Monitor

- 04 temperature displays on Control panel for patient monitoring and cardioplegia monitoring with digital display in Celsius.
- It should have trend indicator and trend readouts.

Air –Emboli Module.

Level Sensor

- With alarm settings.
- Should be able to provide both alerts for audible and visual alarms for low blood level.
- Level sensor pads Qty: 100 pcs

Air Bubble Detector

- It should be ultrasonic in nature and have the ability to detect micro bubbles
- Bar LEDs/graphical or pictorial, sensor fault, override facility.
- Sensor should be compatible with all tubing sizes.

Time Monitor

- Minimum 3 time displays.
- With stop, reset and start function

Accessories:

System should be with all complete accessories.

- Arterial Flow Sensor
- Electronic venous occluder
- An original copy of complete Service Manual from the manufacturer with a soft copy.

Optional: (Procuring agency will select according to its requirement)

1. **Online /Inline Arterial & Venous Line Monitoring**

   (In case of Inline Monitoring, supplier will be responsible to supply 1500 complete disposable kits @ 300 Kits per year free of cost.)

   Technical Specifications

   - LCD display of 6" or better touch screen monitor

   Monitoring of Arterial Line:

   - Measurement method for partial oxygen
   - Measurement method for temperature
   - Measurement of Hemoglobin, Arterial partial pressure of oxygen, Arterial temperature.

   Monitoring venous line:

   - Measurement method for partial oxygen
   - Measurement method for temperature.
   - Measurement of Venous line, Hemoglobin, Hematocrit, SvO_2

   Accessories:

   - Venous probe
   - Arterial probe
   - Venous temperature sensor
   - Arterial Temperature sensor
   - system should be complete with all accessories

2. **Second Bubble sensor**
3. **Second Level sensor**

PVMS of MEDICAL EQUIPMENT	
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 should be used as a fully independent stand-alone unit and can be used as part of heart Lung machine.
- Flow and bubble measuring function must be integral part of the Console.
- Console should have triple power supplies: mains, Heart Lung, or 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: 0-8 L/min.
- Mains power inlet cable.
- Push and turn control knob.

Accessories

- System should be complete with all accessories.
- An original copy of “Complete Service Manual” from the manufacturer with a soft copy.

Optional (If any):

PVMS of MEDICAL EQUIPMENT	
Clinical Specialty	Cardiac Surgery
Generic Name	**Hypo-Hyperthermia Machine**
Clinical Purpose	Hypo-Hyperthermia unit is used for temperature control (Hot and Cold) of patient during cardiac surgery.

TECHNICAL SPECIFICATIONS

- The Hypo-hyperthermia unit designed to supply temperature-controlled water to oxygenator, heat exchangers, cooling blankets and cardioplegia.
- The feed water temperature is selected on a temperature controller in the range of 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 three-way motor valve.
- Selection of water from a cooling or heating vessel as per requirement is available.
- 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 is ±0.5°C
- Initial Cooling Capacity is 2100 KJ/h (500Kcal/h)
- Continuous cooling cap 2800KJ/h (670 Kcal/h)
- Circulating system: Pump
- Flow capacity in total is 10-16 liters/min
- Disinfection mechanism for internal water to prevent bacterial growth with Patient and Cardioplegia circuit/tank
- It should have the facility of emptying of pipes.

Accessories

- System should be complete with all accessories.
- An original copy of “Complete Service Manual” from the manufacturer with a soft copy.

Optional (If any):

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PVMS OF MEDICAL EQUIPMENT	
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

- For warming of blood bags
- Minimum three to four bags capacity
- Temperature setting: +37^{o}C to +42^{o}C
- Microprocessor controlled unit
- Blood warmer
- Voltage: 220 V, 50 Hz
- Visual and audible alarm for low and high temperature

Accessories:

- Complete with standard accessories
- An original copy of “Complete Service Manual” from the manufacturer with a soft copy.

Optional (if any):

PVMS OF MEDICAL EQUIPMENT	
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

- Microprocessor controlled unit for reliable transfusion and infusion for intra and post-operative hypothermia.
- It should be an open system suitable for any standard IV sets.
- Dry warming system.
- On line warming with tubing.
- Pre-selected temperature settings over the range 37 ^{O}C to 40 ^{O}C.
- Indications/ display for different temperatures.
- Blood warming device with safety cut out at 41/42 ^{O}C.
- Visual and audible alarm for low and high temperature.

Accessories:

- Complete with standard accessories
- An original copy of “Complete Service Manual” from the manufacturer with a soft copy.

Optional (if any):

PVMS of MEDICAL EQUIPMENT	
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/3CCD Type Compatible for Cardiac Harvesting Latest and advanced kit.
- Full HD Camera system with Latest Chip or Sensor.
- CMOS/3CCD technology for brilliant image display.
- 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:

- Camera Resolution: 1920x1080 Pixel
- Buttons on Camera Head: with 5 FUNCTIONS
- With Digital and optical zoom
- Length Camera Cable: 4 m minimum

Harvester Cannula:

Harvesting Cannula should be complete with all workable accessories.

Harvester Endoscope:

- 5mm or more extended length Telescope with Dissection Tip
- Target focus quality
- 0 Degree Straight forward.

Endoscopic Harvester Power Generator:

- Extension Cable Connector
- Power Cord Connector
- Power Setting Knob
- LED Power-On Indicator
- Hanger
- Harvester Extension cable
- Harvester Adapter

Light source :

- Xenon 300 watts or more/LED
- Life span 500 hours on continuous use
- Light Guide Cable. 1 pcs.
- Color temperature 6000 Kelvin light intensity should be continuously adjustable

High flow insufflator:

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

- High-definition medical monitor with Bright LED Backlight
- Disposables kit Harvester : 50x Qty included
- Harvester Cannula with Traction device, Harvesting Bisector (Three in one Cutting, coagulation, and dissection), Trocar Cannulas, syringes.

Accessories:

- System should be complete with all workable accessories.
- An original copy of “Complete Service Manual” from the manufacturer with a soft copy.

Optional (if any):

PVMS OF MEDICAL EQUIPMENT	
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
- Cuvette based technology and be able to work at low blood volumes.
- Data storage for at-least 300 samples
- Quality Control Check
- Result printing capability
- Internal temperature verification

Accessories:

- Complete with at least 300 cartridge or more.
- An original copy of “Complete Service Manual” from the manufacturer with a soft copy.

Optional (if any):

- Integrated barcode reader

PVMS OF MEDICAL EQUIPMENT	
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
- An original copy of “Complete Service Manual” from the manufacturer with a soft copy.

Optional (if any):

Alligator Clamp

PVMS OF MEDICAL EQUIPMENT	
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. It reduces hypothermia during surgical procedures.

TECHNICAL SPECIFICATIONS

- Microprocessor controlled patient warming system for prevention of hypothermia.
- Temperature control range of 30 – 42 ^{o}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 applications.
- Complete system with filters.
- Automatic stop in case of overheating.
- Coupling for different type of blankets
- Blankets should be disposable
- 220V, 50Hz operation

Accessories:

- 500 disposable blankets with each unit for adults and peads.
- An original copy of “Complete Service Manual” from the manufacturer with a soft copy.
- Any other as per requirement

Optional (if any):

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Cardiac Surgery
Generic Name	**Hemodynamic Monitor (Non-invasive or Less Invasive Advance Hemodynamic Monitoring)**
Clinical Purpose	Advance Hemodynamic monitoring with Non-invasive/Less invasive measurement of cardiac output and its determinants (pre load, afterload, contractility) as well as the quantification of pulmonary oedema

TECHNICAL SEPECIFICATIONS

- Non-invasive or Less invasive hemodynamics monitoring of the cardiac output (CO) and other hemodynamic parameters.
- Determination of preload volume and diagnosis of pulmonary oedema/Thoracic fluid content
- Afterload, contractility and volume responsiveness
- Cardiac output and stroke volume
- Stroke Volume (SV)
- Stroke Volume Variation (SVV)
- Cardiac Output (CO)
- Systemic Vascular Resistance (SVR)
- Left Ventricular Contractility
- CPI (Cardiac performance index)
- DO_2 (Delivered Oxygen) Calculated
- Systolic Time Ratio
- AC input power (220V, 50 Hz)
- At least 20 minutes battery backup or for Non-invasive hemodynamic Monitor and at least 20 minutes battery backup or Online UPS for Less Invasive Hemodynamic monitor.
- Wide high resolution Color screen/Touch screen or touch buttons
- At least 50 Disposable Kits with each Non-invasive or Less invasive hemodynamics monitor.
- 220V, 50Hz operation.

Accessories:

- Complete with all standard accessories
- An original copy of “Complete Service Manual” from the manufacturer with a soft copy.

Optional (if any):

PVMS OF MEDICAL EQUIPMENT	
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
- Light weight 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 capable for multiple surgeries.
- The Saw must be easily sterilizable by autoclaving and plasma sterilization.
- It should have Battery charger for changing indications of the batteries
- Sterilization container system with basket including fixing devices for accessories and saw hand piece
- 50 x Sternum Saw blades
- Battery will be replaced free of charge during warranty period

Accessories:

- Complete with all standard accessories
- An original copy of “Complete Service Manual” from the manufacturer with a soft copy.

Optional (if any):

One Oscillating/Redo Saw Hand piece (To be decided by the Procuring agency)

PVMS OF MEDICAL EQUIPMENT	
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
- Light weight and handy. Keyless saw blade coupling
- May have even weight distribution for ideal balance
- Connecting Reusable Pipe and hand piece.
- The Saw connecting pipe and hand piece must be easily sterilizable by autoclaving and plasma sterilization.
- Sterilization container system with basket including fixing devices for accessories and saw hand piece
- 50 x Sternum Saw Blades

Accessories:

- Complete with all standard accessories
- An original copy of “Complete Service Manual” from the manufacturer with a soft copy.

Optional (if any):

One Oscillating/Redo Saw Hand piece (To be decided by the Procuring agency)

PVMS OF MEDICAL EQUIPMENT	
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.
- Light weight and handy. Keyless saw blade coupling
- May have even weight distribution for ideal balance
- Water proof Foot control paddle or trigger control, connecting cable for hand piece
- The Saw cable and hand piece must be easily sterilizable by autoclaving and plasma sterilization.
- Sterilization container system with basket including fixing devices for accessories and saw hand piece
- 50x Sternum Saw blades

Accessories:

- Complete with all standard accessories
- An original copy of “Complete Service Manual” from the manufacturer with a soft copy.

Optional (if any):

One Oscillating/Redo Saw Hand piece (To be decided by the Procuring agency)

PVMS OF MEDICAL EQUIPMENT	
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 surgical 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
- An original copy of “Complete Service Manual” from the manufacturer with a soft copy.

Optional (if any):

PVMS OF MEDICAL EQUIPMENT	
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 • An original copy of “Complete Service Manual” from the manufacturer with a soft copy.	
Optional (if any):	

PVMS OF MEDICAL EQUIPMENT	
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 hemodynamics. • Stabilization Systems should provide surgical access to and exposure of coronary arteries.	
Accessories: • Complete with all standard accessories • An original copy of “Complete Service Manual” from the manufacturer with a soft copy.	
Optional (if any):	

PVMS OF MEDICAL EQUIPMENT	
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 screen for display of result
- Throughput : 24-30 or more sample per hour
- Sample volume should be ≤ 120 µl
- Storage memory for a minimum of 60 results or more
- Easy 2 point calibration
- Calibration history at least 24 hours
- Easy changing access to the electrodes and solutions/reagents
- Automatic sample recognition and sampling
- Possibility of upgrade data management
- Sampling techniques –whole blood
- Operate at 220V AC, 50 Hz

Accessories:

- Complete with all standard accessories
- Built-in or external Laser Printer
- Imported compatible Sine Wave UPS for back up of at least 30 minutes(Emerson, Liebert, Chloride, MGE, APC or equivalent)
- An original copy of “Complete Service Manual” from the manufacturer with a soft copy.

Optional (if any):

PVMS OF MEDICAL EQUIPMENT	
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

- The equipment should be complete system equipped with all workable necessary accessories.
- Automatically delivers consistently high-quality blood product case after case.
- Must Have HTC of washed product 60% or more
- Auto start Function
- Washing Program 2-3.
- Heparin Removal 95% or more.
- Free Hb 83% or more.
- Potassium removal 95% or more.
- Albumin removal 92%-95%
- Fat removal at least 95% or more
- 6'' or more coloured touch screen
- Waste Bag Volume Alarm
- Integrated vacuum regulator with low noise level.
- Single or Multiple Bowl sizes for all types of patients and adaptable program.
- Centrifuge cleaning program should be automatic.
- Should store patient record and USB Port for data download.
- Must have IV Pole for saline wash volume.
- Should have dedicated Emergency button to avoid any critical situation.

Accessories:

- System should be complete with all standard accessories.
- An original copy of "Complete Service Manual" from the manufacturer with a soft copy.

Optional: (If any)

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Cardiac Surgery
Generic Name	**Cardioblate Surgical Ablation System**
Clinical Purpose	Cardioblate Surgical Ablation Systems is a medical device in which electrical conduction system of the heart, tumor or other dysfunctional tissue is ablated using the heat generated from medium frequency alternating current.

TECHNICAL SPECIFICATIONS

- The cardioblate irrigated radiofrequency device portfolio puts surgeons in control of surgical atrial fibrillation (AF) procedures
- Uniquely malleable devices enhance maneuverability, placement and visualization for easier ablation around pulmonary veins and upon atrial tissue
- Use IRF devices for sternotomy or minimally invasive approaches
- Create quick cardiac lesions that achieve reliable, reproducible conduction block
- Bipolar generator algorithm adapts energy delivery and confirms transmurality
- Use bipolar devices for pulmonary vein isolation upon a beating heart

Accessories:

- Complete with all standard accessories
- An original copy of “Complete Service Manual” from the manufacturer with a soft copy.

Optional (if any)**:**

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Cardiac Surgery
Generic Name	**ECMO (Extra Corporeal Membrane Oxygenation) System**
Clinical Purpose	ECMO stands for Extracorporeal Membrane Oxygenation. The ECMO machine is similar to the heart-lung by-pass machine used in open-heart surgery. It pumps and oxygenates a patient's blood outside the body, allowing the heart and lungs to rest. When you are connected to an ECMO, blood flows through tubing to an artificial lung in the machine that adds oxygen and takes out carbon dioxide; then the blood is warmed to body temperature and pumped back into your body.

TECHNICAL SPECIFICATIONS

- Optimal for (Extra corporeal membrane oxygenation) and (Extra Corporeal Life Support) therapy with 30 days FDA/CE approval for Oxygenators at least or better.
- Complete system solution for long term support of heart and lung function in adults, pediatrics and infants.
- Single pump module for adults, pediatrics and infants.
- Minimally invasive perfusion system for on-pump CABG surgery, full support for heart and gas exchange.
- Respiratory failure without cardiac impairment e.g. ARDS, bridge to lung transplant, support of gas exchange.
- Long term VAD with oxygenation possibility support of heart and lungs.
- Severe respiratory failure: e.g. ARDS; severe COPD (Chronic Obstructive Pulmonary Disease), extracorporeal CO2 removal enables protective ventilation, support of gas exchange.

Technical Data:

- Unit should be complete with Motor speed control and pulsatile flow control.
- LCD Touch screen 5” or more, Built-in or detachable.
- Flow sensor with integrated bubble sensor or equivalent.
- Four Pressure Sensors External Or Better
- Three internal pressure sensors or equivalent.
- Two external or two internal temperature sensors or equivalent
- Venous blood oxygenated saturation (SVO2)
- Level sensor should be a part of the system or equivalent.

- Battery backup up to 90 minutes built-in or better.
- Protection with splash, drips and defibrillators CE / FDA approval.
- USB port for a memory stick permits data export.
- Night screen capability.
- Zero flow control.
- Hemoglobin
- Hematocrit
- Arterial blood temperature
- Four external pressure sensors
- USB port for a memory stick permits data export.
- Ward call should be integrated.
- Patient monitoring system should be connected for recording an ECG signal.
- Lock of display and rotary knob

Heater Unit

- Heater unit should have accurate flow, reliable temperature control.
- Set temperature range: 33 – 39 ^{o}C or better.
- Pump capacity: 10 W (0.16 or more pressure bar), 16L/min or better.

Console

- Data interface USB and for external connection of recording.
- Light weight and compact system.
- Safety alarm for high temperature and ward call alarm or equivalent
- Easy transportability.
- Display air, oxygen, carbon dioxide and FiO_2 capable of delivering FiO_2 21 – 100%.

Accessories:

- Infusion pole
- Emergency drive with complete system.
- Gas blender (Mechanical)
- Gas bottle holder 2x Qty
- ECMO-CART (From same manufacturer) with medical isolating transformer, imported from same manufacturer to support component of system as per international standard.

• An original copy of “Complete Service Manual” from the manufacturer with a soft copy.
Optional (If any):

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Cardiac Surgery
Generic Name	**Transit Time Flow Meter**
Clinical Purpose	To verify increased blood flow to an ischemic myocardium during bypass surgery. The system shows stable and accurate real time flow curves and correlates with ECG for diastolic filling pattern verification, automatic validation for measurement reliability with the facility of permanent documentation in patient chart along with Doppler velocity measurement and for control enabling planning, navigation and verification throughout CABG procedures, in order to reduce risk of stroke, myocardial infarction, early graft failure and recurrent angina of the operated patient.

TECHNICAL SPECIFICATIONS

- The system should have 4 channels transit time flow meter, 1 doppler channel, two pressure channels and 2 ECG/AUX channels and a printer.
- It should be trolley based for mobility.
- Monitor should be TFT/LCD Touch Screen, rotatable and 19 inch or above.
- The system should be computerized, Windows based with high end microprocessor, RAM and Hard Disk and have USB/parallel port for printer.
- It should have following features/specifications:
    - Channels: 4 Flows, 1 Doppler, 2 Pressure and 2 ECG/AUX channels.
    - Calculation: Systolic, Diastolic, mean flow in ml/minute and the maximum derivative.
    - Real time data using transit time flow measurement (TTFM) for verification and determination of patency for intra-operative control.
    - System should provide flexibility in graft flow analysis and data storage for future reference, patient report/database printout, export in PDF format, data storage in USB.
    - It should have a workflow configuration and should be DICOM compatible.

Transit Time Flow Measurement (TTFM):

- Should be easily applicable with wide range of size to treat vessels from 1.5 mm to 16 mm in diameter.
- The probes should be with/without handles to accommodate various surgical applications, consisting of two angle piezoelectric crystals.

- The ultrasound field generated should be uniform and should measure flow at any given angle.
- The probes should be in sizes 1.5mm, 2mm, 3mm, 4mm and 5mm with display resolution of 0.1 ml/minute and ultrasound transducer excitation frequency of 500KHz to 3.5MHz for TTFM suitable for at least 50 times reuse and easy to clean, disinfect and sterilize.
- Display of graphs. Pulsatility Index (PI), Flow, Diastolic Filling (DF) percentage, HR and ACI (Acoustic Coupling Index).
- System should be able to detect intramural arteries and to quantify blood velocity in the vessel being targeted.
- System should quantify the degree of stenosis in the native artery.
- System should be upgradable to Ultrasound Imaging to include Epicardial and Epiaortic Imaging.
- Ultrasound Imaging (Echocardiography) should have following imaging modes:
    - B-Mode (2D): grayscale image to identify plaque and vessel anomalies.
    - Color Flow Mapping (CFM): color image to determine presence, direction and velocity of the flow.
    - Pulsed Wave Doppler (PW): gray scale image with PW gate and velocity spectrum to search, detect and quantify the degree of stenosis.
- Imaging probe should be plasma sterilizable with the ability to come in direct contact with tissue without the need of any barrier in order to provide clear imaging.
- User manuals and intuitive tutorial videos should be available directly on the system
- Single phase, AC, 50 Hz, 220 Volts, fused with proper electrical insulation and RF/EMI emission approval.
- The system should have a battery backup of at least 30 minutes or online UPS with a backup of at least 30 minutes.

Accessories:

- System should be complete with all workable accessories.
- 10 Probes of different sizes and frequencies as per requirement of Procurement Agency.
- An original copy of “Complete Service Manual” from the manufacturer with a soft copy.

Optional: (If any)

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Cardiac Surgery
Generic Name	**Intra-Aortic Balloon Pump (IABP)**
Clinical Purpose	Intra-Aortic Balloon Pump (IABP) is a mechanical device that increases myocardial oxygen perfusion while at the same time increasing cardiac output, increase coronary blood flow and therefore myocardial oxygen delivery.

TECHNICAL SPECIFICATIONS

- Self-contained Fiber Optic based Intra-Aortic Balloon Pump having mobile console with ECG.
- Amplifier with possible selection 5 leads arterial blood pressure amplifier.
- Discriminative Triggering circuit to command balloon actions on patient's ECG arterial blood pressure curve or internal simulator 80 BPM.
- Color graphic displays at least of 10" for display of arterial and pressure heart rate balloon volume used and alarm conditions with trouble shooting procedures.
- Wave form displays for ECG, arterial pressure and balloon pressure on three channel memory type oscilloscope.
- Fall safe system.
- V Pacing switch.
- Progressive viewing sequence.
- Integrated battery power supply to take patient to catheterization labs, operating theatre or other hospital
- 60 minute autonomy. CO2 / helium tank wrench. 5 lead ECG cable, male connector pressure, transducer, adopter, chart recorder.
- AC input 220 V, 50 Hz.
- A battery backup of minimum of 60 minutes.
- System should be complete to display all the parameters.
- The system should have the ability to automatically calibrate in the patient after insertion and automatically recalibrate in every two hours or sooner should patient hemodynamics or environmental condition changes__in vivo calibration (To be decided by the Procuring Agency)
- It should have the facility to control the deflation point in automatic mode. (To be decided by the Procuring Agency)

Accessories:

- Complete with standard and workable accessories
- One spare set of ECG cable.

• Vascular Doppler which should be provided with IABP to monitor Arterial Perfusion for Critical Limb Ischemia • An original copy of “Complete Service Manual” from the manufacturer with a soft copy.
Optional: (Procuring Agency will select according to its need) • Disposable balloon catheters of varying sizes for use with the pump (Qty:25) • Both the simulator and calibrator with IABP for training and calibration purposes respectively. • Back up Helium Cylinder for transportation Purpose and in Hospital setting.

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Cardiac Surgery
Generic Name	**Myocardial Protection Management System (MPMS)**
Clinical Purpose	It is used for automatic cardioplegia delivery to the myocardium during a cardiovascular surgery. It optimizes the aerobic environment for the myocardium through an increase in oxygen supply, buffering and the ability to adjust Potassium, Magnesium and other additives to meet the specific needs of the patient. The detrimental consequences of unnecessary hemodilution, volume overload and potential blood transfusions are avoided.

TECHNICAL SPECIFICATIONS

- It should be a complete System with all workable necessary accessories.
- It should include a gravity filled non-occlusive pump, drug delivery control and monitoring, and air emboli protection.
- It should be able to arrest, protect and optimally maintain the tissue.
- It should have the capability of pressure controlled flow-modulated delivery, the system should automatically adjust for changes in vascular resistance to optimize distribution.
- It should provide an accurate temperature control feature with adjustable range from responsive cold, warm or tepid.
- It should include following features
    - Route (Antegrade and retrograde with tubing clamps)
    - Auto Pressure (Automatically adjust flow to maintain a constant delivery pressure)
    - Blood Crystalloid Ratio
    - Flow (Precise, continuous or cyclic delivery)
    - Ischemic run timer
    - Display actual delivery volume
    - Display Temperature, Pressure and have controls of Additive and Arrest Agent.
    - Built-in Heat Exchanger, Air-in-Line sensor and Automatic air venting.
    - An integrated heater/Cooler System.
    - It should be compatible with Heart-Lung Machine (Plus Accessories & Disposables)
    - Cardioplegia delivery set and Arrest Agents additive cassettes (Qty: 50)

Accessories:

- Complete with all standard accessories

• An original copy of “Complete Service Manual” from the manufacturer with a soft copy.
Optional: (If Any)

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Cardiac Surgery
Generic Name	**Endoscopy for Minimal Invasive Cardiac Surgery (MICS)**
Clinical Purpose	Minimally invasive heart surgery involves making small incisions in the right side of chest to reach the heart between the ribs, rather than cutting through the breastbone, as is done in open-heart surgery. It is performed to treat a variety of heart conditions. Compared with open-heart surgery, this type of surgery might mean less pain and a quicker recovery.

TECHNICAL SPECIFICATIONS

Camera System:

- 5mm forward oblique 30˚.
- Camera full HD CMOS/3CCD compatible
- Camera control unit and video camera head, pal system.
- Resolution 1920 x 1080 pixel progressive scan
- Power supply 100 – 240 VAC, 50Hz
- Automatic white balance
- Powerful video signal processing
- Camera head with CMOS/3CCD sensor, max resolution 1920x1080 pixels
- Camera head can be wipe disinfected

Monitor:

- Medical grade monitor 26” or more with max resolution 1920 x 1080 pixel

Light Source:

- Xenon/LED type working hours 25K or more
- Built-in fiber optic cable tester
- Light guide cable internal bundle diameter 4mm or more
- Length 200 – 300 cm or more

Electronic CO2 Insufflator

- 40-50 liter/min, complete with all standard accessories

Imported Trolley:

- From same manufacturer/principal with all standard accessories.

NOTE: The system must be provided with complete dedicated instruments of Minimal Invasive Cardiac Surgery (MICS).

Accessories:

• System should be complete with all accessories. • An original copy of “Complete Service Manual” from the manufacturer with a soft copy.
Optional: (If any)

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Cardiac Surgery
Generic Name	**Blood Cell Separator**
Clinical Purpose	Blood Cell Separator is an advanced medical device in which the blood of a donor or patient is passed through an apparatus that separates out one particular constituent and returns the remainder to the circulation.

TECHNICAL SPECIFICATIONS

- Programmable microprocessor controlled latest blood component collection technology.
- Apheresis system for cell therapy, therapeutic apheresis and transfusion medicine.
- Should be applicable to both adults and pediatrics.
- Discontinuous flow centrifuge system.
- Single needle for all type of application protocols.
- Aphaeresis options to collect Platelets, Red Blood Cells, Plasma & Stem Cells.
- Leukodepleted platelets in a fully automated procedure
- Ease of use & flexibility
- Data acquisition capability
- Upgradeable Software & compatible with new generation of kits
- Centrifuge Speed: 3000-7000 RPM
- Inlet Flow ml/min: 20-100
- Anticoagulant Ratio: 1:8 – 1:16
- Monitors & Alerts: 4 air detectors, 2 pressure monitors, 2 spill sensors, 2 separation sensors.
- Should be able to work on both closed & open apheresis kits.
- Should have self-regulating flow

Protocols

- Leukodepleted Platelets & Plasma
- Therapeutic Plasma Exchange
- Blood Component Collection
- Platelet Poor Plasma
- Fresh Frozen Plasma
- Leukodepleted Platelets & Red Blood Cells

- Red Blood Cells & Plasma

Accessories:

- Complete system with all accessories.
- 100 complete disposable kits to be used with the system.
- Imported compatible Sine Wave UPS for back up of at least 30 minutes (Emerson, Liebert, Chloride, MGE, APC or equivalent)
- An original copy of “Complete Service Manual” from the manufacturer with a soft copy.

Optional (If any):

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Cardiac Surgery
Generic Name	**RF Ablation System**
Clinical Purpose	Also known as a cardiac ablation or radiofrequency ablation, this procedure guides a tube into the heart to destroy small areas of tissue that may be causing abnormal heartbeat.

TECHNICAL SPECIFICATIONS

- It should be compatible with all advanced Cardiac Mapping Systems and ablation catheters of all leading companies
- RF Ablation Generator should operate in power or temperature control mode with irrigated or standard tip ablation catheters.
- Device should have both the output frequencies- Monopolar and Bipolar.
- Device should have output frequency: 4 MHz or more for Monopolar and 1.7 MHz or more for Bipolar.
- It should carry automatic irrigation flow adjustment feature.
- The generator should control Irrigation Pump to adjust flow settings.
- It should carry footswitch device that allows the RF generator to be operated wherever it is best and most convenient for the lab and procedure
- Device should have a minimum output power of 90 W.
- Device should have Cut (90W or above), blend (65 W or above), Coag(45 W or above), fulgurate(35 W or above) and bipolar (90 W or above) output waveforms.
- Device should come with a dual frequency footswitch and cable.
- Device should have an option of both reusable and disposables consumables.
- Device should have Digital Control Panel for easy operation and clear view of settings.
- Device should have Solid State Circuitry for dependable and consistent energy emission.
- Device should have auto-cut facility.
- Device should have safety indicators to provide visual and auditory alerts.
- Device should have parameter recall for rapid set-up.
- Device should have an audible alarm for neutral plate dislodgement.
- Device should be able to produce very sharp and precise cutting, negligible lateral heat production, and adequate hemostasis.
- Device should come with a foot-controlled hand piece.
- Device should be a quieter system, small, lightweight generator for easy portability.

- Device should come with a reusable medical electrode kit.
- Device should come with an instantly ready to use hand piece.
- Device should have platform to use multiple electrodes, for various surgical procedures.

Irrigation Pump:

- The irrigation pump is a peristaltic pump designed for the delivery of irrigation solution through the tubing set. The pump is part of an integrated system that features two-way communication with the cardiac ablation generator for automated fluid rate control during irrigated ablations.
- Fully programmable rates—up to 40 ml/min. Tracks and displays total irrigated volume.
- Exclusive In-line occlusion detection
- Dual bubble detectors
- 2 µL air bubble detection
- Bubble detection diagnostic self-check
- Flow rate displayed on highly Visible LED mounted on IV pole
- Safety features should automatically be enabled
- Fully integrated with the Irrigated ablation systems
- It should have following minimum specifications
    - Mechanism: Peristaltic
    - Flow Rate
        - Low Flow: 1-5 ml/min (1ml/min increments)
        - High Flow: 6-40 ml/min (1ml/min increments)
    - Priming flow rate: 60 ml/min
    - Air Bubble detection 2 µL
    - Alarms: Bubble detection, communication lost, door open; pressure sensor not connected and occlusion.

It should be possible to switch between both low and high flow rates automatically or manually.

Accessories:

- Complete system with all accessories.
- An original copy of “Complete Service Manual” from the manufacturer with a soft copy.

Optional (If any):

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Cardiac Surgery
Generic Name	**Ventricular Assist Device (VAD) (for Permanent Destination Therapy (PDT))**
Clinical Purpose	An implanted heart pump called a ventricular assist device (VAD) can help the heart pump oxygen-rich blood throughout the body and improve the symptoms of advanced heart failure. It is designed to restore blood flow and improve survival, functional status and quality of life for Long-term support.

TECHNICAL SPECIFICATIONS

- It should be a complete System with all workable accessories.

The Pump:

- The Pump should have a full magnetic levitation technology.
- Pump should be approved by US FDA for intention to provide long term hemodynamic support in patient with advanced, refractory ventricular heart failure for permanent destination Therapy (DT).
- The pump should be capable of supporting patients with BSA of 1.6 m2 or more
- It should be able to generate artificial pulsatility
- Pump should be light weight not more than 200 grams
- External diameter should be less than 70 mm
- Pump should be able to display flow between 2.5-10 L/min
- Pump rotor should be completely suspended by magnetic forces, preventing surface to surface contact.
- Pump should be able to run between 3000 to 9000 RPM & should be able to change speed with 100 RPM

Monitor:

- Monitor should be able to show pump parameters like RPM Flow, Power, PI, history & ability to save the data from controller & pump.
- Monitor should be able to provide information of Back up batteries for controller & alarms.

Controller:

- Controller should be microprocessor based, & have LCD display to show pump parameters, alarms, and recommended trouble shooting.
- Controller of the pump should be able to display last 6 alarms.
- System controller monitors performance of system, communicates to implanted VAD pump. It

should continuously be able to check driveline, performs data processing & storage, fault detection & alarms.

- 2 Batteries together should be able to support for more than 16 hours

Driveline:

- The Driveline should consist of two cables: The Pump Cable and a replaceable Modular Cable.
- The drive line should be thin & covered with Woven polyester which encourages tissue ingrowth, reducing the possibilities of infection.
- The pump should be able to be used in any of two configurations via line power or portable Battery power.

Accessories:

- Complete system with all accessories.
- 10 complete disposable kits to be used with the system.
- The pump should be provided with 8 Li Ion batteries, Battery charger, line power source (mobile power unit), 2 battery clips, shower bag & consolidated bag.
- An original copy of “Complete Service Manual” from the manufacturer with a soft copy.

Optional (If any):

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Cardiac Surgery
Generic Name	**Ventricular Assist Device (VAD) (for Bridge to Myocardial Recovery (BTR))**
Clinical Purpose	It is used as temporary circulatory support for up to 30 days for one or both sides of the heart to treat post-cardiotomy patients who fail to wean from cardiopulmonary bypass, providing a bridge to decision when it is unclear whether the patient's heart will recover or whether the patient will need alternative, Longer-term therapy.

TECHNICAL SPECIFICATIONS

- It should be a complete system with all workable accessories.
- The system should be approved by US FDA for intention to provide temporary circulatory support for up to 30 days for one or both sides of the heart to treat post-cardiotomy patients who fail to wean from cardiopulmonary bypass (bridge to myocardial Recovery (BTR))

Pump

- The Blood Pump should be centrifugal in nature and be designed to allow improved blood handling to decrease trauma by magnetically levitating and rotating the impeller.
- It should have following properties:
    - Blood contact materials: Polycarbonate
    - Pump priming volume: ≤ 35 ml
    - Pump rotational range: 0-5,500 RPM
    - Outflow capacity: 0-10.0 LPM
    - Outflow pressure: 0-600 mmHg
    - Connects to 3/8 inch (9. 5 mm) I.D. tubing
- The system should be complete with Pump, Motor, Console, Monitor, Flow Probes, Cannulas and all necessary workable accessories.

Monitor:

- Should display data from the Console and to provide an alternative means of controlling the Console via the soft touch keys on the Monitor.
- The LCD screen on the Monitor should display operational data, system options, and menus, operator settable alarms and parameters accessible via system menus.
- Data from up to two Consoles can be displayed simultaneously on one Monitor.

Console

- The Console should be a microprocessor-based device.
- Should be with one primary and one secondary Consoles
- Console should have a rechargeable internal battery that is capable of maintaining console functionality in the event of a loss of AC power.

Flow Probes

- Flow Probes should be in two sizes for use with the Console. Each Flow Probe should be a reusable, non-patient contacting ultrasonic Flow Probe which is optimized to detect flows from 0-10.0 LPM or 0 – 3.0 LPM depending on probe size.

System Cart

- It should have a dedicated system cart along with mounting accessories from the same manufacturer.
- Power: 220V AC, 50 Hz

Accessories:

- Complete system with all workable accessories.
- 10 complete disposable kits to be used with the system.
- Imported compatible Sine Wave UPS for back up of at least 90 minutes (Emerson, Liebert, Chloride, MGE, APC or equivalent)
- An original copy of “Complete Service Manual” from the manufacturer with a soft copy.

Optional (If any):

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Cardiac Surgery
Generic Name	**Cerebral Oximeter**
Clinical Purpose	Cerebral oximeters are non-invasive, continuous monitoring devices, used to monitor adequate cerebral oxygenation.

TECHNICAL SPECIFICATIONS

- Oxygen saturation (rSO_2) of blood in the brain for adult, children, infant and neonates.
- Should have two to four data channels
- Monitor multiple brain areas
- Sensor cables
- Complete system with all accessories.
- An original copy of “Complete Service Manual” from the manufacturer with a soft copy.

Accessories:

- adult, children, infant and neonatal sensors
- Sensor cables
- Complete system with all accessories.
- An original copy of “Complete Service Manual” from the manufacturer with a soft copy.

Optional (If any):

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Cardiac Surgery
Generic Name	**Online Monitor for Perfusion Diagnostics**
Clinical Purpose	Non-invasive monitor used for perfusion circuit diagnostics.

TECHNICAL SPECIFICATIONS

Should measure following parameters

- Oxygen delivered to the perfusion circuit
- Systemic Oxygen uptake
- Oxygen expiration ratio
- Following ventilation parameters
    - FiO_2
    - $FiCO_2$
    - Sweep
    - FeO_2 %
    - $FeCO_2$ %
- Measurement of emboli and gross emboli on arterial line.

Accessories:

- All measuring probes
- Complete system with all accessories.
- An original copy of “Complete Service Manual” from the manufacturer with a soft copy.

Optional (If any):

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PRODUCTVOCABULARY MEDICAL STORE(PVMS) OF OPHTHALMOLOGY

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PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**OPERATING MICROSCOPE (BASIC OPERATING MICROSCOPE WITH STEPPED MAGNIFICATION)**
Clinical Purpose	Surgery

TECHNICAL SPECIFICATIONS

1. Floor mounted stand
2. Microscope body with 5 step magnification changer (manual or motorized)
3. Built in coaxial illumination, motorized fine focusing and manual/motorized coarse focusing
4. Objective: f=175 or f=200.
5. Binocular tube inclined at fixed angle.
6. Eyepiece 10x or 12.5x with diopteric adjustment.
7. Sterilization protective caps for all drive knobs.
8. Illumination with controllable intensity with halogen or LED.
9. With or without fiber optics.
10. Water proof foot control pannel
11. Upgradable with accessories.

Accessories :

1. Six spare halogen bulbs (in case of halogen illumination).
2. Dust cover

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**OPERATING MICROSCOPE (BASIC OPERATING MICROSCOPE WITH ZOOM)**
Clinical Purpose	Surgery

TECHNICAL SPECIFICATIONS

1. Floor stand mount microscope body with zoom (ratio 1:5 or better).
2. Linear/Continuous zooming
3. XY coupling
4. Built-in coaxial illumination with red reflex.
5. Motorized fine focusing and manual or motorized coarse focusing
6. Objective f=175mm/ f=200 mm
7. Binocular tube: inclined at a fixed / variable angle (end user to specify)
8. Eyepiece: 10 X or 12.5X with dioptric adjustment
9. Halogen/LED illumination with controllable intensity with/without fiber optic cable
10. Water proof foot control panel.
11. Sterilizeable protective caps for all drive knobs

Accessories:

1. 06 spare halogen lamps (in case of halogen illumination).
2. Dust cover.

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**OPERATING MICROSCOPE (TEACHING OPERATING MICROSCOPE)**
Clinical Purpose	Surgery

TECHNICAL SPECIFICATIONS

1. Floor mounted stand
2. Microscopic body with linear motorized zoom (1:5 or better)
3. Built in coaxial illumination, motorized fine focusing, coarse focusing (Manual or Motorized).
4. Objective: f=200.
5. Motorized XY coupling.
6. Binocular tube inclinable at various angles
7. Eyepiece: 10x or 12.5x with dioptric adjustment.
8. Fully apochromatically corrected optics with high light transmission.
9. Sterilization protective caps for all drive knob 03 sets.
10. Halogen illumination with controllable intensity / Light Emitting Diode, with or without fiber optic cable. Water proof foot control panel.
11. Upgradable with accessories.
12. Adjustable speed for focus, zoom and XY.
13. Binocular stereoscopic assistant's attachment with inclination
14. CCTV attachment including adapter, 3 CCD /HD Camera (excluding SD camera)with or without beam splitter.
15. Digital recording system/USB recording with hard drive.
16. 20" or better LCD or LED monitor (In case of Medical grade) / 30" or better LCD or LED monitor (In case of non medical grade)
17. Retinal vision system with attachment. Including (120 Degree , 90 Degree , and Macular lens)

Accessories:

1. Dust cover.
2. 06 spare bulbs (in case of halogen illumination).

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**OPERATING MICROSCOPE (TEACHING OPERATING MICROSCOPE WITH ELECTORMAGNETIC BRAKES)**
Clinical Purpose	Surgery

TECHNICAL SPECIFICATIONS

1. Floor Stand /Ceiling Mounted(end user to specify)
2. Microscopic body with linear motorized zoom (1:5 or better),
3. Built in coaxial illumination, motorized fine focusing, coarse focusing (Manual or Motorized).
4. Electromagnetic brakes
5. Objective: f=200.
6. Motorized XY coupling.
7. Binocular tube inclinable at various angles
8. Eyepiece: 10x or 12.5x with dioptric adjustment.
9. Fully apochromatically corrected optics with high light transmission.
10. Sterilization protective caps for all drive knob 03 sets.
11. Halogen illumination with controllable intensity / Light Emitting Diode, with or without fiber optic cable.
12. Water proof foot control panel.
13. Up gradable with accessories.
14. Adjustable speed for focus, zoom and XY.
15. Binocular stereoscopic assistant's attachment with inclination
16. CCTV attachment including adapter, 3 CCD HD Camera with or without beam splitter.
17. Digital recording system/USB recording with hard drive.
18. 20" or better LCD or LED monitor (In case of Medical grade) / 30" or better LCD or LED monitor (In case of non medical grade)
19. **Retinal vision system with attachment. Including (120 degree , 90 degree , and Macular lens)**

Accessories :

1. Dust cover.
2. 06 spare bulbs (in case of halogen illumination).

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**OPERATING MICROSCOPE (TEACHING OPERATING MICROSCOPE WITH ELECTORMAGNETIC BRAKES) WITH INTRA OPERATIVE OCT**
Clinical Purpose	Surgery

TECHNICAL SPECIFICATIONS

1. Floor Stand/ Ceiling Mounted, microscopic body with linear motorized zoom (1:5 or better),
2. Built in coaxial illumination, motorized fine focusing, coarse focusing (Manual or Motorized).
3. Electromagnetic brakes
4. Objective: f=200.
5. Motorized XY coupling.
6. Binocular tube inclinable at various angles
7. Eyepiece: 10x or 12.5x with dioptric adjustment.
8. Fully apochromatically corrected optics with high light transmission.
9. Sterilization protective caps for all drive knob 03 sets.
10. Halogen illumination with controllable intensity / Light Emitting Diode, with or without fiber optic cable.
11. Water proof foot control panel.
12. Up gradable with accessories.
13. Adjustable speed for focus, zoom and XY.
14. Binocular stereoscopic assistant's attachment with inclination
15. CCTV attachment including adapter, 3 CCD HD Camera with or without beam splitter.
16. Digital recording system for both OCT and Microscope
17. 20" or better LCD or LED monitor (In case of Medical grade) / 30" or better LCD or LED monitor (In case of non medical grade)
18. Retinal vision system with attachment. Including (120 degree , 90 degree , and Macular lens)
19. **With intra operative OCT:**
20. Spectral domain intra-operative OCT
21. Scan Rate 10,000 A- Scan / Second or better
22. Microscope Mount
23. Display TFT / LED / LCD

Accessories :

1. Dust cover.
2. 06 spare bulbs (in case of halogen illumination).

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**CORNEAL ANTERIOR AND POSTERIOR TOPOGRAPHY SYSTEM**
Clinical Purpose	Diagnostic for corneal diseases

TECHNICAL SPECIFICATIONS

1. Topographical keratoconus detection
2. Topography and elevation maps of the anterior and posterior corneal surface
3. Pachymetry maps.
4. Refractive maps
5. Iris image and horizontal white to white measurement
6. Comparison and differential analysis.
7. Scheimpflug/Slit scan/placido/OCT based
8. Computer system originally supplied by manufacturer

Accessories :

1. Color Laser/High photo quality inkjet printer with one extra toner set
2. With original motorized table/Imported from Europe/Japan/USA.

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**OPTICAL COHERENCE TOMOGRAPHY (OCT)**
Clinical Purpose	Diagnostic for Retina glaucoma and corneal diseases.

TECHNICAL SPECIFICATIONS

1. Scan modes : Confocal/LSO/SLO/lLive OCT Fundus/Fundus Image
2. Scan speed : Min 50,000 A-Scan/sec or more
3. Including Optic Nerve Head Analysis, Macula
4. Anterior Segment : With Anterior Segment Module
5. Computer: Originally Supplied by the manufacturer.

Accessories :

1. Color laser printer with one extra toner set
2. With original motorized table/ Imported from USA/ Europe/ Japan

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**A&B SCAN WITH BIOMETRY**
Clinical Purpose	Diagnostic. Retinal diseases and intraocular lens power calculation.

TECHNICAL SPECIFICATIONS

1. A&B modes with control vector and biometric ruler with computer to calculate IOL power.
2. Digital Memory and image freezing.
3. Ultrasonic bio-meter for manual or automatic freezing system via foot pedal when valid measurement is detected.
4. Measurement of axial length, ACD and lens thickness, features measurement of 5 or more reading with adjustable gates/gain.
5. Standard deviation of multiple scans, fully digitized display of real time echograms.
6. Solid probe with fixation light.
7. Audio feedback for probe alignment.
8. With standard formulae.
9. LCD /LED/TFTmonitor alphanumeric or analog display of overall gain.
10. Near field and dynamic setting.
11. Depth of examination 35mm or better.
12. In B mode scanning angle 40 degree or more.
13. 10 MHz or better B Probe.
14. 10 MHz or better biometry probe.

Accessories:

1. With compatible laser printer and one extra toner.

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**ULTRSONIC BIOMICROSCOPE (UBM)**
Clinical Purpose	Diagnostic. Anterior Segment diseases

TECHNICAL SPECIFICATIONS

1. Digital Memory and image freezing
2. LED/LCD /TFT monitor alphanumeric or analog display of overall gain
3. Linear transducer movement: 16 mm or better
4. Focus: 9mm or better
5. Axial Resolution: 35 µm
6. Lateral Resolution: 60 µm
7. 50 MHz or better UBM Probe

Accessories:

1. With compatible laser printer and one extra toner.

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**B SCAN**
Clinical Purpose	Diagnostic. Retinal diseases
TECHNICAL SPECIFICATIONS	
1. Digital Memory and image freezing. 2. LED/LCD /TFT monitor alphanumeric or analog display of overall gain. 3. Near field and dynamic setting 4. Depth of examination range min:35mm or better and max:50mm or better. 5. In B mode scanning angle 40 degree or more. 6. 10 MHz or better B Probe. 7. Gray scale 256 or better.	
Accessories : 1. With compatible laser printer.	

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**BIOMETER (A-SCAN)**
Clinical Purpose	Diagnostic for IOL power calculation

TECHNICAL SPECIFICATIONS

1. Ultrasonic bio-meter for manual or automatic freezing system via foot pedal when valid measurement is detected.
2. Measurement of axial length, ACD and lens thickness, features measurement of 5 or more reading with adjustable gates/Gain.
3. Standard deviation of multiple scans, fully digitized display of real time echograms.
4. Solid probe with fixation light.
5. Audio feedback for probe alignment.
6. With standard formulae

Accessories :

1. Compatible laser printer for all data.

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**OPHTHALMIC DIODE PUMPED SOLID STATE WITH ENDO LASER TECHNOLOGY**
Clinical Purpose	Therapeutic. Retinal treatment

TECHNICAL SPECIFICATIONS

1. Ophthalmic Diode Pumped Solid State Frequency Doubled LASER Photocoagulation with 532nm output.
2. Wave length: 532nm Diode Pumped Frequency Doubled Solid State.
3. Power at tissue up to: 1W or better.
4. Pulse Duration: min:0.05sec or higher to 1sec or higher.
5. Repeat interval: 3 interval selection or better.
6. Cooling: Thermoelectric / Air cooled.
7. With foot switch.
8. Slit lamp adaptation with spot size 50 to 500 µm (par focal range) or better.
9. Standard halogen/LED slit lamp.
10. Standard filter and Micromanipulator.
11. LASER application lenses (One for Macular grid, one Standard PRP and one wide field PRP)

Accessories :

1. Standard Accessories
2. Imported motorized table for slit lamp and laser.

Optional:

1. Indirect ophthalmoscope laser delivery system
2. Endolaser probes gauge and quantity to be decided by end user

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**DIODE LASER**
Clinical Purpose	Therapeutic

TECHNICAL SPECIFICATIONS

1. Consisting of main console with power supply.
2. Treatment wavelength : 805 / 810nm
3. Power : 1W or better
4. Aiming beam: adjustable
5. Spot size : Variable
6. Pulse duration: 0.01 sec. to 0.5 sec.
7. Subliminal / Subthreshhold / Micropulse mode
8. Cooling : Air/thermoelectric
9. Foot switch.
10. With standard accessories including Cyclophotocoagulation probe/ (G probe)/micro pulsed probe.

Accessories :

1. With original motorized table/Imported from Europe/Japan/USA.

Optional (If any)

1. Endolaser probes gauge and quantity to be specified by end user.

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**OPHTHALMIC YAG LASER**
Clinical Purpose	Therapeutic

TECHNICAL SPECIFICATIONS

1. Q-Switch Nd- YAG Laser.
2. Solid state
3. Laser Wave length: 1064nm.
4. Laser power: upto10mJ
5. Pulsed Length: 2 to 4 ns.
6. Aiming Beam: He Ne / Diode.
7. Cooling : Air
8. Spot size: Less than 20 microns
9. Power: 220V, 50 Hz.
10. Contact Lenses for Yag, Capsulotomy and Iridotomyrequired

Accessories :

1. With original motorized table/Imported from Europe/Japan/USA.

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**OPHTHALMIC MULTI-SPOT SOLID STATE PHOTOCOAGULATOR (PATTERN LASER)**
Clinical Purpose	Therapeutic, Retinal treatment

TECHNICAL SPECIFICATIONS

1. Wave length: 532nm/577nm
2. Power at tissue up to: 1 W or better.
3. Pulse Duration: 0.1 sec to 1sec or better
4. Cooling: Thermoelectric / Air cooled
5. With foot switch
6. Spot size: 100 to 400 µm or better
7. Single spot mode: single, repeat
8. Patterns: Square, circle, arc, line, single spot
9. Standard slit lamp.
10. Standard filter
11. Laser application lenses – One macular grid, One standard PRP and one wide field lens

Accessories :

1. With original motorized table for slit lamp and laser (Imported from Europe/Japan/USA).

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**DIGITAL FUNDUS CAMERA (VARIABLE ANGLE) (DIGITAL RETINAL IMAGING SYSTEM)**
Clinical Purpose	Diagnostic. Retina

TECHNICAL SPECIFICATIONS

2. Digital Fundus Camera (variable Angle)
3. Variable Angle: Max 50 degree or better.
4. Focusing System: Fine focusing and Coarse focusing.
5. Tilting Facility provided both horizontal and vertical.
6. Optimum working distance: 35 mm onward.
7. Provided with range of examiner's dioptric compensation.
8. Facility provided for fundus fluorescein angiography along with set of two standard filters.
9. Light source for observation: Halogen Lamp and for flash Xenon bulb.
10. Flash intensity: 300W or better.
11. Fixation light and internal fixation target Power: 220V, 50Hz AC.
12. Compatiblecomputersystem with standard software (min: Core i5 latest generation)

Accessories :

1. Compatible Printer.
2. With original motorized table/Imported from Europe/Japan/USA.

Optional:

1. Dicom Compatible

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**AUTOMATED PERIMETER / VISUAL FIELD ANALYZER**
Clinical Purpose	Diagnostic. Optic nerve diseases/Neurological diseases

TECHNICAL SPECIFICATIONS

1. Perimeter able to perform detailed examination of visual field from screening to threshold testing.
2. Multi stage software program.
3. Accurate examination with central 80 degree or better.
4. Program: Screening test, threshold and macula.
5. Constant patient monitoring through CCD / CMOS camera.
6. Defect level indicator informs the examiner the status of the field of vision with every stimulus.
7. Direct projection optics technology with variable stimulus intensity and size as per Goldman standard. Comprehensive printout facility through conventional compatible printer.
8. Descriptive report provided with clear statistical assessment of the field data
9. Compatible builtin or separate computer system with standard software

Accessories :

1. With original motorized table/Imported from Europe/Japan/USA.

Optional:

1. Blue on Yellow Testing Facility
2. Dicom Compatible

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**OPHTHALMIC PHACOEMULSIFICATION UNIT**
Clinical Purpose	Therapeutic. Cataract surgery

TECHNICAL SPECIFICATIONS

1. Main console with surgeon setting programming.
2. Phaco modulation choice of pulse and burst mode.
3. Vacumm 0-500 mmHg or better
4. Provision for 2.2 & 2.8 mm tips.
5. Programmable foot pedal.
6. Pump: Peristaltic /Venturi / Peristaltic &Venturi (combined).
7. Irrigation/ Aspiration hand pieces
8. I/A tubing set with collection bottle / container/ bag / cassette(Quantity 3)
9. I/A test chamber (Quantity 10)
10. Irrigation sleeves (Quantity 10)
11. Phaco needle 30 deg bevel round (Quantity 6), metal Wrench for tightening needle (Quantity 3).
12. Disposable anterior vitrectomy cutter (Quantity3)
13. Phaco hand piece (Quantity 2) with sterilization box

Accessories :

1. With original trolley
2. Dust cover

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**POSTERIOR VITRECTOMY UNIT**
Clinical Purpose	Surgery. Retina.

TECHNICAL SPECIFICATIONS

1. Vitrectomy cutter type: Pneumatically Driven 23G, 25G / 27GCompatibility disposable or auto clavable Cutting Rate: Range Min 4000 cuts per minute or better.
2. Actuating Medium: Pressurized Air from external source.
3. Control: Linear / Dual linear system foot switch & screen.
4. Diathermy: Bipolar 23G, 25G / 27G compatibility. (Auto clavable or Disposable).
5. Fluidics: Vacuum up to 500mmhg or better.
6. Cassette: Disposable. Tubing set: Auto-clavable /Disposable
7. Pump Type: Venturi /Peristaltic
8. Scissors & Forceps: Compatible.
9. Start up Accessories Kit.
10. Illumination type: Min two independent light sources or converter compatible.
11. Illumination bulb type: Xenon or LED.
12. Tamponande: Oil injection module, extraction module, air tamponade
13. Phaco Emulsification Hand piece 4 crystal or better. (Quantity 2)
14. Fragmatome: Intravitreal fragmentation compatible.
15. With original trolley and motorized bottle height control.
16. Electric power: 200 – 240V, 50Hz AC,

Accessories :

1. Pneumatic or motor driven guillotine cutter reusable / disposable.
2. Bipolar cable, Bipolar forceps, Bipolar eraser, Endo diathermy probe.
3. Infusion cannula 2.5mm, 4.0mm, 6.0mm
4. Extrusion hand piece reusable 23,25G
5. Posterior vitrectomy cutters/ packs23, 25G (Quantity 05)
6. Tubing set for fluid-gas exchange (Quantity 05)
7. Imported sine wave UPS backup internal / external 15 minutes or better

Optional:

1. Integrated / standalone Green Laser 532 nm
2. Imported Micro vitrectomy scissors Horizontal, Vertical reusable 23,25G.
3. Imported Micro vitrectomy end gripping forceps reusable 23,25G.
4. Imported Micro vitrectomy ILM Forceps reusable 23,25G
5. Imported Micro vitrectomy ERM Forceps reusable 23,25G
6. Imported Micro vitrectomy Foreign Body Forceps reusable 23,25G

Note: Scissors & forceps can be supplied by third party manufacturer

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**SLIT LAMP BIOMICROSCOPE WITH DIGITAL IMAGING SYSTEM**
Clinical Purpose	Diagnostic for examination of the eye and teaching of students simultaneously.

TECHNICAL SPECIFICATIONS

1. Binocular tube with vertical type eye width adjustment.
2. Illumination LED or Halogen.
3. Eyepieces with dioptric adjustment 10X to 16X any one pair.
4. Magnification range variable from 10x to 35x (5 steps or zoom).
5. Slit length: variable.
6. Tilt mechanism: 20 degree or better.
7. Slit image rotation: 0 to 180 degree .
8. Filters: Standard filters With hanging type applanation tonometer. with extra prism and calibration kit
9. Including original digital camera with adapter.
10. PC for reporting: Core i5, 4GB RAM, 1TB hard disk or better, USB port. 19’ LCD/LED

Accessories:

1. With original motorized table/Imported from Europe/Japan/USA.
2. Dust cover
3. Chin rest papers
4. Breath shield
5. With extra 12 lamp only for Halogen illumination Slit lamp

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**SLIT LAMP BIOMICROSCOPE**
Clinical Purpose	Diagnostic/Examination of Eye

TECHNICAL SPECIFICATIONS

1. Binocular tube with vertical type and eye width adjustment.
2. Illumination LED or Halogen.
3. Eyepieces with dioptric adjustment 10x.
4. Slit length: variable.
5. Tilt mechanism.
6. Slit image rotation: 0 to 180 degree.
7. Filters: Standard.
8. With hanging type applanation tonometer with one extra prism and calibration kit.

Accessories :

1. With original motorized table/Imported from Europe/Japan/USA.
2. Dust cover.
3. Plastic breath-shield.
4. Chin-rest papers.
5. With extra 12 lamps only for halogen illumination Slit Lamp.

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**SLIT LAMP BIOMICROSCOPE WITH TEACHING AID**
Clinical Purpose	Diagnostic for examination of the eye and teaching of students simultaneously.

TECHNICAL SPECIFICATIONS

1. Binocular tube with vertical type eye width adjustment.
2. Illumination LED or Halogen.
3. Eyepieces with dioptric adjustment 10X to 16X any one pair.
4. Magnification range variable from 10x to 35x (5 steps or zoom).
5. Slit length: variable.
6. Tilt mechanism: 20 degree or better.
7. Slit image rotation: 0 to 180 degree .
8. Filters: Standard filters With hanging type applanation tonometer. with extra prism and calibration kit
9. Beam Splitter with teaching aid

Accessories:

1. With original motorized table/Imported from Europe/Japan/USA.
2. Dust cover
3. Chin rest papers
4. Breath shield
5. With extra 12 lamp only for Halogen illumination Slit lamp

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**APPLANATION TONOMETER**
Clinical Purpose	Diagnostic/Examination of Eye
TECHNICAL SPECIFICATIONS	
1. Hanging type / Goldman type. 2. With one extra prism, with calibration kit.	

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**DIRECT OPHTHALMOSCOPE & RETINOSCOPE SET**
Clinical Purpose	Diagnostic/Examination of Eye

TECHNICAL SPECIFICATIONS

1. Standard illumination, aperture dial contains small aperture, standard aperture, concentric scale and slit aperture.
2. Corrective power range: +20 to -30D or better.
3. Control for streak width and streak rotation, streak revolves 360 degree .
4. Head rest to prevent operator's spectacles from getting scratched.
5. Separate handles with rechargeable batteries for Retinoscope& ophthalmoscope.
6. Rechargeable handles with dual desk charger/wall mounted.

Accessories :

1. 3 spare bulbs (in case of Halogen)for Ophthalmoscope.
2. 3 spare bulbs(in case of Halogen) for Retinoscope.
3. Carrying case

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**DIRECT OPHTHALMOSCOPE**
Clinical Purpose	Diagnostic/Examination of Eye

TECHNICAL SPECIFICATIONS
1. Standard illumination, aperture dial contains small aperture, standard aperture, concentric scale and slit aperture. **2.** Corrective power range: +20 to -30D or better
Accessories : 1. Rechargeable handle with charger & batteries. 2. 3 spare bulbs(in case of Halogen). 3. Carrying case

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**RETINOSCOPE**
Clinical Purpose	Diagnostic. To determine the refractive status of the eye.
TECHNICAL SPECIFICATIONS	
1. Standard illumination, 2. Control for streak width and streak rotation, streak revolves 360 degree . **3.** Head rest to prevent operator's spectacles from getting scratched.	
Accessories : 1. 3 spare bulbs(in case of Halogen). 2. Carrying case 3. Rechargeable handle with charger & batteries.	

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**REFRACTION BOX / TRIAL LENS SET**
Clinical Purpose	Diagnostic. To determine the refractive status of the eye.

TECHNICAL SPECIFICATIONS

1. Sphere: ±0.12D to ±20.00D.
2. Cylinder : ±0.12D to ±6.00D.
3. Prisms: 1 to 10D
4. With Standard filters, Maddox rod, occlude, pin hole.
5. With unbreakable light weight anodized aluminum / Plastic mounts and standard accessories in carrying case

Accessories:

1. Universal Trial Frame (Quantity 02)

Optional

1. Jackson Cross Cylinder (End User to Specify)

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**FOCIMETER / LENSOMETER (MANUAL)**
Clinical Purpose	Diagnostic. To determine the power of lenses.

TECHNICAL SPECIFICATIONS

1. Type: ocular internal reading with eye piece.
2. Target : Pinhole corona.
3. Vertex power range: 0 to ±25D.
4. Steps : 0.25D or better.
5. Cylinder axis : 0 to 180 degree .
6. Prismatic power range : 5 prism D.
7. Electricity: 220V, 50Hz AC, or battery operated.
8. Illumination LED / Halogen

Accessories :

1. With one spare bulb (only for halogen illumination).

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**JACKSON CROSS CYLINDER**
Clinical Purpose	Diagnostic/Examination of Eye
TECHNICAL SPECIFICATIONS	
±0.5 & ± 0.25D (pair)	

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**INDIRECT OPHTHALMOSCOPE**
Clinical Purpose	Diagnostic/Examination of retina.

TECHNICAL SPECIFICATIONS
1. Head mounted (adjustable). 2. Illumination LED or Halogen. 3. Pupillary distance & size adjustable. 4. Output voltage: variable voltage power supply. **5.** Filters: Red free, Cobalt blue, Teaching mirror. Scleral depressor, detachment chart and carrying case.
Accessories : 1. With 06 spare bulbs only for halogen illumination ophthalmoscope. 2. 20 D lens and 28 D lens
Optional: Cordless

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**INDIRECT OPHTHALMOSCOPE (TEACHING)**
Clinical Purpose	Diagnostic/Examination of retina.

TECHNICAL SPECIFICATIONS

1. Head mounted (adjustable).
2. Illumination LED or Halogen.
3. Pupillary distance & size adjustable.
4. Output voltage: variable voltage power supply.
5. Filters: Red free, Cobalt blue, Teaching mirror, Scleral depressor, Detachment chart and Carrying case.
6. Including video digital camera with recoding.
7. PC (Core i5, 4GB RAM, 1TB hard disk or better)/ HD recorder (1TB hard disk or better)for recording: USB port 20''LCD /LED or better

Accessories :

1. With 06 spare bulbs (only for halogen) illumination ophthalmoscope.
2. 20 D lens and 28 D lens

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**AUTO REFRACTOMETER WITH KERATOMETER**
Clinical Purpose	Diagnostic; To determine the refractive status of the eye and power of cornea.

TECHNICAL SPECIFICATIONS

1. With auto measurement & printout with standard accessories.
2. Manual or motorized chin rest movement.
3. Measuring range:
4. Spherical: ±17D or better.
5. Cylinder: ±6 D or better.
6. Axis: 1 to 180 Degree.
7. Pupil distance: Max 85mm (increment 1mm).
8. Display: digital on TV or LCD monitor.
9. Built-in printer
10. Electric power: 220-240V AC, 50Hz.

Accessories :

1. With 6 paper roll, dust cover and cleaning kit.
2. On locally made motorized table.

Clinical Specialty	Ophthalmology
Generic Name	**AUTO REFRACTOMETERWITH KERATOMETER, TONOMETER & PACHYMETER**
Clinical Purpose	Diagnostic. To determine the refractive status of the eye, power of cornea, intraocular pressure and thickness of cornea.

TECHNICAL SPECIFICATIONS

1. With auto measurement & printout with standard accessories.
2. Manual or motorized chin rest movement.
3. Measuring range:
4. Spherical: ±17D or better.
5. Cylinder: ±6 D or better.
6. Axis: 1 to 180 Degree.
7. Pupil distance: Max 85mm (increment 1mm).
8. Cornea curvature radius: 5.00mm to 13.00mm or better
9. Ocular pressure measurement:Measuring range 1mmHg to 60mmHg or better
10. Cornea thickness measurement:Measuring range 0.400mm to 0.750mm
11. Display: digital on TV or LCD monitor with printer.
12. Electric power: 220-240V AC, 50Hz.

Accessories :

1. With 6 paper roll, dust cover and cleaning kit.
2. On locally made motorized table

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**KERATOMETER (MANUAL)**
Clinical Purpose	Diagnostic. To determine the power of cornea.

TECHNICAL SPECIFICATIONS

1. Corneal radius of curvature 6.6mm to 9.2mm or better.
2. Corneal refractive power ranging from 36.5D to 51D or better.
3. Axis of corneal astigmatism 0 to 180 degree.
4. JavalShiotz/Sutcliffe/Internal reading

Accessories :

1. Dust cover
2. Local made motorized table.

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**PNEUMATIC TONOMETER**
Clinical Purpose	Diagnostic. To determine intraocular pressure.
TECHNICAL SPECIFICATIONS	
Noncontact with measurable range 5 to 50 mmHg or better in 1mmHg step.	
Accessories : With standard accessories, safety locks and built in printer. With locally made motorized table	

Clinical Specialty	Ophthalmology
Generic Name	**PNEUMATIC TONOMETER WITH PACHYMETRY**
Clinical Purpose	Diagnostic. To determine intraocular pressure along with pachymetry to calculate corneal thickness corrected/ compensatedintraocular pressure (IOP).
TECHNICAL SPECIFICATIONS	
1. Non contact with measurable range 5 to 50 mmHg or better in 1mmHg step. 2. Equipped with an optical Pachymetry function. 3. Automatic Calculation of Compensated IOP	
Accessories : 1. With standard accessories, safety locks and built in printer. 2. With locally made motorized table	

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**DIAGNOSTIC LENSES**
Clinical Purpose	Diagnostic/Examination of Eye.
TECHNICAL SPECIFICATIONS	
60 D, 78, 90, digital wide field, super field, 3 mirror, indentation gonio lens (End User to specify quantity and type)	

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**PERKINS TYPE HANDHELD TONOMETER**
Clinical Purpose	Diagnostic. For measurement of intraocular pressure in children.

TECHNICAL SPECIFICATIONS

1. Applanation tonometer for IOP.
2. Hand held type.
3. Double prism interchangeable.
4. Compact light weight.
5. Built in illumination.
6. Scale range of 1 to 60 mmHg.
7. Direct reading on dial scale
8. Cobalt filter

ACCESSORIES:

1. With two prisms and two calibration weights.
2. Complete in case.
3. Dry battery cell/ Rechargeable battery operated.

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**COLOUR VISIONTESTING CHART (ISHIHARA)**
Clinical Purpose	Diagnostic/Examination of Eye.

TECHNICAL SPECIFICATIONS

1. Ishihara type.
2. The test to consist of 24 plates or more to be used to test for congenital colour blindness.
3. Each plate to present a design consisting of numeralsand winding lines formed by coloured dots with a background of coloured dots, the plates to be numbered and to be supplied with a protective cartonand an instruction book

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**COLOUR VISION TEST(Quantitative Measurement)**
Clinical Purpose	Diagnostic/Examination of Eye.
TECHNICAL SPECIFICATIONS	
16 panel type. The test to consist of 16 color blocks or more to be used to test for congenital color blindness.	

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**EXOPHTHALMOMETER**
Clinical Purpose	Diagnostic. To check protrusion of eye.
TECHNICAL SPECIFICATIONS	
Hertel type exophthalmometer to have a scale to measure the distance between the lateral canthi and a scale on either side to measure the protrusion of each eye.	

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**MADDOX ROD**
Clinical Purpose	Diagnostic/Examination of Eye
TECHNICAL SPECIFICATIONS	
Franceschetti Phoria test/Maddox. Franceschetti Maddox rod	

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**PRISMS SET LOOSE**
Clinical Purpose	Diagnostic/Examination of Eye
TECHNICAL SPECIFICATIONS	
0.5, 1, 2, 3, 4, 5, 6 7, 8, 9, 10, 12, 14, 16, 18, 20, 25, 30, 35, 40, 45, 50D, red filter. To be supplied in a case	

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**BJERRUM SCREEN 2M**
Clinical Purpose	Diagnostic/Examination of Eye

TECHNICAL SPECIFICATIONS

1. Screen to be made of best quality lack velour cloth.
2. To be supplied on a spring roller so it may be retractedwhen not in use.
3. To be supplied complete with Traquair targets for use with the screen in red-green and bluewhite discs and a long handle all in a case

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**HESS SCREEN WITH CHIN REST**
Clinical Purpose	Diagnostic/Examination of Eye
TECHNICAL SPECIFICATIONS	
Unit to consist of a screen, which incorporates the original Hess pattern. To be supplied with Diplopia goggles, a torch and then by using these in association with the screen. For diagnosis of eye dissociation.	

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**LEE'S SCREEN WITH CHIN REST**
Clinical Purpose	Diagnostic/Examination of Eye
TECHNICAL SPECIFICATIONS	
Unit to consist of a screen, which incorporates the original Lee's pattern. To be supplied with standard accessories.	

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**STEREO TEST WIRT FLY**
Clinical Purpose	Diagnostic/Examination of Eye
TECHNICAL SPECIFICATIONS	
Stereo testwirt fly with 3D Spectacles.	

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**FRISBY STEREO TEST**
Clinical Purpose	Diagnostic/Examination of Eye
TECHNICAL SPECIFICATIONS	
Frisby stereo test.	

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**MADDOX WING**
Clinical Purpose	Diagnostic/Examination of Eye
TECHNICAL SPECIFICATIONS	
Hand held wing test used for testing for the detection and measurement of heterophoria. Metal construction with arrow and scale.	

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**VISION TESTING BOX FOUR SIDED WALL MOUNTED (SNELLENS)**
Clinical Purpose	Diagnostic/Examination of Eye
TECHNICAL SPECIFICATIONS	
Four Sided Rotatable Testing box to be wall mounted, to be supplied with the following panels, 1 English alphabet 1 illiterate “E”, 1 Urdu alphabet 1 K pictures To be manually controlled	
Accessories: Reflecting Mirror to use at half distance.	

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**CHART PROJECTOR**
Clinical Purpose	Diagnostic/Examination of Eye

TECHNICAL SPECIFICATIONS

1. With 20 charts or better including masks
2. Pictures for children
3. Number and letters with cordless remote control
4. Metal Wall Screen
5. Illumination LED / Halogen

ACCESSORIES:
Screen with 01 spare bulb (in case of Halogen)

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**LCD/LED VISION CHART**
Clinical Purpose	Diagnostic/Examination of Eye
TECHNICAL SPECIFICATIONS	
19 inch or better Vision charts, Contrast sensitivity charts, color vision chart, pediatric vision charts Number and letters with cordless remote control	

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**NON CONTACT/OPTICAL BIOMETER**
Clinical Purpose	Diagnostic/Examination of Eye

TECHNICAL SPECIFICATIONS

1. Noncontact measurements
2. Precise axial length values along the visual axis, independent of pupil size
3. Measures myopes, aphakes, pseudophakes and silicone-filled eyes
4. Automatic right / left eye recognition
5. Axial length measurement
6. Keratometry/Corneal radius
7. Anterior chamber depth
8. Standard Formulae for IOL calculation
9. Data export to CD-RW / USB flash drive

ACCESSORIES:

1. With imported motorized table from USA / Europe / Japan.

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**NON MYDRIATIC FUNDUS CAMERA**
Clinical Purpose	Diagnostic/Examination of Eye

TECHNICAL SPECIFICATIONS

1. Type: Non Mydriatic
2. Picture angle: 45 degree.
3. Working distance: 30 mm or above.
4. Minimum Pupil Diameter: 4mm or better
5. Camera: Provided by the Manufacturer.
6. Display: LCD

ACCESSORIES:

1. With original motorized table/Imported from Europe/Japan/USA.

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**HANDHELD SLIT LAMP**
Clinical Purpose	Diagnostic/Examination of Eye

TECHNICAL SPECIFICATIONS

1. With stereo microscope
2. Magnification: 10X and 16X
3. Variable slit
4. Standard filters
5. Power supply unit

ACCESSORIES:

1. With rechargeable battery pack
2. Complete with carrying case

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**ULTRASONIC PACHYMETRY**
Clinical Purpose	Diagnostic. To determine thickness of cornea.

TECHNICAL SPECIFICATIONS

1. Providing corneal thickness measurements
2. Microprocessor controlled electronics
3. Audible beep on proper positioning
4. Corneal thickness averaging based on multiple measurements

ACCESSORIES:
Solid probe
Printer

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**A&B SCAN WITH BIOMETRY & PACHYMETERY**
Clinical Purpose	Diagnostic. Retinal diseases, intraocular lens power calculation& corneal thickness measurement

TECHNICAL SPECIFICATIONS

1. A&B modes with control vector and biometric ruler with computer to calculate IOL power.
2. Digital Memory and image freezing.
3. Ultrasonic bio-meter for manual or automatic freezing system via foot pedal when valid measurement is detected.
4. Measurement of axial length, ACD and lens thickness, features measurement of 5 or more reading with adjustable gates/Gain.
5. Standard deviation of multiple scans, fully digitized display of real time echograms.
6. Solid probe with fixation light.
7. Audio feedback for probe alignment.
8. With standard formulae.
9. LCD /LED/TFTmonitor alphanumeric or analog display of overall gain.
10. Near field and dynamic setting.
11. Depth of examination 35mm or better.
12. In B mode scanning angle 40 degree or more.
13. 10 MHz or better B Probe.
14. 10 MHz or better biometry probe.
15. Pachymetery probe providing corneal thickness measurements
16. Audible beep on proper positioning
17. Corneal thickness averaging based on multiple measurements

Accessories :

With compatible laser printer and one extra toner.

Local trolley / stand

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**DIGITAL LENSMETER**
Clinical Purpose	Diagnostic. For measurement of power of spectacle lenses.

TECHNICAL SPECIFICATIONS

1. Type: Auto Display on LCD
2. Vertex power range: 0 to +/-25D
3. Step 0.25D
4. Cylindrical axis: 0 to 180°
5. Prismatic power range: 9 prism D or better
6. Electrically 220V, 50H
7. Built-in Printer
8. Optical marker

Clinical Specialty	Ophthalmology
Generic Name	**HAND HELD TONOMETER (TONOPEN TYPE)**
Clinical Purpose	Therapeutic, Used in glaucoma management.
TECHNICAL SPECIFICATIONS	
With measurable pressure range 7 to 50mm Hg or better	
ACCESSORIES: Standard Accessories	

Clinical Specialty	Ophthalmology
Generic Name	**CRYOSURGICAL UNIT**
Clinical Purpose	Therapeutic/Surgery of Eye

TECHNICAL SPECIFICATIONS

1. Console with foot switch
2. Pressure regulator
3. Pressure gauge
4. Temperature Display
5. Non-electric defrost
6. On/off pedal switch
7. Can be used on CO_2 or nitrous oxide gas
8. Filter
9. And attachments such as connecting hose and reducer.
10. Retina (02 Pieces)and Glaucoma (01 Pieces) probes with tubing.

Clinical Specialty	Ophthalmology
Generic Name	**LOUPES (OPERATING)**
Clinical Purpose	Diagnostic/Examination of Eye
TECHNICAL SPECIFICATIONS	
1. Spectacle / Head mountedloupe (End user to specify) 2. 2.5 x and above	

Clinical Specialty	Ophthalmology
Generic Name	**LOUPES WITH LIGHT**
Clinical Purpose	Diagnostic/Examination of Eye
TECHNICAL SPECIFICATIONS	
Spectacle / Head mountedloupe with light (End user to specify) 2.5 x and above Rechargeable Battery Pack	

Clinical Specialty	Ophthalmology
Generic Name	**HAND HELD AUTO REFRACTOMETER WITH KERATOMETER**
Clinical Purpose	Diagnostic. To determine the refractive error of the eye and power.

TECHNICAL SPECIFICATIONS

1. With auto measurement & printout with standard accessories.
2. Measuring range: Spherical: ±17D or better.
3. Cylinder: ±6 D or better.
4. Axis: 1 to 180 degree.
5. Display: LCD monitor
6. MEASUREMENT OF RADIUS OF CURVATURE
7. Radius of curvature 5.00 to 11.00 mm (in 0.01mm increment)
8. Corneal astigmatism in 0.25D increment
9. Cylinder Axis 1° to 180°
10. Electric power: 220-240V AC, 50Hz.
11. Rechargeable battery workstation

Accessories
Carrying Case

Clinical Specialty	Ophthalmology
Generic Name	**SPECULAR MICROSCOPE**
Clinical Purpose	Diagnostic/Examination of Eye.

TECHNICAL SPECIFICATIONS

1. Acquisition mode: Non-contact, automatic
2. Picture size: 0.25 mm x 0.50 mm or better
3. Measurement accuracy: ±10 µm
4. LCD screen: 8.4" or better
5. User interface: Touch-screen
6. Voltage supply: 230V-240V ac ±10% / 50 Hz, 60 Hz

ACCESSORIES:
With printer and Local made motorized table.

Clinical Specialty	Ophthalmology
Generic Name	**CONTRAST SENSITIVITY CHARTS**
Clinical Purpose	Diagnostic/Examination of Eye.

TECHNICAL SPECIFICATIONS

1. Cardiff Pediatric Contrast Sensitivity Test covers 12 contrast levels from 2.17 to 100.
2. Preferential Looking Test Hiding Heidi testing varying levels of 1.25%, 2.5%, 5%, 10%, 25% and 100%.
3. Pediatric and Adult Near Contrast Test Books testing 20/400 to 20/10 in 17 increments.
4. Low contrast flip charts various age groups.
5. Illuminated low vision test charts.

Clinical Specialty	Ophthalmology
Generic Name	**CORNEAL ANTERIOR AND POSTERIOR TOPOGRAPHY SYSTEM WITH BIOMETERY/ IOL CALCULATION**
Clinical Purpose	Diagnostic for corneal diseases, axial length measurement and intra-ocular lens calculator.

TECHNICAL SPECIFICATIONS

1. Topographical keratoconus detection
2. Topography and elevation maps of the anterior and posterior corneal surface
3. Pachymetry maps.
4. Refractive maps/ Corneal Maps
5. Pupil Diameter and horizontal white to white measurement
6. Comparison and differential analysis.
7. Scheimpflug/Slit scan/placido/ OCT based
8. Computer system originally supplied by manufacturer
9. Central corneal thickness
10. 110-230 V, 60/50 Hz.
11. DICOM / Networking Compatible
12. Biometry/IOL Calculation
13. Standard Formulae for IOL calculation
14. USB / DVD-RW Drive

Accessories :

1. Color Laser/High photo quality inkjet printer with one extra toner set
2. With original motorized table/Imported from Europe/Japan/USA.

Clinical Specialty	Ophthalmology
Generic Name	**CORNEAL ANTERIOR TOPOGRAPHY SYSTEM**
Clinical Purpose	Diagnostic for corneal diseases

TECHNICAL SPECIFICATIONS

1. Topographical keratoconus detection
2. Topography and elevation maps of the anterior corneal surface
3. Refractive maps/Corneal Maps
4. Pupil diameter and horizontal white to white measurement
5. Comparison and differential analysis.
6. Scheimpflug/Slit scan/Placido / OCT based
7. Keratoscopic Cone
8. Cornea Coverage: Up to 9.8 mm or better
9. Power source: AC 100-240V 50/60 Hz
10. Computer system originally supplied by manufacturer
11. RAM: 2GB or better
12. Hard disk: At least 250 GB
13. USB

Accessories:

1. Standard Accessories
2. Local/ imported motorized table with stand.

Clinical Specialty	Ophthalmology
Generic Name	**DCR PHOTOCAGULATOR LASER**
Clinical Purpose	Lacrimal Drainage Surgery

TECHNICAL SPECIFICATIONS

1. Laser Wavelength: 810nm / 980nmor higher
2. Output Power: 8W or higher
3. Operating Mode: Pulsed, Single: 0.1 to CW or better
4. Beam Delivery: Through Fiber
5. Display: Color Touch Screen
6. Control: Foot switch
7. Cooling: Internal / Air
8. Aiming Beam: Red 635nm
9. 100-240V AC,
10. Manual Foot switch

Accessories:

DCR Probe

Local / imported motorized table with stand.

Clinical Specialty	Ophthalmology
Generic Name	**EXCIMER LASER**
Clinical Purpose	Refractive surgery

TECHNICAL SPECIFICATIONS

1. Microscope with magnification changer
2. Display for patient information system
3. HD Quality Integrated camera system / Camera with beam splitter,
4. Video Recording with standard output
5. Wavelength 193 nm
6. Ablation diameter 0.5 mm or better
7. Gaussian beam profile
8. Pulse duration 4 ns or better
9. Pulse frequency / repetition rate 250 Hz or better
10. Laser transmission
11. Scanning spot / parallel beam scanning excimer laser system
12. Synchronized / Active eye tracker and laser trigger.

Accessories:
Standard Accessories

Clinical Specialty	Ophthalmology
Generic Name	**FEMTO-SECOND LASER**
Clinical Purpose	Refractive surgery.

TECHNICAL SPECIFICATIONS

1. Laser Type & Mode: Fiber Laser / YAG Solid state.
2. Pulse Repetition Rate: 500 kHz or better.
3. Laser Pulse Duration: 500 fs.
4. Laser Wavelength: 1030 nm or higher.
5. Energy Per Pulse: 150 nJ or higher (on cornea).
6. Power Supply: 230 V ± 10% / 50/60Hz
7. Suitable for LASIK

Accessories:
Standard Accessories
Docking device
Femto
Laser Procedure Packs (Quantity 10)

Optional:
(End User to Specify)
Intra Corneal Ring / Module
Keratoplasty Module
Lenticular Extraction Modules
FLACS

Clinical Specialty	Ophthalmology
Generic Name	**FLASH AUTOCLAVE**
Clinical Purpose	Instrument Sterilization

TECHNICAL SPECIFICATIONS

1. Fully Automatic High Speed Flash Autoclave B class sterilization
2. of solid, wrapped and unwrapped instruments
3. Capacity 15 liter or better
4. Sterilizing Temperature 134^{o}C
5. Rapid Sterilization
6. Dry Mode

Accessories:

1. Two-sided tray holder
2. Special tray holder
3. Trays with cover
4. Built-in Printer

Clinical Specialty	Ophthalmology
Generic Name	**FULLY AUTOMATED BINOCULAR OBJECTIVE/SUBJECTIVE REFRACTIVE SYSTEM**
Clinical Purpose	Refraction

TECHNICAL SPECIFICATIONS

Objective measurement Refraction:

1. Spherical refractive power -25D to +22D 1 or better
2. Cylindrical refractive power 0D to ±10D 1 or better
3. Cylinder axial angle 1° to 180° or better

Corneal curvature:

4. Corneal curvature radius 5.00mm - 10.00mm or better
5. Corneal refractive power 67.50D - 33.75D or better
6. Minimum measurement unit
7. Spherical/cylindrical refractive power 0.12D
8. Cylinder axial angle 1°
9. Corneal curvature radius 0.01mm
10. Corneal refractive power 0.12D
11. Display of measured value Displayed on the screen of the operation controller
12. Minimum measurable pupil diameterϕ2.0mm
13. PD measurement range 50mm - 80mm
14. Minimum PD measurement unit 0.5mm

Subjective measurement Refraction range:

15. Spherical power/ADD/ Cylindrical power
16. -18.00D ≤Equivalent spherical power â‰¤ +18.00D
17. -8.00D ≤Cylindrical power ≤0.00D
18. Cylinder axial angle 1° - 180°
19. Horizontal prism ±15.0
20. Vertical prism ±5.0
21. Minimum measurement unit
22. Spherical/ADD refractive power 0.25D
23. Cylindrical refractive power 0.25D
24. Cylinder axial angle 1°
25. Prism refractive power 0.1
26. Visual acuity measurement range 0.05 - 1.6 decimal
27. Power supply AC100 - 240V 50-60Hz
28. Binocular Autorefraction / keratometry and visual acuity system with objective / subjective testing through automated phoropter
29. Built-in Thermal Printer / external printer, Data Output

Accessories:

Standard Accessories

Clinical Specialty	Ophthalmology
Generic Name	**HANDHELD VISUAL ELECTRODIAGNOSTIC SYSTEM**
Clinical Purpose	Diagnostic, Electro-Physiology of the retina.

TECHNICAL SPECIFICATIONS

1. Comprehensive electrophysiology testing for Pediatric and Adult patients
2. Standard flicker and flash ERGs and VEPs to better define retina function
3. Portable, handheld, full field flash ERG and VEP testing device
4. Integrated age-adjusted normative data provide valuable input to physicians
5. DR protocol to make testing for diabetic retinopathy
6. Sensor Strip electrodes for patient comfort
7. Non-mydriatic testing by adjusting light levels based on pupil size with real-time pupillography.
8. Red LED, Green LED, Blue LED & White (RGB) light source
9. Li-Ion battery
10. Hand Held

Accessories:

1. ERG Electrode & Supply Kit
2. VEP Electrode & Supply Kit
3. Laptop system with Printer

Clinical Specialty	Ophthalmology
Generic Name	**ADVANCED PHACO UNIT**
Clinical Purpose	Cataract Surgery

TECHNICAL SPECIFICATIONS

1. Main console with surgeon setting programming.
2. Phaco modulation choice of pulse and burst mode.
3. Vacuum 0-500 mmHg or better
4. Provision for 2.2 & 2.8 mm tips.
5. Programmable foot pedal.
6. Peristaltic pump/Venturi.
7. Irrigation/ Aspiration and phaco emulsification hand pieces
8. I/A collection cassette or bag (Quantity 3) or Reusable bottle / container (Quantity 3)
9. I/A test chamber (Quantity 10)
10. Irrigation sleeves (Quantity 10)
11. Phaco needle 30 deg bevel round (Quantity 3) and Bend tip (Quantity 3), Wrench for tightening needle (Quantity 3).
12. Disposable anterior vitrectomy cutter, cut rate 1000 or better(Quantity3)
13. Phaco hand piece (Quantity 2) with sterilization box
14. Optical/ Microprocessor Controlled pressure sensors for accurate monitoring the Irrigation and aspiration flow
15. **Electrical Feature:**
16. AC Electrical Requirements:
17. Input Voltage: 100 - 240 VAC 50 / 60 Hz
18. **Operating Mode:**
19. Phacoemulsification technology: "Torsional" /Longitudional / both
20. Resonant Frequency: 32.0 kHz ± 2.0 kHz or better

Accessories:

1. Cassette (FMS)
2. Phacohandpiece
3. Phaco Tip
4. Phaco sleeves
5. Anterior vitrectomyHandpiece
6. Original cart /trolley with motorized bottle height control

Clinical Specialty	Ophthalmology
Generic Name	**LOW VISION KIT**
Clinical Purpose	Low vision assessment

TECHNICAL SPECIFICATIONS

1. LEA Symbols low vision book
2. Twin-lux LED stand magnifier
3. Sempral Round hand magnifiers 2.5x / 3x / 4x / 5x / 6x / 8x / 10x
4. Vision Simulator glasses for combined loss, central loss, peripheral loss, over all blur, hemi field loss, low contrast and color deficiency
5. Okolux stand magnifiers with clear white light 4500k SMD LED's magnification 3.5x, 4x, 5x, 6x, 7x, 8x, 10x, 13x, 15x
6. Low vision diagnostic tool with 2-sided reading test card and 15 low vision passport guides
7. Compact mini electronic video magnifier with rechargeable battery, auto shut off and carrying case.
8. 3.5" color LCD with adjustable magnification 2x – 11x
9. Power telescope mini monocular achromatic for both distance and near focus viewing 2.5 x 25, 4 x 12, 6 x 12

Clinical Specialty	Ophthalmology
Generic Name	**DACRYOCYSTORHINOSTOMY SET WITH HD CAMERA SYSTEM**
Clinical Purpose	Lacrimal Surgery

TECHNICAL SPECIFICATIONS

Straight Forward Telescope 0°, enlarged view, diameter 4 mm, length 18 cm, autoclavable, fiber optic light transmission incorporated,
Forward- Oblique Telescope 45°, enlarged view, diameter 4 mm, length 18 cm, autoclavable. Fiber optic light transmission incorporated.

Eye motor control unit with:

Touch screen color display
power supply 100-240 VAC, 50/60 Hz,
Mains Cord
Two-Pedal Foot switch
Single Use Tubing Set (sterilize, Quantity 03)
Can be used as Eye Drill, Micro Saw, Dermatome with attachments
Automated motor recognition
Continuously adjustable speed Range
Integrated irrigation pump
Two motor connections.
Motor for Drill hand pieces with:
connecting cable
Self Cooling
Brush less
Autoclavable,
Torque 4N cm or more
Drill Hand piece, straight and angled (One Each), length 18 cm, transmission 1:1 (40,000 rpm), for use with high-performance micro motor and straight shaft burrs
Diamond Straight Shaft Burr, stainless, length 12.5 cm, sizes 014- 070, set of 11
Sterlization Tray for Hand Pieces and Burrs
Diamond cutting burrs length 7 cm, set of 15 (Autoclavable)
Oscillating Micro Saw, built-in Irrigation Tube, recommended maximum speed 15000 rpm corresponds to 15000 oscillation / min without saw blades with fork wrench.
Saw Blades, short shaft, blade thickness 0.3mm, blade width 6mm, working 11mm.
Saw Blades, long shaft, blade thickness 0.3mm, blade width 6mm, working 11mm, length 26mm.
Micro Sagittal Saw, Built-in Irrigation Tube, recommended maximum speed 20000 rpm without saw blades with fork wrench.
Saw Blades, blade thickness 0.3mm, blade width 6mm, Working Length 10mm.
Saw Blades, blade thickness 0.3mm, blade width 12mm, Working Length 27mm.

Endoscopic video unit with:

HD camera Unit include LED light source technology
Integrated digital Image Processing Module
18.5" Touch screen monitor

power supply 100 - 240 VAC, 50/60 Hz Internal Storage 50GB Should contain 2 camera connectors for different camera heads Resolution 1920x1080 USB Silicone Keyboard with Touch pad 8GB USB Mains Cord **High definition Camera Head with:** 02 freely programmable Camera Head buttons Resolution 1920x1080 Fiber Optic Light Cable with: straight connector extremely heat-resistant.
Accessories: Sterilization and storage Container system complete set for Endoscopes, Extra Bulb (01) Spray for cleaning hand piece (Locally Supply) Sterilization Container
Optional: Tungsten Carbide Shaft Burrs, stainless, sizes 006-070, length 7 cm, set of 15 (Autoclavable) 450 GB Hard Drive (Standalone or built-in) Medical Grade Digital Video HD Touch Screen Recorder

Clinical Specialty	Ophthalmology
Generic Name	**OPTICAL COHERENCE TOMOGRAPHY WITH OCTANGIOGRAPHY**
Clinical Purpose	Diagnostic for retina, glaucoma and cornea. Imaging of retinal blood vessels without the use of contrast agent.

TECHNICAL SPECIFICATIONS

1. Scan modes : Confocal/LSO /SLO/ Swept source /live OCT fundus / fundus image
2. Scan speed : Min 50,000 A-Scan / sec or more
3. Including Optic Nerve Head Analysis, Macula
4. Anterior Segment : With Anterior Segment Module
5. Computer: Originally Supplied by the manufacturer.
6. High resolution OCT-Angiography
7. With standard software

Accessories:
Color laser printer with one extra toner set
With original motorized table/Imported from Europe/Japan/USA

Clinical Specialty	Ophthalmology
Generic Name	**OPTHALMIC UNIT WITH HYDRAULIC CHAIR,MOVEABLE TABLE & CHART PROJECTOR**
Clinical Purpose	Complete patient examination system for installation of slit lamp and auto refractometer etc.

TECHNICAL SPECIFICATIONS

1. Built-in DC power supply for any two instruments like Auto Refractometer& Slit Lamp etc.

2. Right- or Left- handed onsite setup
3. Rotation / Sliding mechanism for table top with centering of the equipment to patient
4. Overhead LED lamp
5. Chart projector support
6. Electrically elevated chair
7. Armrest
8. Foldable foot support
9. Reclineable / Rotatable Chair allowing for a patient examinations with additional diagnostic devices from the side

Accessories:
Local / Imported Doctor stool with pneumatic height control

Clinical Specialty	Ophthalmology
Generic Name	**ORTHOPTIC SET**
Clinical Purpose	Orthoptic assessment of Squint.

TECHNICAL SPECIFICATIONS

1. LEA Near Vision Screener
2. LEA Distance Vision Screener
3. LEA Low Contrast Grating Acuity Test
4. Panel 16 Quantitative Color Vision Test
5. Cardiff Pediatric Acuity Test
6. Multiple Pinhole Occluder
7. Worth Four dot Flashlight with anaglyph glasses
8. Risley Rotary Prism
9. Bagolini striated lenses
10. Tangent Screen to assess central / peripheral FoV
11. OKN Drum
12. Red-Green Anti suppression goggles
13. Cambridge Crowding Cards test for pre-school children
14. Ffooks symbols test type
15. Kay 3 meter crowding book
16. Sheridan Gardiner Test Comprehensive
17. Hertel'sexophthalmometer with mirrors
18. Pair of retinoscopy racks ± 0.50 D to 15D
19. Lang stereo test / Frisby stereo test
20. Wirt fly test with polarized spectacles
21. Franceschetti's Maddox Rod
22. Maddox Wing Test
23. RAF Binocular Gauge
24. Prism Bars Vertical 1 – 30D

Clinical Specialty	Ophthalmology
Generic Name	**REFRACTIVE UNIT/ AUTO PHOROPTER**
Clinical Purpose	Determination and refractive state of the eye

TECHNICAL SPECIFICATIONS

1. Spherical power: -27.00D to +27.00D (0.12D, 0.25D, 0.50D, 1.00D)
2. Cylindrical power: 0D to ±6.00D (0.25D, 1.00D)
3. Axis: 0 degree to 180 degree (1 degree, 5 degree)
4. Interpupillary Distance: 48.0mm to 80.0mm (0.5mm to 1mm)
5. Vertex Distance: 12, 13, 16mm
6. Cross Cylinder: Auto cross cylinder (±0.25D)
7. Auxiliary Lens: P.D, occluder, formanious board, polarization filters , Red maddox , R/G filter, Dispersing prism.
8. Printer
9. Monitor: 10 inch touch screen LCD monitor or better

Accessories:
Standard Accessories

Clinical Specialty	Ophthalmology
Generic Name	**SELECTIVE LASER TRABECULOPLASTY (SLT)**
Clinical Purpose	Treatment of glaucoma.

TECHNICAL SPECIFICATIONS

1. Wavelength: Green 532 nm
2. Energy: 0.2 to 2 mJ or better
3. Pulse duration: 2 ns or better
4. Repetition rate: 1 Hz or better
5. Pulse mode: Single pulse
6. Magnification: According to type of slit lamp
7. Cooling: Air cooled
8. Alongwith: Slit lamp with halogen/LED illumination

Accessories:

1. Application lens for Trabeculoplasty
2. With standard accessories
3. With Imported motorized stand.

Clinical Specialty	Ophthalmology
Generic Name	**SURGEON OPERATING CHAIR HYDRAULIC/ELECTRIC**
Clinical Purpose	Operating chair
TECHNICAL SPECIFICATIONS	
1. Hard and thick cushion 2. Simple elevating section 3. Armrest with cushion 4. Stable base section 5. Hydraulic / Electric Elevation	

Clinical Specialty	Ophthalmology
Generic Name	**PEDIATRIC RETINAL IMAGING CAMERA (WIDE ANGLE HAND HELD)**
Clinical Purpose	Wide field pediatric retinal imaging

TECHNICAL SPECIFICATIONS
1. Wide field fundusimaging 2. Direct Illumination for high resolution and high contrast imaging 3. Real-time, on-screen zoom with ability to pan across the zoomed field of view 4. Fundus Light Source interchangeable LED light module in hand piece 5. Single lens provides 100-degree wide field of view for retina survey 6. 20'' or better HD touch Screen / LED / LCD 7. Retinal Imaging Camera 8. Standard Software
Accessories: Original Cart Hand piece
Optional: Fluoresceinangiographymodule

Clinical Specialty	Ophthalmology
Generic Name	**DRY EYE ANALYZER**
Clinical Purpose	Diagnostic for corneal diseases

TECHNICAL SPECIFICATIONS

1. Acquisition Mode (Photos and Video)
2. Automatic and manual focus
3. Infrared color camera
4. Infrared LED, White and Blue LED
5. Yellow filter
6. Meibomian glands, Lipid Layer, Aqueous layer, Evaluation of tear film break-
7. Up time non Invasive, fluorescein test, B.U.T., White to white Measurement.

ACCESSORIES:
Laser printer

OPTIONAL
Local motorized table

Clinical Specialty	Ophthalmology
Generic Name	**ELECTROPHYSIOLOGICAL DIAGNOSTIC SYSTEM**
Clinical Purpose	Electrophysiological investigation of the retina.

TECHNICAL SPECIFICATIONS

1. ForPattern VEP + Pattern ERG + Flash VEP + ISCEV
2. ERG + EOG slow +mfERG
3. Allows the objective functional evaluation of the visual system, in accordance with the SCEV standard (International Electrophysiology of Vision).
4. Ability to screen glaucomatous pathology in its earliest stages
5. Innovative device for the early detection of Glaucoma and monitoring of its progression
6. Useful for the functional assessment of retina and ganglion cells
7. Age correlated normative data base
8. Software for EOG, ERG standard, photopic, scotopic, Combined (photopic&scotopic), FlickerOscillatory potentials
9. PC24" Full HD control monitor
10. Monitor Stimulator unit:
11. High quality brand industrial PC-system
12. 18" or better TFT/LCD monitor
13. Pattern or strip position: full, half or quarter
14. Contrast controlled
15. Pattern reversal, appearance / disappearance
16. For work with children special pictures during the test
17. Eye fixation camerafor observation of the eye fixation of the patient during the examination
18. Ganzfeld:
19. Full field globe
20. All function full computer controlled, USB connection
21. Flash and Backlight with white LED
22. ON-OFF Response
23. Color Flash and Color Backlight with Blue-LED and Red-LED
24. Flash intensity from -45 dB to 0dB

ACCESSORIES:

1. Standard Accessories
2. Local motorized table
3. EEG electrodes (Quantity 05)
4. Set of ERG electrodes / DTL (Quantity 01)
5. EEG Gel (Quantity 01)
6. Electrode peeling nu-prep (Quantity 01)
7. Compatible Printer

Clinical Specialty	Ophthalmology
Generic Name	**CORNEAL CONFOCAL MICROSCOPE**
Clinical Purpose	Diagnostic Cornea and external ocular structures

TECHNICAL SPECIFICATIONS

1. Confocal scanning laser microscopy for high resolution images of the cornea and external optical structures
2. Navigate through the cornea at the cellular level with preferred scanning depth for a comprehensive in VIVO assessment of all corneal layers from epithelium to endothelium, including the quantitative assessment of endothelial cells
3. Acquire high resolution enface images of corneal cells and structures for diagnosis and follow up of corneal diseases and dystrophies
4. Customized acquisition modes
5. Transversal field of View: 300x300µm / 400x400mm
6. Focus adjustment ranges: 3 mm
7. Axial digital image size: 384x384 pixels
8. Optical resolution: approx. 2µm (transversal)
    i. approx. 4µm (longitudinal)
9. Digital resolution: approx. 1µm / pixel (transversal)
    i. approx. 2µm / pixel (longitudinal)
10. Analysis for Acanthamoeba Keratitis, Diabetic Neuropathy, Dendritic Cells, Fungal Keratitis,Fuchs Endothelial dystrophy, Semi-automated endothelial cell count, DemodexBlepharitis, Meibomian Gland dysfunction

ACCESSORIES:

Compatible Computer System with Printers

Original motorized table

Clinical Specialty	Ophthalmology
Generic Name	**ULTRAWIDE FIELD RETINAL IMAGING**
Clinical Purpose	Examination & photography of the retinal periphery.

TECHNICAL SPECIFICATIONS

1. Ultra Wide field Angle: 200 degree or better
2. Montage: 220 degree or better
3. Automatic focusing
4. Auto/Manual gain
5. Auto montage
6. Auto/Manual laterality
7. Auto fluorescence green/ blue
8. Stereo imaging
9. Light source: Red/Blue/green LED /Infrared/ Laser
10. Power: 220V, 50Hz AC.
11. Computer: Originally Supplied by the manufacturer.

Accessories:

1. Compatible Printer, local /Imported motorized table.

Optional:

1. FFA (End User to Specify)

Clinical Specialty	Ophthalmology
Generic Name	**OCT WITH ULTRAWIDE FIELD RETINAL IMAGING**
Clinical Purpose	Examination & photography of the retinal periphery.

TECHNICAL SPECIFICATIONS

1. Ultra Wide field Angle
2. Auto fluorescence green/blue
3. Light source: Red/Blue/green/LED /Infrared/ Laser
4. FFA/ICG
5. Power: 220V, 50Hz AC.
6. Computer: Originally Supplied by the manufacturer.
7. Scan modes : Confocal/LSO /SLO/ Swept source /live OCT fundus / fundus image
8. Scan speed : Min 50,000 A-Scan / sec or more
9. Including Optic Nerve Head Analysis, Macula

Accessories:

1. Compatible Printer
2. local /Imported motorized table.

Clinical Specialty	Ophthalmology
Generic Name	**SWEPT SOURCE OPTICAL COHERENCE TOMOGRAPHY (OCT)**
Clinical Purpose	Diagnostic for Retina glaucoma and corneal diseases.

TECHNICAL SPECIFICATIONS

1. Scan modes : Swept Source
2. Scan speed : Min 100,000 A-Scan/sec or more
3. Wave length: 1050 nm or more
4. Including Optic Nerve Head Analysis, Macula
5. Anterior Segment : With Anterior Segment Module
6. Computer: Originally Supplied by the manufacturer.

Accessories :
Color laser printer with one extra toner set
With original motorized table

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**HIGH END SLIT LAMP BIOMICROSCOPE WITH TEACHING AID**
Clinical Purpose	Diagnostic for examination of the eye and teaching of students simultaneously.

TECHNICAL SPECIFICATIONS

1. Binocular tube with vertical type eye width adjustment.
2. Illumination LED or Halogen.
3. Eyepieces with dioptric adjustment 10X to 16X any one pair.
4. Magnification range variable from 10x to 35x (5 steps or zoom).
5. Slit length: variable.
6. Tilt mechanism: 20 degree or better.
7. Slit image rotation: 0 to 180 degree .
8. Filters: Standard filters With hanging type applanation tonometer. with extra prism and calibration kit
9. Beam Splitter with teaching aid
10. Stereo variator for enhance retinal examination

Accessories:

1. With original motorized table/Imported from Europe/Japan/USA.
2. Dust cover
3. Chin rest papers
4. Breath shield
5. With extra 12 lamp only for Halogen illumination Slit lamp

PVMS OF MEDICAL EQUIPMENT	
Clinical Specialty	Ophthalmology
Generic Name	**SWEPT SOURCE NON CONTACT/OPTICAL BIOMETER**
Clinical Purpose	Diagnostic/Examination of Eye

TECHNICAL SPECIFICATIONS

1. Scanning Method: Swept Source
2. Noncontact measurements
3. Precise axial length values along the visual axis, independent of pupil size
4. Measures myopes, aphakes, pseudophakes and silicone-filled eyes
5. Automatic right / left eye recognition
6. Axial length measurement
7. Keratometry/Corneal radius
8. Anterior chamber depth
9. Standard Formulae for IOL calculation
10. Data export to CD-RW / USB flash drive

ACCESSORIES:

1. With imported motorized table from USA / Europe / Japan.

SPECIALIZED HEALTH CARE AND MEDICAL EDUCATION DEPARTMENT **GOVERNMENT OF THE PUNJAB**	Health Department
PRODUCT VOCABULARY MEDICAL STORE(PVMS) OF OT AND GENERAL SURGERY EQUIPMENT	**VOLUME -II 2021**

CONTENTS:		
SR. NO	**ITEMS NAME**	**PAGE NO.**

45.	PATIENT TRANSFER BOARDS	74
46.	ULTRASONIC SURGICAL ASPIRATOR	75
47.	SURGICAL ROBOTIC SYSTEM	76-79
48.	LAPAROSCOPIC VIRTUAL REALITY SIMULATOR	80-81
49.	SMOKE EVACUATOR	82
50.	BIO-DECONTAMINATION SYSTEM	83

Note: The minor variation in sizes would be acceptable and shall not be considered as reason of rejection. If any clarification required the procuring agency can write down to the convener of PVMS committee.

Clinical Specialty	Operation Theater and General Surgery
Generic Name:	**Trolley for patient transport / patient Shifting trolley**
Clinical Purpose	Transport of patient from theatre to ward and vice versa

Technical Specifications:

2-3 Section Patient Shifting Trolley.

Telescopic or Actuator or Hydraulic Column Mounted System.

Radiolucent top.

Height Adjustment from 600 to 850 mm or more

Back section should be adjustable from 0 – 70 Degree Approx.

Should have Trendelenburg and Revere Trendelenburg positions +12 and -12 degree approx. or better.

Wire basket or Space for patient belonging.

4 Bumper at all corner to protect trolley.

Patient Safe Working Load capacity min 250 kg or more.

Accessories:

1. IV rod.
2. Monitor Shelf.
3. Oxygen Cylinder Holder.
4. Fifth Wheel for straight drive during the patient shifting.
5. X-Ray Cassette holder.
6. Collapsible Side Rail.

Clinical Specialty	Operation Theater and General Surgery
Generic Name:	**HEAVY DUTY SUCTION MACHINE**
Clinical Purpose	Heavy duty suction machine is used to keep the airways clean and in operation theater for suction of various secretions/fluids from various cavities of body.

Technical Specifications:

Piston or Diaphragm type with oil free pump mechanism.

Heavy duty Mobile Suction Unit with twin jars (Polysulfide or Polycarbonate type) of capacity up to 4 or 5 liter each, Autoclavable.

Aspiration rates up to 40-60 liters/minutes or more at 640-900mm.Hg

Vacuum continuously adjustable

Triple or Over flow safety device.

Change over valve

Suction tubing of silicone with coupling connection for each jar

Noise Level 50 dB or less.

220V/50Hz.

Accessories:

1. 50 x Hydrophobic/bacterial filter
2. trolley with lockable wheels.

Clinical Specialty	Operation Theater and General Surgery
Generic Name:	**LIGHT DUTY SUCTION MACHINE**
Clinical Purpose	Light duty suction machine is used to keep the airways clean and in operation theater for suction of various secretions/fluids from various cavities of body.

Technical Specifications:

Piston or Diaphragm type with oil free pump mechanism.

Heavy duty Mobile Suction Unit with twin jars (Polysulfide or Polycarbonate) of capacity up to 2 or 3 liters each, Autoclavable.

Aspiration rates up to 20-30 liters/minutes or more at 600-900mm.Hg

Vacuum continuously adjustable

Triple flow or over flow safety device.

Change over valve

Suction tubing of silicone with coupling connection for each jar

Noise Level 50 dB or less.

220V/50Hz.

Accessories:

1. 10 x bacterial filter
2. Original trolley with lockable wheels.

Clinical Specialty	Operation Theater and General Surgery
Generic Name:	**MULTIPURPOSE HYDRAULIC OPERATION TABLE**
Clinical Purpose	Operating Tables used to conduct the different kind of surgical interventions of patients, the dedicated tables provide all the positions required by the surgeon.

Technical Specifications:

Table Top (Radiolucent) with antistatic mattress 4-5 sections and equipped with X-ray cassette holder.

Patient weight bearing capacity: 180 Kg or more.

TABLE TOP IS ARRANGED AS:

- Head plate
- Back plate
- Seat plate
- Two separate leg plates.
- Base of the table stainless steel or ABS Cover.

MOVEMENT:

- Height Adjustment 720-1000mm or better ±- 15mm
- Provision of Kidney Position.
- Trendelenburg and Reverse Trendelenburg 25 and 18 degrees respectively.
- Lateral tilt 20 degree
- Back plate: 65 degree and -30 degree
- Manual Leg plate movement: up to 15 degree and down to 90 degrees.

Accessories:

1. Pair of Arm rest with clamp and strap.
2. Anesthesia screen
3. Large width body strap
4. Adjustable bottle holder rod.
5. Pair of Knee Crutches or Equivalent.

Optional (ACCESSORIES): End-user to specify.

ORTHOPAEDIC ACCESSORIES:

Stainless steel or carbon coated (I/O to Specify)

- Leg traction device with boots, straps etc.

 Accessory trolley.

 Orthopedic Attachment with boots for adult and Paeds for both legs.

NEUROSURGERY ACCESSORIES:

 Wilson frame complete with patient care kit

o Can be used on any general surgical table

o Allows 360-degree unrestricted radiolucency

o Allows unrestricted C-arm access

 Head Frame with following accessories

o Basal frame complete with skull clamp system with adult & pediatric skull pins or equivalent.

Head frame for neurosurgery with following accessories.

O Quarter frame

o Slide Adjuster for retractor

o Head holder with standard head pins

o Table attachment

o Spatula 6 mm & 4 mm or equivalent

OPHTHALMOLOGY/ENT ACCESSORIES

 Eye/ ENT head rest.

UROLOGY ACCESSORIES

 Liquid Basin

 Accessories trolley

Clinical Specialty	Operation Theater and General Surgery
Generic Name:	**ELECTRO-HYDRAULIC/ELECTRO-MECHANICAL OPERATION TABLE**
Clinical Purpose	Operating Tables used to conduct the different kind of surgical interventions of patients, the dedicated tables provide all the positions required by the surgeon.

Technical Specifications:

Weight bearing capacity of 250kg or more

5 Sectional operation Table with two leg section.

Table top equipped with radiolucent material.

The mattress covers with washable, antistatic material.

X-ray Cassette holder for X-Ray and C-Arm facility

Sliding table top at least 250mm or more

Electric Height adjustment: 730 to 1000 mm or more.

Electric Trendelenburg and Reverse Trendelenburg: 25° degree and -25° or better.

Electric lateral tilt: 30° degree and -30° degree or better.

Manual or electric backrest adjustment:70° degree and -15° degree or better. (Both are acceptable)

Manual leg section adjustment: 20° degree and -90° or better.

220-230 V, 50 Hz.

Hand control unit.

Override panel in the column or Wireless remote for back up control in emergency cases.

Battery backup control of table in case of main power failure.

Accessories:

1. Pair of Arm rest with clamp
2. Anesthesia screen
3. Large width body strap
4. Adjustable bottle holder rod
5. Shoulder support
6. Pair of Knee Crutches.
7. Lateral Support.

Optional (ACCESSORIES): End-user to specify.

Kidney Elevator.

ORTHOPAEDIC ACCESSORIES:

 Stainless steel or carbon coated (I/O to Specify)

 Leg traction device with boots, straps etc.

 Accessory trolley.

 Orthopedic Attachment with boots for adult and Paeds for both legs.

NEUROSURGERY ACCESSORIES:

 Wilson frame complete with patient care kit

o Can be used on any general surgical table

o Allows 360-degree unrestricted radiolucency

o Allows unrestricted C-arm access

 Head Frame with following accessories

o Basal frame complete with skull clamp system with adult & pediatric skull pins or equivalent.

Head frame for neurosurgery with following accessories.

o Quarter frame

o Slide Adjuster for retractor

o Head holder with standard head pins

o Table attachment

o Spatula 6 mm & 4 mm or equivalent

OPHTHALMOLOGY/ENT ACCESSORIES

 Eye/ ENT head rest.

UROLOGY ACCESSORIES

- Liquid Basin

Clinical Specialty	Operation Theater and General Surgery
Generic Name:	**High End Electrohydraulic / Electromechanical Table**
Clinical Purpose	Operating Tables used to conduct the different kind of surgical interventions of patients, the dedicated tables provide all the positions required by the surgeon.

Technical Specifications:

Table Top (Radiolucent) With antistatic mattress, 5-6 sections and equipped with X-ray cassette holder.

Sturdy table for minimum patient lifting capacity 450Kg or better.

TABLE TOP IS ARRANGED AS:

- Head plate
- Back plate
- Seat plate
- Two separate leg plates
- Base of the table stainless steel or ABS cover, 4 swivel castors
- Sliding table top up to 300 mm

MOVEMENT (Remote Controlled):

- Up and down movement height range: 680-1000mm or more
- Trendelenburg and Reverse Trendelenburg 30 degree and -20 degree
- Lateral tilt 20^{o}
- Back plate: up 70^{o} degree Down 35^{o}degree or better
- Leg plate: up 20^{o} and down 90^{o} degree.
- Override panel in column or wireless remote for back up in case of emergency.
- Operating Voltage: 220V, 50Hz with battery backup in case of electric supply failure.
- Provision of kidney position.

Accessories:

STANDARD ACCESSORIES:

- Pair of Arm rest with clamp and straps.
- Anesthesia screen
- Pair of Knee Crutches.
- Large width body strap
- Adjustable bottle holder rod
- Shoulder support

▯ U Shape head rest for general Surgery.
Optional: IO to specify **ORTHOPAEDIC ACCESSORIES:** ▯ Stainless steel or carbon coted (I/O to Specify) ▯ Leg traction device with boots, straps etc. ▯ Accessory trolley. ▯ Orthopedic Attachment with boots for adult and Paeds for both legs. **NEUROSURGERY ACCESSORIES:** ▯ Horse shoe head rest ▯ Multi poise head rest ▯ Frontal sitting attachment ▯ Posterior sitting attachment **OPHTHALMOLOGY/ENT ACCESSORIES** ▯ Eye/ ENT Head rest for pediatric /adult (As per requirement) IO to specify **UROLOGY ACCESSORIES** ▯ Liquid basin

Clinical Specialty	Operation Theater and General Surgery
Generic Name:	**CEILING OT LIGHT SINGLE HEAD**
Clinical Purpose	OT Light is a medical device intended to assist medical personnel during a surgical procedure by illuminating a local area or cavity of the patient

Technical Specifications:

LED shadow less operation theatre ceiling light, hermetically sealed dust proof.

Adjustable light intensity 160000 LUX at 1 meter distance.

Color temperature 4000°-4500° Kelvin.

Electronic control panel for light Parameter's adjustment.

Color rendition index of 96 or more.

LED life 50,000 hours or better.

Autoclavable handles.

Operating Voltage 220V, 50Hz.

Accessories:

1. Online Pure sine wave UPS imported for two hours minimum backup to be supplied locally.

Clinical Specialty	Operation Theater and General Surgery
Generic Name:	**CEILING OT LIGHT DOUBLE HEAD**
Clinical Purpose	OT Light is a medical device intended to assist medical personnel during a surgical procedure by illuminating a local area or cavity of the patient

Technical Specifications:

LED shadow less operation theatre ceiling light, hermetically sealed dust proof.

Adjustable light intensity 160000 LUX at 1 meter distance.

Satellite combination of 160000 LUX at 1 meter.

Color temperature 4000°-4500° Kelvin.

Electronic control panel for light Parameter's adjustment.

Color rendition index of 96 or more.

LED life 50,000 hours or better.

Autoclavable handles.

Operating Voltage 220V, 50Hz.

Accessories:

1. UPS imported for two hours minimum backup but supply locally.

Clinical Specialty	Operation Theater and General Surgery
Generic Name:	**CEILING OT LIGHT DOUBLE HEAD WITH INTEGRATED CAMERA**
Clinical Purpose	OT Light is a medical device intended to assist medical personnel during a surgical procedure by illuminating a local area or cavity of the patient

Technical Specifications:

LED shadow less operation theatre ceiling light, hermetically sealed dust proof.

Adjustable light intensity 160000 LUX at 1 meter distance.

Satellite combination of 160000 LUX at 1 meter.

Adjustable Color temperature 4000°-4500° Kelvin.

Electronic control panel for light Parameter's adjustment.

Color rendition index of 96 or more.

LED life 50,000 hours or better.

Autoclavable handles.

Operating Voltage 220V, 50Hz.

Integrated digital camera system:

 Resolution: Full HD (1,920 x 1,080 Pixels) or better

 Video outputs: 2x HD-SDI or 1x HDMI/DVI-D

 Provision of Video transmission facility

 Medical graded LCD or LED 24'' to 26'' minimum along with mounted on third arm.

Accessories:

1. UPS imported for two hours minimum backup to be supplied locally.

Optional:

1. Fourth arm of 160000 LUX at 1 meter.

Clinical Specialty	Operation Theater and General Surgery
Generic Name:	**MOBILE OPERATION LIGHT**
Clinical Purpose	OT Light is a medical device intended to assist medical personnel during a surgical procedure by illuminating a local area or cavity of the patient.

Technical Specifications:

Mobile LED emergency shadow less operation theater light.

Hermetically dust proof LED head.

Luminance at 1m distance 160,000 lux or above.

Color temperature 4000°-4500° kelvin or better.

Light field diameter between 20 – 24 cm or better (required lux should be available within max. light field area.

Color rendering index 96 or more.

LED life 50,000 hours or more.

Temp. rise in surgical surface <2° C

220 V / 50 Hz 1 phase.

Built-in rechargeable battery backup for at least 2 hours.

Autoclavable handles.

Clinical Specialty	Operation Theater and General Surgery
Generic Name:	**BASIC ELECTROSURGICAL UNIT**
Clinical Purpose	Electrosurgical Machine is used to cut, coagulate and desiccate the biological tissues.

Technical Specifications:

Microprocessor based electrosurgical unit for normal and under water cutting usages. Automatic self-test function.

Operation in radio frequency range.

Controls for cutting, coagulation, spray and blends.

Monopolar cutting power of 280 to 300 watts with change of 05 watts or with less increments.

Mono polar coagulation power of 120 Watts or more.

Bipolar coagulation power of 100 Watts or more.

Spray coagulation mode.

Different gradations of blending of cutting and coagulation power.

Digital display of all controls and set values of cutting and coagulation power.

Audio and visual alarms. 220V, 50 Hz.

Accessories (I/O to Specify):

Monopolar handle with cord.

- Bipolar forceps with cord.
- Attachment for monopolar coagulation.
- Knife electrode.
- Surgical electrode, ball-shaped.
- Wire loop electrode.
- Needle electrode.
- Ball electrode.
- Bipolar coagulation forceps.
- Reusable patient plate.
- Double paddle foot switch, explosion proof.
- Trolley with lockable antistatic castors may be provided locally.

Clinical Specialty	Operation Theater and General Surgery
Generic Name:	**LOW POWER ELECTROSURGICAL UNIT FOR EYE/ENT/DENTAL SURGERY**
Clinical Purpose	Electrosurgical Machine is used to cut, coagulate and desiccate the biological tissues.

Technical Specifications:

Microprocessor based electrosurgical unit for normal and under water cutting usages.

Automatic self-test function.

Operation in radio frequency range.

Controls for cutting, coagulation, spray and blends.

Monopolar cutting power of 80 to 100 watts or better.

Mono polar coagulation power of 50 Watts or better.

Spray coagulation mode.

Different gradations of blending of cutting and coagulation power.

Digital display of all controls and set values of cutting and coagulation power.

Audio and visual alarms.

220V, 50 Hz.

Accessories (I/O to Specify):

Monopolar handle with cord.

Bipolar forceps with cord.

Trolley having anti-static lockable wheels. To be supplied locally.

Attachment for monopolar coagulation.

Knife electrode.

Surgical electrode, ball-shaped.

Wire loop electrode.

Needle electrode.

Ball electrode.

Bipolar coagulation forceps.

Reusable silicon patient plate.

Double paddle foot switch, explosion proof.

Clinical Specialty	Operation Theater and General Surgery
Generic Name:	**HIGH END ELECTROSURGICAL UNIT**
Clinical Purpose	Electrosurgical Machine is used to cut, coagulate and desiccate the biological tissues.

Technical Specifications:

Microprocessor based electrosurgical unit for normal and under water cutting usages. Automatic self-test function.

Operation in radio frequency range.

Controls for cutting, coagulation, spray and blends.

Monopolar cutting power of 350 watts or more with change of 05 watts or less increment.

Bipolar cutting power of 120 watts or more.

Mono polar coagulation power of 120 Watts or more.

Bipolar coagulation power of 100 Watts approx.

Spray coagulation mode.

Different gradations of blending of cutting and coagulation power.

Touch Screen Display of all controls and set values of cutting and coagulation power, error messages etc.

Audio and visual alarms. 220V, 50 Hz.

Accessories (I/O to Specify):

- Monopolar handle with cord.
- Bipolar forceps with cord.
- Trolley having anti-static lockable wheels.
- Attachment for monopolar coagulation.
- Knife electrode.
- Surgical electrode, ball-shaped.
- Wire loop electrode.
- Needle electrode.
- Ball electrode.
- Bipolar coagulation forceps.
- Reusable silicon patient plate.
- Double paddle foot switch, explosion proof.

Clinical Specialty	Operation Theater and General Surgery
Generic Name:	**ULTRASONIC DISSECTOR SYSTEM**
Clinical Purpose	Ultrasonic Dissector System is used in open procedure for soft tissue dissection and vessel occlusion.

Technical Specifications:

Ultrasonic Dissector System for cutting and coagulation.

Generator with LED feedback indicator.

Ultrasonic shears with 5mm diameter and 39cm shaft length approx.

Active blade vibrations: 36 KHz or more.

Ability to seal vessel up to 5-8mm.

Note: Disposable system will not acceptable.

Accessories (I/O to Specify):

- Laparoscopic Shear 34cm or more.
- Open shear 17cm or more.
- User manual.
- Foot switch and cable.
- Mobile cart.
- Bariatric Shear 43cm or more long (I.O to specify)
- Sterilization tray.

Clinical Specialty	Operation Theater and General Surgery
Generic Name	**DIATHERMY WITH VESSEL SEALING SYSTEM**
Clinical Purpose	Diathermy with Vessel Sealing System is used for normal and under water cutting and coagulation in various open and laparoscopic procedures.

TECHNICAL SPECIFICATIONS

- Touch screen generator with 350 Watts or more.
- Microprocessor based solid state electrosurgical unit for normal and under water cutting with permanent safe sealing of vessel on tissue bundle: 7mm. thermal spread should be minor.
- RF power for monopolar cutting not below 350 watts or more with 5-watt step increment or less.
- Monopolar coagulation 120 Watt or better.
- At least 3-4- blend/effect modes.
- Monopolar Coagulation: 120 watts or more.
- Bipolar Coagulation 100 watts or more.
- Bipolar cutting 120 watt or more.
- Spray Coagulation
- 220 VAC, 50 Hz.

Accessories (I/O to Specify):

- Complete with foot switch, reuse-able patient plate, monopolar handle with cord and surgical needles (knifes, ball electrode, loop electrode and needle (Qty: 12).
- Bipolar forceps straight.
- Bipolar forceps bayonet.
- Imported trolley with lockable wheels.
- Reusable laparoscopic instruments 5mm or 200 pieces of disposable.
- Instruments for open surgery (01 reusable or 200 pieces of disposable)

Clinical Specialty	Operation Theater and General Surgery
Generic Name	**ULTRASONIC WITH ADVANCED VESSEL SEALINGSYSTEM**
Clinical Purpose	Sealing, Cutting, Back scoring, Grasping and Dissection

TECHNICAL SPECIFICATIONS

Desktop Ultrasonic and advance bipolar generator for general surgery sealing cutting grasping and dissection.

Sealing Output:

- Thermal Spread less than 1mm
- Bipolar, no neutral electrode required

HS Output:

Ultrasonic and Bipolar hand piece.

Note: Disposable System will not acceptable.

Optional accessories:(according to requirement)

- Ultrasonic Hand Piece Grey for shears
- Ultrasonic Hand piece Blue for shear foot pedal
- Ultrasonic Connector
- Advance bipolar connector
- Generator cart/Trolley
- Ultrasonic Lap shear 35-39 cm
- Ultrasonic open shear 20-23 cm
- Ultrasonic open shear 9 to 18cm.
- Advance bi- polar open shear
- Advance bi-polar Lap shear

Clinical Specialty	Operation Theater and General Surgery
Generic Name	**SOLID STATE ELECTROSURGICAL UNIT WITH ARGONPLASMA SYSTEM**
Clinical Purpose	Energy device used for surface coagulation and debulking tumor and mostly introduced through endoscopy.

TECHNICAL SPECIFICATIONS

Microprocessor based Touch Screen Argon plasma electrosurgical unit for normal and under water cutting usages.Automatic self-test function.

Operation in radio frequency range. Controls for cutting, coagulation, spray and blends.

Monopolar cutting power of 350 Watts or more.

Bipolar cutting power of 120 Watts or more.

Monopolar coagulation power of 120 Watts or more.

Bipolar coagulation power of 100 Watts.

Spray coagulation mode.

Different gradations of blending of cutting and coagulation power.

7" Touch Screen display of all controls and set values of cutting and coagulation power.Audio and visual alarms.

220V, 50 Hz.

Accessories (I/O to Specify):

- Argon plasma beam attachment with argon cylinders.
- Complete with its handle and electrodes (sizes to be defined by the end-user)/forceps controlledby foot switch.
- Reusable Silicon patient plate
- Double paddle foot switch, explosion proof.
- Monopolar handle with cord.
- Bipolar forceps with cord.
- Trolley having anti-static lockable wheels.
- Argon Gas Cylinder with Regulator.

Clinical Specialty	Operation Theater and General Surgery
Generic Name	**BLOOD WARMER**
Clinical Purpose	A blood warmer is used in healthcare facilities for warming blood product.
TECHNICAL SPECIFICATIONS	
Microprocessor controlled unit should have facility of reliable transfusion and infusion for intra and post-operative hypothermia. Dry warming system. Online warming with tubing. Pre-selected temperature settings over the range 37^{O}C or 39^{O}C. Indications and display for different temperatures. Blood warming device with safety cutout at 41-43^{O}C. Visual and audible alarm for low and high temperature	

Clinical Specialty	Operation Theater and General Surgery
Generic Name	**Dual Channel Blood**
Clinical Purpose	A blood warmer is used in healthcare facilities for warming blood product.

TECHNICAL SPECIFICATIONS

- **<u>TECHNICAL SPECIFICATIONS</u>**
- Microprocessor controlled unit should have facility of reliable transfusion for intra and postoperative hypothermia.
- Dual Channel for Blood.
- LCD Display.
- Dry warming system.
- Online warming with tubing.
- Compatible with standard I.V. & BT Set
- Adjustable temperature settings over the range +33°C to 41°C.
- Safety through three independent temperature sensors
- Length of Warming Sleeves is 1500mm
- Display preset and actual temperature of the warming device
- Visual and Acoustic Alarms.
- Overtemperature alarm (1°C above set point)
- 220V AC 50 Hz.

Clinical Specialty	Operation Theater and General Surgery
Generic Name	**PATIENT WARMING SYSTEM**
Clinical Purpose	Warmer Blanket is used for maintaining the optimum temperature ofthe patient for optimum recovery.

TECHNICAL SPECIFICATIONS

Microprocessor controlled patient warming system for prevention of hypothermia.Temperature control range of 32 - 39^{o}C.

Individual control of blankets.

Set and actual temperature display.Temperature Measurement between warming system and patient

Low noise fan.

Fully automatic system for wide range of application.Complete system with filters.

Automatic stop in case of overheating.

Coupling for different type of blankets.

Accessories:

- Blankets should be washable, resistant to disinfectant and fluid resistant, replaceable type. If the firm quote the disposable blankets, then it will bound to quote 100 disposable blankets for adults and pediatrics of each type.
- Theblanket sizes are approximate.
- Arm shoulder blanket 170x30 cm.
- Torso blanket 45x90 cm.
- Leg blanket 45x90 cm.
- Recovery blanket 120x200 cm.

Clinical Specialty	Operation Theater and General Surgery
Generic Name	**UV LIGHT**
Clinical Purpose	This is germicidal lamp for environment, surface and air Sterilization
TECHNICAL SPECIFICATIONS	
• Mobile Short-wave UV and UVC combo unit for Surface Disinfection. • Ozone Lamp to generate short wave radiation which will convert atmospheric Oxygen into Ozone • Two Phase Operation System. • First Phase the Ozone Generation Lamps should convert Atmospheric Oxygen into Gaseous Ozone. • Second Phase UV Lamp switched on automatically and disinfect directly and indirectly surface and room Air. The Residual ozone in the room will converted back into Oxygen. • Efficiency 99% at-least. • Chemical free. • Motion Detector as safety switch which enable the device to be switched off in case of any Human movement detected. • At-least 8 lamps to cover 360° space. Minimum power 260watt or more. • Stainless steel ring to protect lamps. • 220 V/50Hz	

Clinical Specialty	**OT General Surgery**
Generic Name	**AUTOMATIC WATER DISPENSER FOR SCRUB AREA**
Clinical Purpose	Clean area for scrubbing of surgeons and nurses.

TECHNICAL SPECIFICATIONS

Three stations knee operated scrub station.Made of stainless steel.

Anti-splash basin.

1/2-siphon.

Removable or fixed front panel.

IR Sensor and 3-knee controls.

3-water tapes with a mixing valve.Water pipe

hoses for cold and hot water.

Stainless steel brackets or fittings to fix the sink to the wall.

Hygienic tap shaving built-in-tap thermostatic mixing valve to supply 42^{o}C hot water.

The tap shall also have built-in strainers and the provision for easy and quick thermal disinfection toremove the scaling.

Accessories:

- Soap dispenser unit.
- Hand washing brush dispenser made of SS

Clinical Specialty	Operation Theater and General Surgery
Generic Name:	**2D-Full HD Operating Laparoscope (Adult)**
Clinical Purpose	Used for the surgical procedures in which fine instruments are inserted through abdominal wall to view the organs in the abdomen or permit small scale surgery

Technical Specifications:

Imaging system should have backward and forward compatibility and modularity for futures upgradeand with latest image enhancement modules for better image quality and identifications of the land marks and pathology for better outcomes of the surgery

The laparoscope of these specifications shall be provided/compatible with full UHDminimum of 1920 x 1080 pixels with the method of Progressive Scanning.

Telescope

i) Diameter 10 mm, 0^{o}working length 290-340 mm.

ii) 10 mm straight, 30^{o} view working length 290-340 mm.

iii) 5 mm straight forward “0” degree.

iv) 5 mm forward oblique “30” degree

Camera Full 3 CCD or 3 CMOS (1920x1080 Pixels)

v) Camera control unit and video camera Head, Pal system.

vi) Integrated (image processing model)

vii) Power supply accordingly

Special Feature Required:

viii) Automatic or manual while balance

ix) Powerful video signal processing

x) Image enhancement modes.

xi) Picture in picture mode control via camera head button or monitor

xii) Control of peripheral i.e., light source, recording system parameter via camera head button or console.

xiii) Still image capturing in full HD quality (JPEG) format via camera head buttons

xiv) Video capturing in full HD quality (MPEG 4 format) via camera head buttons

xv) Should have compatibility with video scope of same brand.

xvi) Max. resolution: 1920 x 1080 -pixel, progressive scan

xvii) Video Output: HDMI OR DVI OR SDI

xviii) Composite signal to BNC Socket.

xix) S-Video Signal to 4-pin mini–Din Socket (2X)

xx) RGB Signal to D-Sub Socket.

xxi) DV Signal to DV Socket (only with DV Module)

Monitor:

Medical graded full HD LCD or LED 30 Inch or better with Resolution 1920x1080 from the same manufacturer.

ARM or STAND FOR THE LED or LCD Monitor.

Imported trolley should be from same manufacturer.

Light Source equal to 300 watts.

LED with all standard accessories.

Light guide cable, diameter 4mm or more length minimum 200 to 300 cm.

Electronic CO2 insufflator.

40-50 Liter/min complete in all respect with all standard accessories.

SMOKE EVACUATOR SYSTEM OR ANTI FOGGING SYSTEM.

Clip applicators.

Trocar with trocar sleeve 10mm Approx. (2 No's)

Trocar with trocar sleeve 05mm Approx. (2 No's)

High flow verses needle. (2 No's)

Integrated or separate medical graded video recorder with storage capacity of 500GB or more.

Accessories:

i) Online 2KVA UPS with 30 min backup to be provided locally.

ii) Co2 Cylinder 240CFT with complete accessories (to be supplied locally) certified by respective agency.

iii) Imported storage boxes for instruments and optics.

iv) Imported disinfection Boxes.

v) Standard Cleaning Set as manufacturer recommendations for cleaning of tubular shafts and other instruments.

Optional.

10 mm straight, 45^{o} or more view working length 290-340 mm

Note: Minor deviation in shape and sizes will not be consider reason of rejection.

Clinical Specialty	**OT General Surgery**
Generic Name	**THREE DIMENSIONAL (3D) OPERATING LAPAROSCOPE**
Clinical Purpose	3D Laparoscope is used for the surgical procedure in which fine instruments are inserted through abdominal wall to view the organs in 3D vision for depth perception, in the abdomen or permit small scale surgery

TECHNICAL SPECIFICATIONS

Imaging system should have latest image enhancement modes for better image quality and identifications of the land marks and pathology for better outcomes of the surgery. Spatial, three-dimensional vision in combination with a future-oriented sterile supply concept for all laparoscopic indications in the fields of General Surgery & Gynecology Surgery.

The laparoscope and all allied components of these specifications shall be provided/compatible with full HD minimum of 1920x1080 pixels with the method of Progressive Scanning. Three dimensional (3D) Full HD Camera System:

- 3D Camera platform that works with 3D and 2D camera heads.
- CCU detects the connected camera head and automatically provides the respective camera settings.
- Automatic or manual light intensity control in combination with LED light source.
- White balance function button on CCU front or camera head.
- Scan mode: Progressive.
- 3D camera sensor resolution: native Full HD (1920 x 1080 pixels).
- Image sensors: 3CCD or 2 CMOS.
- Viewing angle: 0- and 30-degrees Endoscope with outer shaft diameter of 10 mm Endoscope working length: 300 mm or more (as per I/O to Specific).
- Automatic or Manual brightness adjustment.
- 05x Surgeon 3D glasses can be easily worn on spectacles.
- 15x 3D glasses for technicians and staff.
- Video outputs: 2 x 3D via 3G HD-SDI, or 2x 3D via DVI-D, or 2x 2D via DVI-D
- 3D Camera head box for safe storing and transportation.

Three dimensional (3D) FULL HD Monitor 30” inches or above from same manufacturer.

- Maximum monitor resolution: 1920 x 1080 pixel (Full HD).
- Video inputs: 2x 3G-SDI, 2x DVI-D, 1x RGB, 1x S-Video • Video outputs: 2x 3G-SDI, 1x DVI-D, 1x S-Video, 1x Video or as per manufacturer standard

Electronic CO2 Insufflator: • 40-50 liter/min, complete in all standard accessories.

Light Source: • LED type working hours 25K or more or long-life.

Trolley: • Imported - from same principal.

Recording System: • integrated or Separate recording system with storage capacity 500 GB or more supplied from same principal to capture still images/video recording in 2D with full HD or resolution (1920 x 1080 pixel).

• Recording format of 2D or 3D video data: 16:9 USA / EU / JAPAN

Electronic CO2 insufflator.

40-50 Liter/min complete in all respect with all standard accessories.

SMOKE EVACUATOR SYSTEM OR ANTI FOGGING SYSTEM.

Accessories:

i) Online 2KVA UPS with 30 min backup to be provided locally.
ii) Co2 Cylinder 240CFT with complete accessories (to be supplied locally) certified by respective agency.
iii) Imported storage boxes for instruments and optics.
iv) Imported disinfection Boxes.
v) Standard Cleaning Set as manufacturer recommendations for cleaning of tubular shafts and other instruments.

LIST OF INSTRUMENTS REQUIRED FOR GENERAL SURGERY.

Note: The Minor deviation in sizes and type of the instruments would be acceptable.

The Size of Instruments Approximate. The mentioned shaped and style of instruments is reference and may be quoted their equivalent.

Hasson Cone:

vi) Trocar size 10/11 mm with cannula & multifunction valve length 10.5cm pyramidal tip & conical tip one.
vii) Maryland dissecting forceps slightly curved with Cannula pin for unipolar coag Dia 5mm, length 30-36 cm, insulated, relatable.
viii) Dissecting forceps insulated rotatable needle nose.
ix) Reddick-Olsen dissecting and grasping Forceps, heavy.
x) Dissecting and Grasping forceps, alligator jaws with connector pin for unipolar coagulation, size 5mm. (rotatable, straight)
xi) Dissecting and Grasping Forceps, (Kelly's)with connector pin for unipolar coagulation, size 5mm. length 30-36 cm length, double action jaw.

xii) Dissecting and grasping forceps, (Kelly's)with connector pin for unipolar coagulation, size 5mm36 cm length, double action jaw grasping forceps with teeth with connector pin for unipolar coagulation, size 5mm double action jaw with ratchet.

xiii) Multifunction grasping forceps, 1x2 teeth with connector pin for unipolar coagulation, size 5mm

xiv) Bowel grasping forceps, two rows of traumatic teeth without connector pin for unipolar coagulation, size 5/10mm.

xv) Bowel Grasping Forceps With connector pin for unipolar coagulation, size 5/10mm.

xvi) Babcock Grasping Forceps rotating, dismantling with connector pin for unipolar coagulation, size 5/10mm. (with ratchet).

xvii) Babcock Grasping Forceps rounded without connector pin for unipolar coagulation, size 5/10mm.

xviii) Claw forceps, single/double/action jaw, with teeth, size 5/10mm, length 33-36, 01short, rotating consisting of Mattel or sterilizable handle with ratchet, outer tube, insulated, forceps insert.

xix) Clip applicator (medium large) & medium, rotating, ratchet with clips.

xx) Tenaculum forceps, rotating, size 5/10 mm, length 33-36 cm, and Mattel or sterilizable handle with ratchet, outer tube, insulated, and forceps insert.

xxi) Metzenbaum scissors, curved rotating, with connector pin for unipolar coagulation, size 5 mm, length 33-36 cm insulated handle, outer tube, insulated.

xxii)Curved/angled scissors, rotating, size 5mm, length 33-36cm: insulated handle, outer tube, insulated.

xxiii) Micro scissor curved 5mm, insulated with diathermy Lead.

xxiv) Hook scissor single action jaws, size 5 mm, length 33-36 cm: insulated handle, outer tube, insulated, insert.

xxv)Scissor straight 5mm insulated with diathermy.

xxvi) L Shaped dissecting electrode /diathermy size 5mm, insulated, length 33-36 cm (L-hook dissector).

xxvii) Coagulating and dissecting electrode, spatula-shaped, blunt with connector pin for unipolar coagulation, size 5 mm, working length 33-36cm.

xxviii) (Injection) Aspiration needle 5mm.

xxix) Biopsy forceps insulated (5mm).

xxx)Bipolar diathermy electrode.

xxxi) Uterine cannula, with 2 cones, large and small spring-loaded fixation for forceps with luer-

lock adaptor for cleaning.

xxxii) Uterine tenaculum forceps, length 22cm.

xxxiii) Suction and coagulation cannula, 3mm, with connector pin for unipolar coagulation, 30cm.

xxxiv) Dissecting electrode l and j shaped.

xxxv) Needle holder 5 mm

xxxvi) Needle grasper 5 mm

xxxvii) Thread manipulator 5 mm

xxxviii) Retractor 10 mm (3 blade)

xxxix) Knot pusher.

xl) Diathermy Leads Autoclavable.

xli) Bipolar Forceps and Leads.

xlii) Clip applicators.

xliii) Trocar with trocar sleeve 05mm Approx.

xliv) High flow verses needle.

Clinical Specialty	**OT General Surgery**
Generic Name	**OPERATING LAPAROSCOPE ADULT 4K**
Clinical Purpose	Laparoscope is used for the surgical procedure in which fine instruments are inserted through abdominal wall to view the organs in the abdomen or permit small scale surgery.

TECHNICAL SPECIFICATIONS

Imaging system should have backward and forward compatibility and modularity for futures upgrade and with latest image enhancement modules for better image quality and identifications of the land marks and pathology for better outcomes of the surgery

The laparoscope of these specifications shall be provided or compatible with full UHDminimum of 3840 x 2160 pixels with the method of Progressive Scanning.

Telescope

i) Diameter 10 mm, 0^{o}working length 290-320 mm.
ii) 10 mm straight, 30^{o} view working length 290-320 mm.
iii) 5 mm straight forward “0” degree.
iv) 5 mm forward oblique “30” degree

Camera Full 3CCD /3 CMOS + Monitor

v) Camera control unit and video camera Head, Pal system.
vi) Integrated (image processing model)
vii) Power supply accordingly

Special Feature Required:

viii) Automatic or manual white balance
ix) Powerful video signal processing
x) Image enhancement modes.
xi) Picture in picture mode control via camera head button or monitor.
xii) Control of peripheral i.e., light source, recording system parameter via camera head button

xiii) Still image capturing in full HD quality (JPEG) format via camera head buttons

xiv) Video capturing in full HD quality (MPEG 4 format) via camera head buttons

xv) Should have compatibility with future upgrade like 3 D or better or equivalent.

xvi) Max. resolution: 3840 x 2160-pixel, progressive scan

xvii) Video Output: HDMI OR DVI OR SDI or as per manufacturer standard

Monitor 4K:

4K LCD /LED 30 Inch or better with Resolution 3840x2160 from the same manufacturer. ARM or stand for monitor.

xviii) Imported trolley should be from same manufacturer.

xix) XENON (300 watt)/ LED Light Source with all standard accessories. (If the firm will quote the xenon light source it will be compulsory to quote and supply 05 lamp)

xx) Light guide cable, diameter 4mm or more length minimum 200 to 300 cm.

Electronic CO2 insufflator.

40-50 Liter/min complete in all respect with all standard accessories.

SMOKE EVACUATOR SYSTEM OR ANTI FOGGING SYSTEM.

Integrated or separate medical graded video recorder with storage capacity of 500GB or more from same manufacturer.

Accessories:

i) Online 2KVA UPS with 30 min backup to be provided locally.

ii) Co2 Cylinder 240CFT with complete accessories (to be supplied locally) certified by respective agency.

iii) Imported storage boxes for instruments and optics.

iv) Imported disinfection Boxes.

v) Standard Cleaning Set as manufacturer recommendations for cleaning of tubular shafts and other instruments.

LIST OF INSTRUMENTS REQUIRED FOR GENERAL SURGERY.

Note: The Minor deviation in sizes and type of the instruments would be acceptable.

The Size of Instruments Approximate. The mentioned shaped and style of instruments is reference and may be quoted their equivalent.

Hasson Cone:

i) Trocar size 10/11 mm (With Color Code) with cannula & multifunction valve length 10.5cm

pyramidal tip & conical tip one.

ii) Maryland dissecting forceps slightly curved with Cannula pin for unipolar coagdia 5mm, length 30- 36 cm, insulated, rotatable.

iii) Dissecting forceps insulated rotatable needle nose.

iv) Reddick-Olsen dissecting and grasping Forceps, heavy.

v) Dissecting and Grasping forceps, alligator jaws with connector pin for unipolar coagulation, size 5mm. (rotatable, straight)

vi) Dissecting and Grasping Forceps, (Kelly's)with connector pin for unipolar coagulation, size 5mm. length 30-36 cm length, double action jaw.

vii) Dissecting and grasping forceps, (Kelly's)with connector pin for unipolar coagulation, size 5mm36 cm length, double action jaw grasping forceps with teeth with connector pin for unipolar coagulation, size 5mm double action jaw with ratchet.

viii) Multifunction grasping forceps, 1x2 teeth with connector pin for unipolar coagulation, size 5mm

ix) Bowel grasping forceps, two rows of traumatic teeth without connector pin for unipolar coagulation, size 5/10mm.

x) Bowel Grasping Forceps With connector pin for unipolar coagulation, size 5/10mm.

xi) Babcock Grasping Forceps rotating, dismantling with connector pin for unipolar coagulation, size 5/10mm. (with ratchet).

xii) Babcock Grasping Forceps rounded without connector pin for unipolar coagulation, size 5/10mm.

xiii) Claw forceps, single/double/action jaw, with teeth, size 5/10mm, length 30-36, 01short, rotating consisting of metal handle with ratchet, outer tube, insulated, forceps insert.

xiv) Clip applicator (medium large) & medium, rotating, ratchet with clips.

xv) Tenaculum forceps, rotating, size 5/10 mm, length 30-36 cm, and metal handle with ratchet, outer tube, insulated, and forceps insert.

xvi) Metzenbaum scissors, curved rotating, with connector pin for unipolar coagulation, size 5 mm, length 30-36 cm insulated handle, outer tube, insulated.

xvii) Curved/angled scissors, rotating, size 5mm, length 30-36cm: insulated handle, outer tube, insulated.

xviii) Micro scissor curved 5mm, insulated with diathermy.

xix) Hook scissor single action jaws, size 5 mm, length 30-36 cm: insulated handle, outer tube, insulated, insert.

xx) Scissor straight 5mm insulated with diathermy.

xxi) L Shaped dissecting electrode /diathermy size 5mm, insulated, length 30-36 cm (L-hook

dissector).

xxii)Coagulating and dissecting electrode, spatula-shaped, blunt with connector pin for unipolar coagulation, size 5 mm, working length 30-36cm.

xxiii) (Injection) Aspiration needle 5mm.

xxiv) Biopsy forceps insulated (5mm).

xxv)Bipolar or monopolar diathermy electrode.

xxvi) Uterine cannula, with 2 cones, large and small spring-loaded fixation for forceps with luer-lock adaptor for cleaning.

xxvii) Uterine tenaculum forceps, length 30-36cm.

xxviii) Suction and coagulation cannula, 3 to 5mm, with connector pin for unipolar coagulation, 30cm.

xxix) Dissecting electrode l and j shaped.

xxx)Needle holder 5 mm

xxxi) Needle grasper 5 mm

xxxii) Thread manipulator 5 mm

xxxiii) Retractor 5mm or 10 mm (3-5 blade)

xxxiv) Knot pusher.

xxxv) Clip applicators.

xxxvi) Trocar with trocar sleeve 10mm Approx.

xxxvii) Trocar with trocar sleeve 05mm Approx.

xxxviii) High flow verses needle.

xxxix) Diathermy Leads Autoclavable.

xl) Bipolar Forceps and Leads.

Note: Minor deviation and sizes and shapes will not be considered a reason of rejections.

Clinical Specialty	**OT General Surgery**
Generic Name	**3D/4K LAPAROSCOPE SET WITH, INFRARED IMAGING /ICG / AUTOFLUORESCENCE / (ADVANCED TOWER).**
Clinical Purpose	For Advance surgeries such as Liver resection, Tumor surgery & Colon surgeries to Avoid leakages and to prevent recurrent surgeries.

TECHNICAL SPECIFICATIONS

Imaging system should have backward and forward compatibility and modularity for futures upgrade and with latest image enhancement modules for better image quality and identifications of the land marks and pathology for better outcomes of the surgery

The laparoscope of these specifications shall be provided/compatible with full UHDminimum of 3840 x 2160 pixels with the method of Progressive Scanning.

Telescope Should be compatible with IR/AF/ICG Function.

i) Diameter 10 mm, 0^{o}working length 290-320 mm.
ii) 10 mm straight, 30^{o} view working length 290-320 mm.
iii) 5 mm straight forward “0” degree.
iv) 5 mm forward oblique “30” degree.

Camera Full 3CCD /3 CMOS + Monitor Should be compatible with IR/AF/ICG Function.

v) Camera control unit and video camera Head, Pal system.
vi) Integrated (image processing model)
vii) Power supply accordingly

Special Feature Required:

viii) Automatic or manual white balance
ix) Powerful video signal processing
x) Image enhancement modes.
xi) Picture in picture mode control via camera head button or monitor.
xii) Control of peripheral i.e., light source, recording system parameter via camera head button Should be

compatible with IR/AF/ICG Function.

xiii) Still image capturing in full HD quality (JPEG) format via camera head buttons

xiv) Video capturing in full HD quality (MPEG 4 format) via camera head buttons

xv) Should have compatibility with future upgrade like 3 D or better or equivalent.

xvi) Max. resolution: 3840 x 2160-pixel, progressive scan

xvii) Video Output: HDMI OR DVI OR SDI or as per manufacturer standard

Monitor 4K:

4K LCD /LED 30 Inch or better with Resolution 3840x2160 from the same manufacturer. ARM or stand for monitor.

xviii) Imported trolley should be from same manufacturer.

xix) XENON (300 watt)/ LED Light Source with all standard accessories. (If the firm will quote the xenon light source it will be compulsory to quote and supply 05 lamp)

xx) Light guide cable, diameter 4mm or more length minimum 200 to 300 cm.

Electronic CO2 insufflator.

40-50 Liter/min complete in all respect with all standard accessories.

SMOKE EVACUATOR SYSTEM OR ANTI FOGGING SYSTEM.

Integrated or separate medical graded video recorder with storage capacity of 500GB or more supplied from same principle.

Accessories:

vi) Online 2KVA UPS with 30 min backup to be provided locally.

vii) Co2 Cylinder 240CFT with complete accessories (to be supplied locally) certified by respective agency.

viii) Imported storage boxes for instruments and optics.

ix) Imported disinfection Boxes.

x) Standard Cleaning Set as manufacturer recommendations for cleaning of tubular shafts and other instruments.

LIST OF INSTRUMENTS REQUIRED FOR GENERAL SURGERY.

Note: The Minor deviation in sizes and type of the instruments would be acceptable.

The Size of Instruments Approximate. The mentioned shaped and style of instruments is reference and may be quoted their equivalent.

Hasson Cone:

i) Trocar size 10/11 mm (With Color Code) with cannula & multifunction valve length 10.5cm pyramidal

tip & conical tip one.

ii) Maryland dissecting forceps slightly curved with Cannula pin for unipolar coagdia 5mm, length 30- 36 cm, insulated, rotatable.

iii) Dissecting forceps insulated rotatable needle nose.

iv) Reddick-Olsen dissecting and grasping Forceps, heavy.

v) Dissecting and Grasping forceps, alligator jaws with connector pin for unipolar coagulation, size 5mm. (rotatable, straight)

vi) Dissecting and Grasping Forceps, (Kelly's)with connector pin for unipolar coagulation, size 5mm. length 30-36 cm length, double action jaw.

vii) Dissecting and grasping forceps, (Kelly's)with connector pin for unipolar coagulation, size 5mm36 cm length, double action jaw grasping forceps with teeth with connector pin for unipolar coagulation, size 5mm double action jaw with ratchet.

viii) Multifunction grasping forceps, 1x2 teeth with connector pin for unipolar coagulation, size 5mm

ix) Bowel grasping forceps, two rows of traumatic teeth without connector pin for unipolar coagulation, size 5/10mm.

x) Bowel Grasping Forceps With connector pin for unipolar coagulation, size 5/10mm.

xi) Babcock Grasping Forceps rotating, dismantling with connector pin for unipolar coagulation, size 5/10mm. (with ratchet).

xii) Babcock Grasping Forceps rounded without connector pin for unipolar coagulation, size 5/10mm.

xiii) Claw forceps, single/double/action jaw, with teeth, size 5/10mm, length 30-36, 01short, rotating consisting of metal handle with ratchet, outer tube, insulated, forceps insert.

xiv) Clip applicator (medium large) & medium, rotating, ratchet with clips.

xv) Tenaculum forceps, rotating, size 5/10 mm, length 30-36 cm, and metal handle with ratchet, outer tube, insulated, and forceps insert.

xvi) Metzenbaum scissors, curved rotating, with connector pin for unipolar coagulation, size 5 mm, length 30-36 cm insulated handle, outer tube, insulated.

xvii) Curved/angled scissors, rotating, size 5mm, length 30-36cm: insulated handle, outer tube, insulated.

xviii) Micro scissor curved 5mm, insulated with diathermy.

xix) Hook scissor single action jaws, size 5 mm, length 30-36 cm: insulated handle, outer tube, insulated, insert.

xx) Scissor straight 5mm insulated with diathermy.

xxi) L Shaped dissecting electrode /diathermy size 5mm, insulated, length 30-36 cm (L-hook dissector).

xxii)Coagulating and dissecting electrode, spatula-shaped, blunt with connector pin for unipolar coagulation, size 5 mm, working length 30-36cm.

xxiii) (Injection) Aspiration needle 5mm.

xxiv) Biopsy forceps insulated (5mm).

xxv)Bipolar or monopolar diathermy electrode.

xxvi) Uterine cannula, with 2 cones, large and small spring-loaded fixation for forceps with luer-lock adaptor for cleaning.

xxvii) Uterine tenaculum forceps, length 30-36cm.

xxviii) Suction and coagulation cannula, 3 to 5mm, with connector pin for unipolar coagulation, 30cm.

xxix) Dissecting electrode l and j shaped.

xxx)Needle holder 5 mm

xxxi) Needle grasper 5 mm

xxxii) Thread manipulator 5 mm

xxxiii) Retractor 5mm or 10 mm (3-5 blade)

xxxiv) Knot pusher.

xxxv) Clip applicators.

xxxvi) Trocar with trocar sleeve 10mm Approx.

xxxvii) Trocar with trocar sleeve 05mm Approx.

xxxviii) High flow verses needle.

xxxix) Diathermy Leads Autoclavable.

xl) Bipolar Forceps and Leads.

Note: Minor deviation and sizes and shapes will not be considered a reason of rejections.

Optional/ Not mandatory to quote: Procuring agency may add as per requirement.

Exoscope (Same Manufacturer) 0 ° with Integrated Illuminator, 'straight forward scope 0 °, working distance 25 - 75 cm, length 11 cm, 'autoclavable, with fiber optic light transmission incorporated and condenser lenses NIR/ICG compatible for tumor resection assistance in open surgery Tray for cleaning, sterilization and storage of two rigid endoscopes and one light cable. Including holder for adaptors, silicone telescope holders and lid. For rigid endoscopes with up to 10mm diameter and 20cm working length.

Holding System, with quick release coupling (same Manufacturer)

Consisting of:

Rotation Socket, to clamp to the OR table, for standard rails, with lateral clamp for height and angle adjustment of the stand.

Electrical base unit, for use with holding arm.

holding arm, with electrical locking mechanism with quick release coupling

Clamping Jaw, metal, with axial uptake, clamping range 4.8 up to 12.5 mm with quick release coupling for use with instrument and telescope sheaths. The system must be capable of indicating its status as being ready to use or battery voltage too low etc.

Telescope 0°, NIR/ICG, diameter 10 mm, length 30-33 cm, autoclavable, for use with indocyanine green (ICG).

Telescope 30°, NIR/ICG, diameter 10 mm, length 30-33 cm, autoclavable, for use with indocyanine green (ICG).

Telescope 45°, NIR/ICG, diameter 10 mm, length 30-33 cm, autoclavable, for use with indocyanine green (ICG).

50-60" or better 4K Monitor (same manufacturer)

Clinical Specialty	**OT General Surgery**
Generic Name	**ENDOSCOPY VIDEO ASSISTED ANAL FISTULA**
Clinical Purpose	Endoscopy video assisted anal fistula is used for the surgical treatment of complex anal fistula and their recurrences.

TECHNICAL SPECIFICATIONS

8–12-degree rigid telescope or equivalent.

Angled eye piece outer diameter 4-5 mm working 14-20cm, working channel 2-3mm.

Consisting of:

Sterilization tray.

Coagulating electrode, 5-7 Fr., unipolar.

Biopsy forceps 5-7 Fr.

Hook scissors semi flexible 5-7 Fr.

Grasping forceps, 5-7 Fr.

Cleaning brushes compatible for cleaning of Fistula track, different sizes

Anal Speculum

Unipolar cord

Clinical Specialty	**OT General Surgery**
Generic Name	**Choledochoscope**
Clinical Purpose	Used for retrieving the stones from common bile duct.

TECHNICAL SPECIFICATIONS

Angle of View: 90 -120

Direction of View: 0

Inner Diameter: 1.2mm or more

Outer Diameter:2.8mm or better

Deflection of Tip: 270 /270 or better

Working Length: 60cm

Compatible Choledoscope adaptor with existing laparoscopic camera

Accessories:

- Case for Choledochoscopse.
- Pressure compensation cap for ventilation during sterilizations.
- Leakage tester with bulb and monometer.
- Cleaning brush.
- Applicator and guide tube for Choledochoscope for use with trocar size 6mm.
- grasping forceps
- Micro knife pointed opening the hepatic duct and the bile duct size 5mm length 31cm.
- Biopsy forceps, 1mm double action jaws length 100cm flexible.
- Grasping forceps, 1mm double action jaws length 100cm flexible.
- Stone basket sterile, single use length 120cm package of 10.

Clinical Specialty	**OT General Surgery**
Generic Name	**Thromboelastographic machine (TEG)**
Clinical Purpose	Vital in the management of trauma and complex surgical operations in which there is coagulopathy and need component replacement • Indications for Blood Components Usage • Evaluate Response to Platelet GP IIb IIIa inhibitors • Identify Hypercoagulable patients • Hyper fibrinolysis, DIC, Sepsis • Differentiate between Mechanical & Hemostatic Bleeders • High Dose and Low Molecular Weight Monitoring • High Sensitivity to Residual • Different tests to help your Clinical Decisions • Faster Results: Typical Results in 15 Minutes • Simplified Usage and Microprocessor Controlled • Platelet Function Analyzer (PFA) • Portable for use in Cardiac OR, Cath Lab, ICU, Critical Care • Best Hemostasis Management in Cardiac Surgery, Liver Transplant, Critical Care

TECHNICAL SPECIFICATIONS

- Two (2) independent measuring channels per analyzer, up to eight (8) channels per computer.
- The system should be with complete accessories and cable including all kind of software's.
- Cup drive — Line-synchronized, with synchronous motor
- Temperature control — Individual temperature control for each channel
- Measuring technique — Shear elasticity of a coagulating sample, determined by motion of the pin.
- Transducer — Electrical-mechanical transducer of movement of torsion wire connected to the suspended pin

- Sample volume — 360 µL or better
- Power — External power supply @ 60 Hz or 220V model @ 50 Hz
- Initial warm-up time — Less than five (5) or better minutes to warm sample
- Operating position — Setting verified with spirit level

Clinical Specialty	**OT General Surgery**	
Generic Name	**BINOCULAR MAGNIFYING LOUPES**	
Clinical Purpose	Use in fine surgery especially surgery on nerves, tendons and smallvessels.	
TECHNICAL SPECIFICATIONS		
TYPE A Binocular alien loupes with fatigueless view. Magnification: 2.5x – 3.0x Working distance: 550-300 mm.Field of view: 115-70 mm. Titanium or sport frame designed specifically to use with loupes in different colors.		End User to Specify the type required
TYPE B Binocular prismatic loupes with fatigueless view. Magnification: 4.0x – 4.5x Working distance: 550-400 mm. Field of view: 95-65 mm. Titanium or sport frame or head band system designed. Specifically, to use with loupes in different colors.		
TYPE C Binocular prismatic loupes with fatigueless view. Magnification: 5.5x – 6.0x Working distance: 550-350 mm.Field of view: 60-40 mm. Titanium or sport frame or head band designed Specifically to use with loupes in different colors.		

Accessories:

- Storage case
- Magnification loupes and frame (in case of spectacle frame)
- Flip paddle
- Protective lens cap
- Protective shield
- Screw driver
- Cleaning cloth
- Head strap
- User Manual

Clinical Specialty	**OT General Surgery**
Generic Name	**MODULAR OPERATION THEATRE**
Clinical Purpose	Purpose built operation theatre with clean air to minimize the chances of nosocomial infections and hence reducing morbidity and hospital stay of patients.

TECHNICAL SPECIFICATIONS

WALL PANELING SYSTEM

Material – Galvanized or Stainless steel AISI304 or tempered glass with gauge and thickness of metal sheet of min. 0.8 mm ormore. Glass thickness 6mm to 10 mm.

Glass panel reinforced by minimum 0.8mm galvanized sheet or aluminum and supported by Gimsa board 12 mm or better

Plaster board on back of panel 12 mm or more.

Finish – Should be Powder Coated in any Color with antimicrobial protection.

Joints–The wall panels should be fixed on the sub-structure leaving intermediate space between the panelsand will be filled with silicon seal or gasket. Resistant to UV, detergents, bactericidal products.

Corners–Wall to wall and wall to ceiling connections should be rounded or coved made of metal sheetpowder coated finishing like the wall panels and smoothly integrated with the wall panels.

Services/utilities Outlet Panel– should be provided for the on-wall utility and service outlets at least on two walls with minimum four sockets of each. In addition to pendant. No of gas outlet I.O to Specify

Sub-Structure Profiles-Floor rails should be made of galvanized steel sheet of appropriate thickness with base height. Fastened with screws and dowels over leveled screed. The sectional supports should besuitable to support the wall panels.

AIR TIGHT CLEAN ROOM SUSPENDED CEILING SYSTEM

General Description– The clean room suspended ceiling system should be made of specified material having specialized durable powder coating with integrated antimicrobial protection on the face side in specified color.

- **Material–**Ceiling panels should be made of galvanized steel sheet

0.60 mm-0.80mm thick, with air tight mechanism.

- **Finish–** The ceiling panels should be powder coated in color having bactericidal properties.
- **Dimension –** 600 x 600mm or 1200 x 600 mm Approx.

PERIPHERAL LIGHTS FOR OPERATING ROOM

- Clean room Luminaries of recessed type for linear fluorescent lamps with 1000 lux or as per ISO Standard, should be designed forclean room suspended ceilings.
- Dimension: 600 x 1200 mm or 600 x600 mm Approx.
- Lamp: LED (Qty Should be specified in BOQ)

X-RAY VIEWER FOR OPERATING ROOM

Recessed/Built-in type, LED X-Ray viewer integrate able with the modular wall system

- No. of Films: 2 or 3
- Effective Life of LED Lights: 50,000 hours
- Flickering less

CLEAN ROOM FLOORING

Should be static dissipative homogenous vinyl roll or sheet size of 2.0mm thickness sliced from highly compressed solid block of homogenous material.

- The flooring should be electrically conductivity (ESD).
- Factory molded corners and coved corner.
- Copper taping for grounding.

AIR TIGHT AUTOMATIC SLIDING DOOR FOR OPERATING ROOMS WITH ELECTRONIC PRIVCY GLASS

- Single wing of thickness 0.8mm or more Stainless Steel AISI304 or AISI301 brushed finish orpowder coated outer skin fully
- Door acoustically and thermally isolated with highly pressured polyurethane foam
- Stainless Steel long handles from internal and external side of the door wing.
- Inspection Window–300 x 1500mm or 400 x 600 mm double glazed (safety glass) with electronicprivacy having control button provided near the door or surgeon control Panel accessible from inside of the OT.
- Safety sensor– 2set of photo cells in door frame along with infrared sensor at door

drive level oninner and outer side of the door.

- Door operation with touchless sensor.

MEDICAL CABINET FOR OPERATING ROOM

The construction of the cabinets 'body should be self-supporting, welded–without the inside frame sandrivets, entirely made of stainless steel/tempered glass

- The cabinet body should be built-in to the supporting profile integrated with modular wallsystem.
- The cabinet body and doors should be flushed with wall panel surface. Cabinets should be sealedwith a hermetic removable silicone seal.
- The doors should be made of double steel plates with glazing. Safe Glass, set in double steel sheetwindow frame
- The shelves with height adjustments, should be made of stainless steel 1mm thick, supportedfrom the bottom by trapeze profile
- **Shelves**– 4-5 adjustable shelves
- **Dimension:** As Per Required size

CEILING MOUNTED ANESTHESIA PENDANT

Ceiling mounted Anesthesia Pendant system should be powder coated, hygienically smooth surface,impact and disinfectant resistant.

Shelves – 3 or 4 pcs

Drawer – 1 or 2 Pcs

No. of Arms: 02

Length of first Arm 1000 mm

Length of second arm 800 mm

Max. Degree of rotation at each arm: 300°

or betterMax.

Loading capacity:200Kg or better (Motorized Uplifting arm to lift the anesthesia machine as per compatibility.

Braking system: Electromagnetic or Electric or pneumatic brakes to control horizontal movement.

Electrical Sockets British Standard – 16 to 20 Pcs

LAN Data ports RJ45 or equivalent for PC – 2 Pc

Oxygen Outlet: 2Pcs

Medical Air 4 Bar 2 pcs

Vacuum Outlet: 2 pcs

Nitrous Oxide Outlet 2 pcs

AGSS Out let 2 PCS (Active or Passive I/O to Specify)

I.V Pole- 1 PC

Basket for Accessories.

CEILING MOUNTED SURGICAL PENDANT

Ceiling mounted Surgical Pendant system should be powder coated, hygienically smooth surface, impactand disinfectant resistant

Shelves – 3 or 4Pcs

Drawer – 1 or 2 Pcs

No. of Arms: 2

Length of first arm: 1000mm Length of second arm:800mm

Max. degree of rotation at each arm: 300°

or batterMax.

loading capacity:200Kg or better

Braking system: Electromagnetic or electric or pneumatic brakes to control horizontal movement.

Electrical Sockets British Standard – 16 to 20 Pcs

LAN Data ports RJ45 for PC – 1 PcTelephone Outlets RJ11 – 1Pc

Oxygen Outlet: 2Pcs

Medical Air 4 Bar: 2PcsVacuum Outlet: 2 Pcs

I.V Pole – 1 Pc

Basket for accessories

DOUBLE DOME LED OPERATING LIGHT WITH HD CAMERA

Refer to the Ceiling light specifications as defined in O.T/Surgery PVMS.

LAMINAR AIR FLOW CEILING SYSTEM

Laminar flow ceiling system should be round or square or rectangular base form to produce a germ-and particle leanarea through unidirectional homogeneous, low turbulence laminar air flow. Return air grill with fluff separator 08 set for each theater.

All components for the receptacle of the filter element should be made of corrosion-proof

materials. Airtight welded filter intake made of aluminum

TECHNICAL DATA (All numerical values are approximate)

Total Air Flow: 6360 m3/hAirVelocity:0.25m/s

Filter Class to EN1822: H14|99.998%Initial Pressure drop: 115 Pa

Final Pressure drop (Recommended): 240 Pa

Size: 2800 x 2800 mm or Diameter: 3000mm According to Standard

Positive pressure should be maintaining inside the OT to prevent contamination of air from outside

OTOR As per drawing/actual requirement of the hospital.

Potential differential monitoring provision on surgeon pendant.

DEDICATED HYGIENIC AIR HANDLING UNIT (Euro vent / Cetiat / Equivalent certified)

- Local provision for the theaters (If already not installed HVAC System)
- Fan Type: Plug-fan
- Filter: At least three stage filtrations in AHU G4, F9 and F7
- Fan efficiency :70% or batter
- Temperature range adjustable for heating and cooling

OR as per drawing or actual requirement of the hospital

- Unit should have humidification & Dehumidification Provision built in or equivalent.
- Constant air flow control.
- Unit should be design criteria 70 % regulated air and 30% of fresh air.
- Casing should be water proof.
- Ambient temperature as site (I/O to specify at the finalization of bidding documents.)
- RH Factor built in or equivalent.
- Temperature regulation 20 to 26 degree.
- Technical Date Sheet / Scheduled will be provide along with the bid.

Surgeon Control Panel.

- Touch screen provides visual information about the current status of the monitored operating theatre systems and allows controlling and setting of the essential physical. Latest Type 20-25” TFT/LCD Display.

Control & monitoring

- Room Ceiling Lighting Control (On/Off - Dimming, White & RGB)
- Digital Clock and stopwatch

- Temperature and Humidity Monitoring
- Medical Gases - Alarm high/low.

Optional:

- R.G.B Light. As per demand of end user
- Lead lining (the procuring agency will specify the BOQ at the time of procurement if required)

Note: The System Should be complete with all standard accessories to keep the smooth working condition. All Minor Civil, electric, Plumbing and renovation work will be responsibility of bidders.

Clinical Specialty	**OT General Surgery**
Generic Name	**OPERATING HEAD LIGHT XENON/LED WITH LIGHTSOURCE**
Clinical Purpose	Operating theatre light for emergency and elective surgery.
TECHNICAL SPECIFICATIONS	
LED/Xenon Head Light Sources (end-user to specify). Light source Xenon 100 or 150 watts (end-user to specify). In case of LED watts will not applicable. Head band carrying Battery with fiber connection to the light with rechargeable battery and charger Note: The system should be with complete all standard accessories.	

Clinical Specialty	**OT General Surgery**
Generic Name	**HEAVY DUTY MOBILE AIR PURIFICATION SYSTEM**
Clinical Purpose	Mobile air purification system is used to remove contaminants fromthe air in a room, theater and ICU etc.

TECHNICAL SPECIFICATIONS

- Touch Screen or LCD Control Panel Air purification system for the removal of bacteria, viruses, mold spores from indoor areas of hospitals, operation theatre, ICU and Wards.
- With filter less technology or in case of filer it should be ULPA/H14 filter with five years free replacement of filter
- Cleaning capacity maximum 1000 to 1200 m3/h or more
- Cleaning efficiency 99 %.
- Sound level @100 m3/hr.: 40 dB or less.

Clinical Specialty	**OT General Surgery**
Generic Name	**MOBILE AIR PURIFICATION SYSTEM**
Clinical Purpose	Mobile air purification system is used to remove contaminants fromthe air in a room, theater and ICU etc.
TECHNICAL SPECIFICATIONS	
Air purification system for the removal of bacteria, viruses, mold spores and gases from indoor areas of hospitals, operation theatre, ICU and Wards. Ionization of Gases. With filter less technology or ULPA filter or H14 Filter. Cleaning capacity maximum 500-720 m3/h or 800-850 m3/h (End user to specify). Cleaning efficiency 99 %. Sound level 700-720 m3/hr.: 55 dB or less. Sound level 800-850 m3/hr.: 52 dB or less.	

Clinical Specialty	**OT General Surgery**
Generic Name	**MOBILE HYDROGEN PER OXIDE CLEANING AND DISINFECTION SYSTEM**
Clinical Purpose	Mobile Surface Cleaning and Disinfection system is used to remove contaminants fromthe surface of OT Structure, OT Table TOP, BEDS, TROLLEYS in a room, theater and ICU etc.

TECHNICAL SPECIFICATIONS

- Mobile combo Disinfection unit for Surface Disinfection of OT Walls, Floors, Surface of Equipment used in Operation Theatre, ICU and Nursery
- Mobile trolley mounted system that ensures high level of cleaning and Disinfection.
- With combination of steam and low concentration base Hydrogen per Oxide.
- The system should also be able to use with saturated steam only.
- LCD control screen for operator.
- Able to be use at least 8 hours per or more
- Built in Steam generator.
- Electronic monitoring of steam pressure and temperature to secure disinfection efficacy
- Steam output regulation not less than 05 levels.
- Steam stainless steel filter protecting electro valve
- Self-filling magnetic contactor
- Electric and electronic box waterproof.
- All fluid circuit adapted to H^2O^2
- Injection chamber of H^2O^2 design to get a perfect homogeneous steam – H^2O^2 mix to ensure disinfection

Following Accessories should be provided with each Unit

- Steam hose 4.5 meter
- Refill tank connector for Hydrogen peroxide with
- sealing Kit

- Bent steam nozzle Microfiber mount Lance 50 cm
- 2-3 litters tank of hydrogen peroxide 7.5% or better.
- Floor Steam MOP

Generic Name	**FULLY AUTOMATIC MOBILE FUMIGATION AND DISINFECTION SYSTEM**
Clinical Purpose	Mobile Surface Cleaning and Disinfection system is used to remove contaminants fromthe surface of OT Structure, OT Table TOP, BEDS, TROLLEYS in a room, theater and ICU etc.
TECHNICAL SPECIFICATIONS	
Remote Control Fully Automatic Mobile Disinfection unit for Surface Disinfection of Operation Theatre, ICU, CCU, Nursery and Other Wards of the Hospital. The unit should have fully automatic operation and should start fumigation once required area of disinfection is enter through touch screen or touch pad display. Built in turbine and Heating system for effective fumigation Unit should be able to treat 1800 to 2000 M3 area or 10 to 1000 M3. (I/O to specify) Rotation speed of the turbine should be 20000 to 22000 trs/min or more. Built in Compartment for storage supply of chemicals. 220V 50 Hz	

Clinical Specialty	**OT General Surgery**
Generic Name	**HAND HELD DOPPLER**
Clinical Purpose	Hand Held Doppler is used for the assessment of peripheral vessels
Vascular Probes 4, 5 and 8. MHz Main unit should have LCD Display of waveform and numerical data	

Clinical Specialty	**O.T General Surgery**
Generic Name	**BASIC BOX SIMULATORS (LOW FIDELITY)**
Clinical Purpose	Simulators provide teaching aid and are used in skill lab of any teaching hospital.

TECHNICAL SPECIFICATIONS

Laparoscopic training simulator (box type) with FLS approved compatible training exercises

Laparoscopic surgical instruments

- 2 x needle holders
- 2 x graspers
- 1 x marry land
- 1 x scissors
- 1 x Knot pusher

Note:

The generalized specifications of Simulators to be prepared by the end-user. The end-user shall certify the generalization of specifications and get it approved from the concerned committee and competent authority before the process of procurement.

Clinical Specialty	**O.T General Surgery**
Generic Name	**Power Stappling System**
Clinical Purpose	To develop and expand minimally invasive surgery

TECHNICAL SPECIFICATIONS

The Reusable Powered Stapler measures the force to clamp and Ore the stapler. Three firing zones were developed based on force measurements in variable tissue thicknesses, firing speeds should programmed for each zone to optimize staple formation, higher force measurements should be indicating thicker tissues, more challenging tissue conditions, additional material in the jaws, or maximum device

articulation. System display feedback on an LED screen, before and during firing. The system must have capabilities to be used from 300 or more procedures with one powered platform.

The powered stapler with feedback with force sensing technology to adjust firing speeds to optimize staple formation when stapling in different and variable tissue thicknesses, with following key feature for accuracy and patient safety

Sets the initial firing speed based on the clamp force measurement

Continually measures force when firing

Stops firing if' force reaches the mechanical limits of the system

System with following accessories:

Reusable Powered Stapling Platform

Sterile Power Control Shells

Reusable Powered Linear Adapter Standard Length

Reusable Powered Linear Adapter Short

Rour-Bay Smart Charger

Reusable Insertion Guide

Manual Retraction Tool

Sterilization Tray Powered Cartridge Multi use Loading unit 45mm, 60mm Vascular and Medium Thick Cartridges 45mm, 60mm

Clinical Specialty	**O.T General Surgery**
Generic Name	**Vein Finder**
Clinical Purpose	Vein Finder projects near-infrared light with no radiation. The near-infrared light is absorbed by the blood and reflected by the surrounding tissue to present a clear image of a patient's vein pattern.
TECHNICAL SPECIFICATIONS	
Digital IR type Vein finder, Hand held type, Indication light for machine status, battery, battery operated The battery backup time should be 2 hours or more. Different Projection display colors. different modes and sizes for depth detection, adjustable brightness, depth of investigation 6 mm or more, light weight, detection of subcutaneous bleeding, superficial veins Mobile hand-held device to be replaced with mobile trolley/ stand local made.	

Clinical Specialty	**O.T General Surgery**
Generic Name	**Automatic Shoe Cover Machine**
Clinical Purpose	A device to isolate Operation Theater and ICU from another environment
TECHNICAL SPECIFICATIONS	
An automatic machine to wrap the shoe Packaging material: Plastic Driven type: Electric and Digital Capacity of shoe cover: Minimum 1000pcs Automatic grade: Automatic Useful Life: >300,000 or better Pre-Heating time: <185s or better Film Delivery time: <5s or better Film shaping time: <5s or better	

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Clinical Specialty	**O.T General Surgery**
Generic Name	**Audio Video Management System**
Clinical Purpose	For Teaching and Training Purpose and make the minimal invasive surgery documentation or case study. will be help for all the institute having the College, to take the second opinion while surgery and to broadcast

TECHNICAL SPECIFICATIONS

General Description: Should be modern, lightweight and interconnecting integration solution, The system offers 4K and 3D UHD A/V distribution inside the OT, documentation and audiovisual communication within the hospital environment, designed to be operated from the most compact device in its class.

Should be with Compact in design.

- A/V Management Video in the operating room – with Signal 4K UHD, 3D and FULL HD according to system.
- Documentation Content management in up to 4K UHD – from the endoscope tower to the HIS.
- Communication Video streaming and audio talkback with bidirectional with elastration.

Must Provide brilliant surgical image quality and content management in up to 4K UHD, from the endoscope to the Hospital Information System. Ensures connectivity and management of all its elements - cameras, video sources, monitors and network connected Participants.

To Experience real time communication with collaboration partners within the hospital.

High-definition video streaming to share the surgical image with other consultants or an auditorium in a secure and privacy protected environment.

Must Provide Seamless communication be ensured with onboard audio talkback function. Emphasize important anatomical or pathological structures with live video annotations.

Elastration on the touchscreen inside the OT can be used to visually annotate the streamed image. Get important consultation of another expert during the surgery should provide Powerful audiovisual communication function. Video streaming and audio talkback with bidirectional Elastration.

8x8 or More video management system in 4K UHD, 3D and FULL HD including PiP/PaP functionality.

Must Provide integrated **documentation** solution in up to 4K UHD

Medical education takes time. Share procedures intraoperatively beyond the OT.

Must Support HL7 and DICOM

Note:

Preparation of Room In all respected will be the responsibility of Vendor like:

Ceiling/ Wall mount Loudspeaker

LCD/LED Non-Medical Grade for Display

Wireless Microphone 24 GHz

Local LAN NETWORK if required

Quantity of the local scope of work will be according to design or as per recommendation of the End-user

Clinical Specialty	**O.T General Surgery**
Generic Name	**Cell saver and auto-transfusion machine**
Clinical Purpose	The Cell Saver Elite System is intended for surgeries such as CABG, valve replacement, trauma, transplants, orthopedic, and other procedures in which medium to high blood loss occurs. With its ability to deliver high hematocrit and remove nearly all traces of undesirable components, the Cell Saver Elite is a critical tool in your efforts to avoid unnecessary allogeneic transfusions while eliminating the costs related to blood bank transfusion.
TECHNICAL SPECIFICATIONS	
Pump speed: 0–1000 mL/min (adjustable) Centrifuge speed: Latham bowl: 5650 rpm or Better Single or Blow-molded bowl: 7500 rpm or better Sequestration: 2000-6000 rpm (adjustable) Laser classification: Class 3R laser product Power cord length: 16 ft (4.9 m) or better.	

Clinical Specialty	**O.T General Surgery**
Generic Name	**Gamma camera with probe**
Clinical Purpose	• Real-time localization of sentinel lymph nodes • ROLL: Radio-guided occult lesion localization • SNOLL: Sentinel node and occult lesion localization • Research: fast high-resolution planar imaging of Tc-99m labeled tissue

TECHNICAL SPECIFICATIONS

- cadmium zinc telluride (CZT) imaging detector (5-6mm thickness)
- field of view 40x40mm² or better
- 256 pixels (16x16) with 2.46 mm pixel pitch or better
- energy range 40 keV to 250 keV
- energy resolution < 7% at 140 keV
- side shielding of 99.97% against undesired gamma radiation (at 140 keV)
- weight < 800g including collimator and integrated side shielding
- real-time visualization using arbitrary acquisition times (starting from 100 milliseconds)
- DICOM compatible image processing
- optional battery operation using a laptop computer

Clinical Specialty	**O.T General Surgery**
Generic Name	**Patient transfer boards**
Clinical Purpose	For transfer of the patients from bed to trolleys or from bed to bed
TECHNICAL SPECIFICATIONS	
• Size: L1525mm x W635mm Approx. Materia of the board should be disinfected with local available disinfection solution.	

Clinical Specialty	**O.T General Surgery**
Generic Name	**Ultrasonic Surgical aspirator**
Clinical Purpose	For liver resection during liver tumor surgery and liver transplant. Can be also used select9velyv in trauma. Also used in brain surgery

TECHNICAL SPECIFICATIONS

TRANSDUCER CHARACTERISTICS

Permanently housed in handpiece

SURGICAL USES Neurosurgery, general, gynecology, urology, laparoscopy, thoracic, gastrointestinal, orthopedic, thoracoscopic, plastic and reconstructive surgery. ERROR CODE INDICATIONS Footswitch, handpiece, cooling water, vibration fault indicators

FLUIDIC MODE

Aspiration, 0-660 mm hg or better.

Flow rate, cc/min 1-29, variable

Irrigation system

Fluid Saline

HANDPIECE CHARACTERISTICS Both open and laparoscopic shears Straight 23 and 36 khz

Angled extended Angled extended tips Angled 23 and 36 khz

Additional Laparoscopic tip, extended length tip for trans nasal or Transsphenoidal" procedures, bone cutting tip. Multiple use/ single use Both Type Titanium

TIP Straight extended tips

Clinical Specialty	**General Surgery**
Generic Name	**SURGICAL ROBOTIC SYSTEM**
Clinical Purpose	To be Used in Minimal Invasive Robot Assisted Operative Procedure

TECHNICAL SPECIFICATIONS

The equipment must be capable of performing minimally invasive robot assisted operative procedures in multi therapeutic areas. The provided system must be the latest generation/ later model at the time of procurement.

The Main Equipment should comprise of the following fully integrated subsystems.

An ergonomic console: - on which the surgeon can operate seated comfortably from a distance by hand controls on the console and issuing instructions at the instrument which are connected to the different arms of the robot. The motion of the hands of the surgeon needs to be scaled and need to be translated for the instrument arms of the robot in a very fine and precise manner

Robot Arms: - Modular, separate and interchangeable instrument arms that are capable of holding instruments and one arm for endoscopic camera for performing robotic surgery.

A Video system: - of high quality to process and transmit the video information during the intervention. This system needs to produce high-definition 3D image through the camera to get a perception of depth.

Ultra-High-quality 3D view: of the field using next generation light adapting technology. The elimination of any focusing required with infinite depth of field technology.

System should be capable for virtual training with the Surgeon Console to practice & enhance surgical skills of new & existing robotic surgeons.

System should be Capable enough to use

Reusable, Autoclave able instrumentation: - the system should allow for robotic control of instruments that are reusable.

The instruments should be able to be cleaned and sterilized using autoclave technology and not require additional, less standard sterilization method.

High-quality three-dimensional view of the field of operation is to be provided by the Vision system through its stereo endoscope.

LED light source to be provided for illumination of the surgical field with a standby lamp.

Instruments to be used with the system should be able to provide surgeons with natural dexterity and a range of motion equal to the human hand.

Such instruments should be able to offer a wide range of tips suitable for performing procedures across multiple disciplines. These Instruments shall offer Seven degrees of motion mimicking the dexterity of human Hand with 720 degrees of shaft rotation.

The hand controllers at the surgeon's console should be capable of translating the natural hand and wrist movements in to corresponding precise and scaled movements to the instruments and camera attached to the arms minimizing fatigue. Such movements of the instrument tips shall replicate the experience of open surgery.

There should be facility for scaling of surgeon hand movements to corresponding smaller instrument tip movements. The surgeons hand movements shall be replicated at the instrument tip after filtering tremors if any in real time.

The endoscopes should be capable to view at 0 degree and 30 degrees.

The ability to quickly change instruments during surgery should be a key feature.

Camera should provide high resolution images of the operative field along with perception of depth of field.

The system should perform self-checks to provide safety during usage

The system should have software required to safely use the system. Software upgrades should be given free of charge to the institution to ensure the latest version of software is always running on the system - without expense to the institution

Ability to change instruments during surgery safely with proper guidance

Auxiliary Monitor to provide ability for the assistants in the OR to see surgeon's view.

Ability to adjust the surgeons monitor and console to suit individual comfort and ergonomics should be available.

Ability to enable the surgeon to view 2D as well as 3D HD image

While the robotic arms shall be operated by sterile persons the surgeons console shall be non-sterile are in the Operating room.

Adequate safety features to prevent inadvertent movements of the surgeon affecting the instruments shall be available.

The arms shall be easily movable within the OR.

The system shall have all software required to support all disciplines of surgery which is possible by the system under the control of the surgeon.

Ability to change the instruments during surgery safely

All equipment shall be capable of working on 230 V AC, +/- 5%, 50 Hz Power supply. The system shall be capable of working between 17 to 25 Deg C air-conditioned environment.

Emergency spares that may be required for immediate replacement during procedures. A set of Reusable accessories required for common procedures

Instrument for 200 procedures should be included in the package which includes hook, dissectors, needle holder, and energy instruments (Monopolar & Bipolar)

Clinical Specialty	OT and General Surgery equipment
Generic Name	**Laparoscopic virtual reality Simulator**
Clinical Purpose	General Surgery & Laparoscopic surgery training.

TECHNICAL SPECIFICATIONS

Laparoscopic virtual reality Simulator cart with integrated haptics technology

Laparoscopic training procedures and essential skills task simulator with Advanced graphics, haptics, and real patient cases represent in-situ surgical experiences.

24" flat screen monitor

Dual foot-pedal for cautery and advanced energy activation

Pistol grip handles

Needle driver handles

Essential Skills Module

Lap Cholecystectomy Module

Running the Bowel Module

OB/GYN Module

Suturing and Knot Tying Module

Electronic user guide

Assurance Plan with software updates

- Replicates laparoscopic procedures with accurate haptic technology
- Patient cases developed using real patient data and physiological models
- Essential Skills Module includes:
    1. camera navigation
    2. peg transfer
    3. cutting
    4. clipping,
    5. needle driving
    6. knot tying
- Procedural Skills Module includes
    1. Adhesiolysis
    2. running the bowel
    3. suturing
    4. knot tying
    5. loop litigation

- General Surgical Procedures Module includes
    1. laparoscopic appendectomy
    2. laparoscopic cholecystectomy
- OB-GYN Procedures Module includes
    1. minimally invasive bilateral tubal occlusion
    2. tubal ectopic pregnancy
    3. salpingo-oophorectomy
- Female Pelvis with general pathology ultrasound training Model containing a Uterus with:

1. Prominent Endometrium
2. Left and Right Ovaries
3. Periovarian Abscess
4. Broad Ligaments
5. Ovarian Follicles
6. Free Fluid in the Cul-de-Sac
7. Bowel, Bladder
8. Accessory Pelvic Structures

- Ability to use two instruments with six degrees of freedom
- Includes two pairs of handle attachments
    1. pistol grip attachments and suturing attachments
- Instructor has ability to restrict instrument selection on either hand
- Camera includes five degrees of freedom, adjustable virtual lenses, and image capture
- Dual foot pedal for electro-surgery and advanced energy devices
- Software includes didactic content for tasks
- covering training objectives, instructions, demos, case history, pre-procedures, parameters, and post-procedures
- Software includes metrics to track time, proficiency, dexterity and complications on each task and compare a learner's results with the instructor's established acceptable results
- Software compiles usage summaries for learners containing metrics on duration, and skills and cases completed
- Ability to customize certain case parameters to match the learner's skill level and interests varies by simulated procedure.

Clinical Specialty	**O.T General Surgery**
Generic Name	**Smoke Evacuator**
Clinical Purpose	The smoke evacuator is innovative suction units, which have been designed to evacuate and filter the smoke produced during all the electro-surgical procedures, by eliminating the bad smells or the bacteriological risks, and by solving the very common problem of the visual field during the laparoscopic procedures.

TECHNICAL SPECIFICATIONS

The system should be microprocessor controlled.

The system should be equipped with an electric suction at high flow and medium noise

The system should also have a high suction which should be used for (gynecology, minor surgery, laser and other).

System should have three stage or better filter one disposable HEPA Type filter with efficiency 99. %, One anti-bacterial ULPA type with efficiency 99% and one anti-smell with active carbon control by a microprocessor.

The system should have automatic switching on/ switch off of the suction unit when every time unit is activated through a non-contact sensing which eliminates the need of both specific connection to the electrosurgical unit and pedal.

Adjustment of the delay in the switching off of the suction system from 0 to 30 sec or better in order to completely eliminate the smoke.

Technical specification:

Flow rate standard mode 600-800 L/min or better

220-volt 50 Hz

Clinical Specialty	O.T General Surgery
Generic Name	**BIO-DECONTAMINATION SYSTEM**
Clinical Purpose	Mobile Surface Cleaning and Disinfection system is used to remove contaminants fromthe surface of OT Structure.

TECHNICAL SPECIFICATIONS

- User Friendly Mobile/Portable automatic bio-decontamination system for room air and surface disinfection of Hospital Wards, ICUs & Operation Theatre etc.
- Applicable in every area of the hospital which is beyond human approach or difficult to approach.
- Must have effective on the room of volume up to 850 m3
- The hydrogen per oxide ready to use disinfectant H2O2 6% or more according to approved USA/Europe Standard for Health Facilities
- Modern and Validate able Fogging technology.
- Disinfection dispersal speed 3ml/m3 to 6ml/m3.
- Automatic program on/off according to operational requirements.
- The system must comply with European Standard
- Able to holds chemical for disinfection canister 2 L or more
- Can also be used for disinfection in OT, ICU HVAC Duct and Hospital Highly sensitive areas.

Note: if the any procuring agency required any kind of clarification regarding the specifications may contact to the SHC & ME Department or PVMS Committee.

SPECIALIZED HEALTH CARE AND MEDICAL EDUCATION DEPARTMENT

GOVERNMENT OF THE PUNJAB

PRODUCT VOCABULARY MEDICAL STORE (PVMS) OF UROLOGY EQUIPMENT

Volume - II, 2021

Contents

Clinical Specialty	Urology
Generic Name	**ADULT BASIC UROLOGY SET**
Clinical Purpose	Urology also known as genitourinary surgery, which is the branch of medicine that focuses on surgical and medical diseases of the male, female urinary tract system and female reproductive organs. The organs under the domain of urology include kidneys, adrenal glands, ureters, urinary bladder, urethra, and the male reproductive organs testes, epididymis, vas deferens, seminal vesicles, prostate and penis

TECHNICAL SPECIFICATIONS

Cystoscope With Accessories (For Adults)

Telescope 30° Degree, 4mm, Autoclavable length 30cm Cystoscope-Urethroscope Sheath 19 to 25 Fr, with Obdurate Cystoscope-Urethroscope Sheath 17 to 20 Fr, with Obdurate Telescope Bridge with 1 Lockable instrument channels

Grasping Forceps Compatible Double action jaws, Flexible Length 30 to 40 cm

Resectoscope With Accessories (For Adults)

Telescope 25°- 30° Degree, 4mm, Autoclavable length 30cm Working element active / passive.

Resectoscope sheath, including connecting tubes for in and outflow 26Fr, Rotatable inner tube with ceramic insulation

Outer Sheath 26 FR Inner Sheath 24 FR Standard Obturator Visual Obturator

Unipolar High Frequency cord, with 4mm plug, Length 300cm Glass syringe 100ml to 150ml

Cutting Loop Urethrotome (For Adults)

Telescope 0° - 12° Degree, 4mm, Autoclavable length 30cm Working element active/ passive.

Urethrotome Sheath, 21-22Fr, with channel for Fusiform Boogies Obturator, for Urethrotome sheath, 21-22Fr

Supplementary Sheath, half round to insert a balloon catheter to slip on Urethrotome sheath

Set of 4-5 Cold knife Stone Punch (For Adults) Stone working element

Sheath for working element

Obturator for Sheath

Ellick evacuator

Camera as per end user choice defined separately in PVMS Urology

Accessories

Nil

Optional (If Any)

Nil

Clinical Specialty	Pediatric Urology
Generic Name	**NEONATAL UROLOGY BASIC SET**
Clinical Purpose	Pediatric urology is a surgical super specialty of urology & pediatric surgery dealing with the disorders of children's genitourinary systems (boys and girls) from birth to adolescence. This supra specialty concerned with anatomy, physiology, clinical recognition and treatment of various congenital & acquired diseases of Genito-urinary tract in children.

TECHNICAL SPECIFICATIONS

CYSTOSCOPE SET FOR NEONATES
Telescope 0° Degree (1.2-1.9mm)
Cystoscope Sheath 7.0 -8.5 Fr
Pediatric Biopsy Forceps Flexible (Compatible with sets 3 Fr)
Button Electrode (Compatible with sets)
Cold knife Triangular 3 Fr (compatible with set)
Hook electrode 3 Fr
HF Cable

CYSTOSCOPE SET FOR INFANTS & CHILDREN
Telescope 0°/30°/70° Degree (1.2mm, 1.9mm, 2.7mm)
Cystoscope Sheath (9.0Fr - 14Fr)
Adopter with 1 Instrument port
Insert with Deflector
Operating (Compact) cysto-urethroscope 5^0 - 12^0 Degree (7.5 - 12 Fr) with straight working channel
Grasping Forceps Flexible 3-5 Fr
Biopsy Forceps Flexible 3-5 Fr
Cold knife Triangular 3 Fr (compatible with set)
Hook electrode 3-5 Fr
Button Electrode 3-5 Fr
HF Cable

RESECTOSCOPE FOR NEONATES
Telescope 0° 30^0 Degree (1.9 mm)
Resectoscope Sheath 8-9 Fr
Instrument port
Working Element
Cutting Loop
Hook electrode
Coagulating electrode

RESECTOSCOPE FOR INFANTS & CHILDREN
Telescope 0° 30^0 Degree (1.9-2.7 mm)
Resectoscope Sheath 11-13 Fr
Instrument port
Telescope Bridge compatible
Working Element with electrode attachment
Cutting Loop
Hook electrode
Coagulating electrode
Grasping Forceps 3-5 Fr
Endoscopic Micro scissors 5 Fr
Bladder syringe compatible 50-100 ml

Accessories:
Sterilization Container

Protection Tube **Camera and Tower as per end user choice defined separately in PVMS Urology**
Accessories: Nil
Optional (if any): Operating (Compact) cysto-urethroscope 5^0 – 7^0 Degree (4.5/6.5 Fr) with straight working channel Injection Needle 3 Fr Foreign Body optical Forceps 14 Fr Optical Forceps (rigid) 14 Fr Optical Biopsy forceps 14 Fr

Clinical Specialty	Pediatric Urology
Generic Name	**PEDIATRIC UROLOGY BASIC SET**
Clinical Purpose	Pediatric urology is a surgical super specialty of urology & pediatric surgery dealing with the disorders of children's genitourinary systems (boys and girls) from birth to adolescence. This supra specialty concerned with anatomy, physiology, clinical recognition and treatment of various congenital & acquired diseases of Genito-urinary tract in children.

TECHNICAL SPECIFICATIONS

OPTICAL URETHROTOME PAEDS
Telescope 0° Degree (1.9 mm)
Urethrotome Sheath 8.0Fr to 11Fr Instrument port compatible with sheath
Working Element
Set of 4-5 Cold Knife (Straight, round, sickle & hook)
Protection Sheath

CYSTOCOPE & RESECTOSCOPE FOR ADOLESCENT
Telescope 0° 30^0 Degree (2.7 mm)
Cystoscope sheath 14-15 Fr
Resectoscope Sheath 14-15 Fr
Telescope Bridge compatible
Instrument port
Working Element with electrode attachment
Cutting Loop
Hook electrode
Coagulating electrode
Grasping Forceps 5-7 Fr
Cold knife (Straight, round, sickle & hook)
Endoscopic Micro scissors 5-7 Fr
Bladder syringe compatible 50-150 ml

Camera and Tower as per end user choice defined separately in PVMS Urology

Accessories:
Nil

Optional (if any):
Nil

Clinical Specialty	Pediatric Urology
Generic Name	**URS PEDIATRIC SEMI RIGID**
Clinical Purpose	URS is endoscopy of ureter and pelvis that is used to break the stones.
TECHNICAL SPECIFICATIONS	
URS 4.5-7.3 Fr, $5^0 – 6^0$, Length 25-57cm, working channel 3-4 Fr or better Silicone automatic valve, ø 3.9 mm, 5 pieces / package Rubber cap for instrument channel Flexible cleaning brush for instrument channel Grasping Forceps (Compatible with sets) Biopsy Forceps (Compatible with sets) Insert Aid **Camera and Tower as per end user choice defined separately in PVMS Urology**	
Accessories: Nil	
Optional (if any): Nil	

Clinical Specialty	Pediatric Urology
Generic Name	**PEDIATRIC MINI PCNL SET**
Clinical Purpose	Percutaneous nephrolithotomy (PCNL) is a minimally-invasive procedure to remove stones from the kidney by a small puncture wound (up to about 1 cm) through the skin. It is most suitable to remove stones of more than 2 cm in size and which are present near the pelvic region. It is usually done under general anesthesia or spinal Anesthesia
TECHNICAL SPECIFICATIONS	
Consist of telescope 7-12 degree or better eye piece Operating Sheath Size 7.5 to 12 Fr or better Instrument channel 6.5 to 7.5 fr for instrument and irrigation for mini Nephroscope Continuous irrigation Nephroscope Sheaths 11-21 Fr or better Minimum 3 sizes operating sheath with Dailators compatible with the Nephroscope and all accessories stone grasping forceps, 2 / 3 prong stone grasper Grasping forceps with alligator Jaw Compatible suction irrigation pump **Camera as per end user choice defined separately in PVMS Urology**	
Accessories: Nil	
Optional (if any): Nil	

Clinical Specialty	Pediatric Urology
Generic Name	**PEDIATRIC MICRO PCNL SET**
Clinical Purpose	This is further miniaturization of Mini PCNL and it is done always with LASER technology (stone dusting).

TECHNICAL SPECIFICATIONS

Semi rigid optic/Telescope modular PCNL 10,000 pixel / 120°
Optic shifter
Micro PCNL Sheath 7.8 Fr or less
Pump for grasping stone Sterilization Container
Compatible suction irrigation pump
(All accessories must be compatible with sheath size of the manufacturer)

Nephroscope Catheter – Needle Disposable (set of 6)

Required Parameter:-

- Outer diameter: 4.6 Fr
- Working channel: 3.6 Fr
- Working length: 152mm

Fiber Nephroscope.

Required Parameter:-

- Working length: 850mm
- Working channel: 0.8mm
- Field of view: > 80 degree
- Direction of view: 0
- Resolution: 10000 pixel
- Sterilization Methods: Ethylene Oxide Gas & Low Temp Plasma

Accessories:
Nil

Optional (if any):
Nil

Clinical Specialty	Urology
Generic Name	**URS SEMI RIGID SET**
Clinical Purpose	URS is endoscopy of ureter and pelvis that is used to break the stones.
TECHNICAL SPECIFICATIONS	
Uretero-renoscope, Autoclavable, Semi Rigid Tip size 6-9Fr, Angle: 5-12 degree Working Length: 43cm Instrument Channel with lateral offset eye piece or Equivalent Silicone automatic valve, ø 3.9 mm, 5 pieces / package Rubber cap for instrument channel Flexible cleaning brush for instrument channel Grasping Forceps (Compatible with sets) Biopsy Forceps (Compatible with sets) 2-3 prong forceps (Compatible with Set) Sterilization Tray compatible with sets **Camera as per end user choice defined separately in PVMS Urology**	
Accessories: ▪ Stone Basket	
Optional (if any): Nil	

Clinical Specialty	Urology
Generic Name	**VIDEO FLEXIBLE URS ADULT**
Clinical Purpose	Endoscopy means looking inside and typically refers to looking inside the body for medical reasons using an endoscope, an instrument used to examine the interior of a hollow organ or cavity of the body. Unlike most other medical imaging techniques, endoscopes are inserted directly into the organ.
TECHNICAL SPECIFICATIONS	
Flexible Video URS Set with Chip on tip **Comprising of:** Cleaning brush (pack of 10 pcs) Adapter Leakage tester Pressure equalization valve / clamping element Pack of 20 with container **TECHNICAL DATA** Distal tip: cylindrical, atraumatic, Sheath diameter: 8.5 to 9.9 Fr or better Number of working channels: 2 Channel or 1 Channel with two port bridge. Angulations: 270° or better Upward/Downward, Viewing angle: 80° or more Working length: 60 – 70 cm **Camera as per end user choice defined separately in PVMS Urology**	
Accessories: Ureteric access sheath different size (Compatible)	
Optional (If Any): Nil	

Clinical Specialty	Urology
Generic Name	**FIBEROSCOPE FLEXIBLE URS**
Clinical Purpose	Endoscopy means looking inside and typically refers to looking inside the body for medical reasons using an endoscope, an instrument used to examine the interior of a hollow organ or cavity of the body. Unlike most other medical imaging techniques, endoscopes are inserted directly into the organ.

TECHNICAL SPECIFICATIONS

Uretero-Fiberscope

Deflection of distal tip	270° / -270° Direction of
view	0°
Angle of view	85° or better
working channel inner	3.6Fr
Sheath Size	7.5Fr – 8.5Fr or better
working length	70 - 67cm Approx. Carrying Case

Pressure compensation cap / ETO cap
Leakage tester, Bulb and manometer cleaning brush, flexible for working channel
Diameter 1.2-1.8mm, Double action jaw (Grasper),flexible Biopsy forceps Compatible, Double action jaw, flexible Stone basket, Sterile, Disposable, 2.5Fr
Coagulation electrode, 3Fr, Unipolar
Guide wire, 3Fr, with ball end, sterile, package of 10 Sealing for instrument ports
Package of 10 (Single Use)
Cleaning adaptor for instrument ports
Camera as per end user choice defined separately in PVMS Urology

Accessories:
Nil

Optional (If Any):
Nil

Clinical Specialty	Urology
Generic Name	**VIDEO CYSTOSCOPE URETHEROSCOPE**
Clinical Purpose	Cystoscopy is endoscopy of the urinary bladder via the urethra. It is carried out with a Cystoscope.

TECHNICAL SPECIFICATIONS

Video Cysto-Urethroscope

Sensor steerable Specification:

Working channel inner	Diameter 6-6.5Fr
Direction of view	0°
Deflection:	UP: 210 Deg, Down: 140 Deg
Angle of view	120°
Sheath size	16Fr
Working length	37cm-40 Cm
Carrying case	

Grasping forceps

Biopsy forceps, Compatible Pressure compensation cap Leakage tester

Cleaning brush

Adaptor

Coagulation electrode, unipolar, 4Fr., length 73cm

Unipolar high frequency cord, with 4mm plug, length 300cm

Sealing for instrument ports and package of 10, single use recommended cleaning brush for instrument ports

Trolley imported

Plastic container for flexible endoscopes, suitable for gas and hydrogen peroxide sterilization

Camera as per end user choice defined separately in PVMS Urology

Accessories:

Nil

Optional (If Any):

Nil

Clinical Specialty	Urology
Generic Name	**CYSTO-URETHRO-FIBERSCOPE**
Clinical Purpose	Cystoscopy is endoscopy of the urinary bladder via the urethra. It is carried out with a Cystoscope.
TECHNICAL SPECIFICATIONS	
Instrument channel 4 – 7 Fr or Above Direction of view: 0° Angle of view 100 to 110° or Better Working length 37cm – 45 Cm Approx. Outer Diameter: 14Fr to 16Fr or above Deflection: UP: 210 Deg, Down: 120 Deg or better Carrying case Grasping Forceps, Compatible Biopsy forceps, Compatible Pressure compensation Cap Leakage tester cleaning brush Stone basket, 5Fr. Coagulation Electrode, Unipolar, 4Fr. Sealing for instrument ports package of 10, recommended cleaning adaptor for instrument ports **Camera as per end user choice defined separately in PVMS Urology**	
Accessories: Nil	
Optional (If Any): Nil	

Clinical Specialty	Urology
Generic Name	**MOBILE VIDEO CYSTOSCOPE URETHEROSCOPE**
Clinical Purpose	Cystoscopy is endoscopy of the urinary bladder via the urethra. It is carried out with a Cystoscope. Mobile cystoscope is needed for easily move from one theater to another.

TECHNICAL SPECIFICATIONS

Working channel inner Diameter 6-6.5Fr
Direction of view 0°
Deflection: UP: 210°, Down: 120°
Angle of view 120°
Sheath size 14-16.5Fr or above
Working length 37cm-40 Cm
Carrying case
Grasping forceps
Biopsy forceps, Compatible Pressure compensation cap Leakage tester
Cleaning brush Endoscope / Light guide Adaptor
Coagulation electrode, unipolar, 4Fr., length 73cm
Unipolar high frequency cord, with 4mm plug, length 300cm
Sealing for instrument ports and package of 10, Cleaning brush for instrument ports
Plastic container for flexible endoscopes, suitable for gas and hydrogen peroxide sterilization
Compatible 7" or better Monitor
Should have availability of Built-in / External Recording and Still image
Built-in Light Source LED miniature type

Accessories:
Nil

Optional (If Any):
Nil

Clinical Specialty	Urology
Generic Name	**BIPOLAR RESECTOSCOPE WITH ENUCLEATION**
Clinical Purpose	Bipolar resection of Prostate is beneficial for patients with cardiac problems. The organs under the domain of urology include the kidneys, adrenal glands, ureters, urinary bladder, urethra, and the male reproductive organs (testes, epididymis, vas deferens, seminal vesicles, prostate, and penis).

TECHNICAL SPECIFICATIONS

Straight forward oblique telescope 120 - 300, enlarged view, Ø4mm, Autoclavable at 134°C, Incorporated fiber optic light transmission Compatible adaptors
Working element set including Working element active/passive
Cutting loop, Bipolar coagulation electrode Bipolar High frequency cord for electro surgical unit high end. Length 300cm or more, for use with bipolar resectoscope
Resectoscope sheath, including connecting tubes for in-and outflow, 24/26Fr. Oblique beak, rotatable inner tube with ceramic insulation
Visual Obturator, for use with sheaths 24/26Fr. Cutting loop, bipolar, 24/26Fr., for use with telescope

Bipolar Diathermy
High Frequency 430 KHZ ± 20%
Maximum high Frequency power 320W or Better Output Modes & Power
8 Hemostatic Modes
Must have presets modes for all specialty
Selection of loops must indicate by diathermy unit
Software upgradable
True bipolar system (Current must be go back from loops)

PureCut:	300W
BlendCut:	200W
PulseCut Slow:	150W
PulseCut fast:	150W
SoftCoag:	120W
ForcedCoag:	120W
SprayCoag:	120W
BipolarCut:	100W
SalineCut:	100 to 200w
BiSoftCoag:	120W
AutoCoag:	120W
HardCoag:	120W
RFCoag:	220W

Accessories:
Nil

Optional (If Any):
Nil

Clinical Specialty	Urology
Generic Name	**PNEUMATIC / ELECTRO KINETIC / ULTRASONIC INTRACORPOREAL LITHOTRIPSY SYSTEM**
Clinical Purpose	It is used for fragmentation of urinary stones

TECHNICAL SPECIFICATIONS

Pneumatic Intracorporeal Lithotripsy System

User Mode Set as a single shot or continuous shot
Output Energy 0-10 bar adjustable continuous or better
Average Pressure 4 to 5 bars
Working Air Pressure 0-8 bar compressed medical air
Frequency of use Max. 15 Hz or better
Electrical foot pedal
Power supply cable
Compressed air supply tube
Set of connectors for exhaust
Spare fuses
Pneumatic Hand piece kit
Standard Probe of all sizes
Ø 0.8 mm , length 640 mm or equivalent
Ø 1.0 mm , length 640 mm or equivalent
Ø 1.2 mm , length 640 mm or equivalent
Ø 1.5 mm , length 640 mm or equivalent
Ø 2.0 mm , length 450 mm or equivalent
Probe covers for each probe
Sterilization Methods ETO or autoclave
Original Trolley
Medical Compressor Optional

OR

Electro kinetic Intracorporeal Lithotripsy System

Highest security for tissue with short stroke
Precise working through low-vibration hand piece
Single and continuous pulses controlled by footswitch Handle with Integrated rod
Autoclavable: self-contained unit handle/rod
Low-vibration: secure and sensitive handling possible
Handles with 3 different integrated rods
3 intensities, microprocessor controlled 250, 500 and 950 mJ selectable
Centered micro spark plasmas to keep distances to the tissue and facilitate targeting
Endoscope protection through rounded edges at the tip of the probe
No breaking problem compared to laser fiber
Electrical foot pedal
Power supply cable

Electro kinetic Hand piece kit
Standard Probe of 5 different sizes
Highly flexible probes but keep their position
Precisely worked probe tip for reproduceable shock waves
Original Trolley

OR

Ultrasonic Intracorporeal Lithotripsy System

A Powerful Solution with its unique microcontroller-based algorithm
sophisticated design that transmits more energy to the probe
The system can also fragment and aspirate stones simultaneously
Plug-and-play system that saves time
Self-calibrate within a few seconds before beginning a procedure
Variety of semi-flexible and rigid probes
Single-piece design creates a larger suction channel
Connector prevents probes from bending during a procedure
Dual-Function Footswitch to fragment
hard and soft stones using side-by-side
Standard Probe of 5 different sizes
Cleaning rod
Power cord
Original Trolley

Accessories:
Nil

Optional (if any):
Nil

Clinical Specialty	Urology
Generic Name	**INTRACORPOREAL LITHOTRIPTER (COMBINE UNIT OF TWO ENERGIES I.E., PNEUMATIC, ULTRASONIC)**
Clinical Purpose	It is used for fragmentation of urinary stones; the combine unit gives more power

TECHNICAL SPECIFICATIONS

Consisting Of:
Dual foot pedal, Compressed air connection, Pneumatic hand piece, ultrasound hand pieces stone catcher and a selection of a Pneumatic and Ultrasound, Probes

Technical specification of Pneumatic Lithotripter

Pneumatic + Ultrasound

1 x Main control unit including:
1 x holder for stone fragment catcher 1 x Electric foot pedal:
1 x Spare tube for the pneumatic hand piece without connector 1 x spare fuses
1 x stone catcher Autoclavable, reusable:
1 x Ultrasound hand piece set:
1 x Pneumatic hand piece set including:
20 x pneumatic probes: (5 each or End user to specify)
5 x Probe, 2.0 mm, length 425 mm:
5 x Probe, 1.0 mm, length 605 mm:
5 x Probe, 0.8 mm, length 605 mm:
5 x Pneumatic probe 1.0 mm, length 570 mm:
20 x Ultrasound probes, Ø 3.3 x 403 mm:
1 x Vacuum/Suction set incl.:
1 x Suction/vacuum System body:
1 x Suction set for Suction/vacuum System (silicone tubing with 2 connecting pieces): 1 x Suction/vacuum System tube set including:
1 x Suction tube for Suction/vacuum System, Ø 4.0 mm, length 353 mm (to be combined with pneumatic probe):
1 x Suction tube for Suction/vacuum System, Ø 3.5 mm, length 380 mm: 1 x Length adapted pneumatic probe, Ø 1.6 mm, length 453 mm
1 x Suction tube for Suction/vacuum System, Ø 1.6 mm, length 595 mm: 1 x Length adapted pneumatic probe, Ø 0.8 mm, length 668 mm.
1 x roller clamp (set of 2) for adjustment of suction flow in connection. 1 x Compressed air tube 3.0 m for the compressor:
1 x main cord Europe for power supply:
1x Intra corporeal lithotripter pump 1 x Medical Air Compressor
1 x Imported Cart
1 x Double reusable suction jar set of 2 jars with equal capacity
Shock Pulse Handpiece Double Paddle Footswitch Nose Cone
Cleaning Stylet Small & Large Probe Wrench

Generator Specifications:
Voltage: 90–264 VAC Frequency: 50/60 Hz
Electro-medical: Class I, Type BF Frequency: 19,500 Hz - 21,500

Transducer with Nose Cone Diameter: 2 in (4.8 cm) Length: 7.7 in (19.6 cm) Weight: 0.99 lbs (0.45 kg) Cable Length: 10 ft (3 m) Validated Lifetime: 100 Reuses Integrated probes of both ultrasonic + high frequency bursts of mechanical wave energies to delivered simultaneously from a single probe with suction control Lithotripsy Probes Set Reusable: 3 different sizes
Accessories: Nil
Optional (if any): Nil
Note: The variation in specifications according to the type of source quoted by the bidders will be acceptable as per respective manufacturer standard specifications.

Clinical Specialty	Urology
Generic Name	**PCNL SET (ADULT)**
Clinical Purpose	Percutaneous nephrolithotomy (PCNL) is a minimally-invasive procedure to remove stones from the kidney by a small puncture wound (up to about 1 cm) through the skin. It is most suitable to remove stones of more than 2 cm in size and which are present near the pelvic region. It is usually done under general anesthesia or spinal anesthesia.
TECHNICAL SPECIFICATIONS	
Percutaneous Nephroscope Set for Adult PCNL Set Broad View Telescope with Parallel eye piece, 0/6/12/20/25/30 Deg. With compatible Instrument channel and instruments Sealing cap Sheath 20FR to 27 FR. Or better, automatic locking mechanism distal tip straight, with swiveling irrigation connector Obturator Hollow Telescope dilator 9-27 Fr. Consisting of: 1 hollow guide rod 6 Fr. And telescope Dilator 30 Fr. Compatible Stone grasping forceps, and Two / Three-pronged stone grasper Compatible suction irrigation pump **Camera as per end user choice defined separately in PVMS Urology**	
Accessories: PCNL needle Set of Teflon dilator	
Optional (If Any): Nil	

Clinical Specialty	Urology
Generic Name	**MINI PCNL**
Clinical Purpose	Percutaneous nephrolithotomy (PCNL) is a minimally-invasive procedure to remove stones from the kidney by a small puncture wound (up to about 1 cm) through the skin. It is most suitable to remove stones of more than 2 cm in size and which are present near the pelvic region. It is usually done under general anesthesia or spinal Anesthesia.
TECHNICAL SPECIFICATIONS	
Mini PCNL Consist of telescope 7-12 degree or better eye piece Operating Sheath Size 7.5 to 12 Fr or better instrument channel 6.5 to 7.5 fr for instrument and irrigation for mini Nephroscope Continuous irrigation Nephroscope Sheaths 11-21 Fr Minimum 3 sizes operating sheath 14-21 with Dilators compatible with the Nephroscope and all accessories stone grasping forceps, 2 / 3 prong stone grasper grasping forceps with alligator Jaw Compatible suction irrigation pump **Camera as per end user choice defined separately in PVMS Urology**	
Accessories Nil	
Optional (If Any) Nil	

Clinical Specialty	Urology
Generic Name	**MICRO PCNL**
Clinical Purpose	This is further miniaturization of Mini PCNL.
TECHNICAL SPECIFICATIONS	
Micro PCNL SET Semi rigid optic/Telescope modular PCNL 10,000 pixel / 120° Optic shifter Micro PCNL Sheath 7.8 Fr or less Pump for grasping stone Sterilization Container Compatible suction irrigation pump **Camera as per end user choice defined separately in PVMS Urology**	
Accessories: • Standard sets of reusable instruments.	
Optional (If Any): Nil	

Clinical Specialty	Urology
Generic Name	**HOLMIUM: YAG MEDICAL LASER 30 - 35 WATT.**
Clinical Purpose	Used for stone and strictures.

TECHNICAL SPECIFICATIONS

- Tower/ Desktop type
- **Laser source** Ho: YAG Wave lengths 2.1micron
- **Energy per pulse** 3 or better joules.
- **Frequency/Repetition rate** 5-25 hertz or better
- **Aiming beam** Green 500-550nm(adjustable),3R.
- **User Interface:** Touch screen or better.
- **Fiber Detection**: Without RFID (open System)
- **Electrical requirements**. 110-230 VAC, single phase; 50/60 Hz
- **Cooling system:** Air-cooled/ Integrated cooling (Water to heat exchanger)
- **Activation:** Footswitch

Accessories:

- Laser fiber striper and cutter. Qty-10 each
- Footswitch
- Laser Safety Glasses Qty-5
- Online ups with the backup of up to 10-15min.
- Over 15 times reusable laser fiber, length 3 m, optical core 200-272 µm,365 - 400µm, 550-800 µm. QTY – 5 of each type.

Optional (if any):

Nil

Clinical Specialty	Urology
Generic Name	**HOLMIUM: YAG MEDICAL LASER 50 - 90 WATT**
Clinical Purpose	Holmium is well absorbed in water, highly effective in the fragmentation of calculi and ablation of hard tissue, it also provides an excellent hemostasis in soft tissue surgery.

TECHNICAL SPECIFICATIONS

Average Power: 50 watt to 90watt (depends upon quoted power)

Tower type

Laser source Ho: YAG Wave lengths 2.1micron

Energy per pulse up to 4.5 joules or better.

Frequency/Repetition rate 5-30 hertz or better

Aiming beam Green (adjustable) ,500-550nm, 3R, Continuous or blinking mode.

Display 7 inch or better

User Interface: Touch screen.

Fiber Detection: Without RFID (open System)

Electrical requirements. 110-230 VAC, single phase/ 3 Phase; 50/60 Hz

Cooling System: Integrated cooling (Self-contained water to air heat exchanger)

Activation: Footswitch

ACCESSORIES:

- Laser fiber striper and cutter Qty-10 each
- Laser Safety Glasses Qty-3
- Online ups with the backup of up to 10 min on full load
- Footswitch
- Over 15 times reusable laser fiber, length 3 m, optical core 200-272 µm, 365 - 400µm, 550-800 µm. QTY – 5 of each type.
- Protective Case/Cover for Laser Machine

OPTIONAL (IF ANY):

Nil

Clinical Specialty	Urology
Generic Name	**HOLMIUM: YAG MEDICAL LASER 100 - 130 WATT.**
Clinical Purpose	Holmium is well absorbed in water, highly effective in the fragmentation of calculi and ablation of hard tissue, it also provides an excellent hemostasis in soft tissue surgery.

TECHNICAL SPECIFICATIONS:

Tower type
Average Power: 100 watt to 130watt (depends upon quoted power)
Laser source: Ho: YAG Wave lengths 2.1micron
Energy per pulse: 2- 4.5 joules or better.
Frequency/Repetition rate: up to 60 hertz or better
Aiming beam: Green diode 500-550nm, 3R, Continuous or blinking mode.
Display: 8 inch or better
User Interface: Touch screen or tap button with lcd .
Fiber Detection: Without RFID (open System)
Electrical requirements: 110-230 VAC, single phase or 3 phase ; 50/60 Hz
Cooling System: Integrated cooling, (Self-contained water to air heat exchanger)
Activation: Footswitch

ACCESSORIES:

- Laser fiber striper and cutter Qty-10 each
- Laser Safety Glasses Qty-3
- Online ups with the backup of up to 10 min on full load
- Footswitch
- Over 15 times reusable laser fiber, length 3 m, optical core 200-272 µm, 365 - 400µm, 550-800 µm. QTY – 5 of each type.
- Protective Case/Cover for Laser Machine

OPTIONAL (IF ANY):

- Morcellator (as per PVMS specifications)

Clinical Specialty	Urology
Generic Name	**HOLMIUM: YAG MEDICAL LASER 140 WATT AND ABOVE.**
Clinical Purpose	Holmium is well absorbed in water, highly effective in the fragmentation of calculi and ablation of hard tissue, it also provides an excellent hemostasis in soft tissue surgery.

TECHNICAL SPECIFICATIONS

Tower type

Average Power: 140watt and onwards (depends upon quoted power)

Laser source: Ho: YAG Wave lengths 2.1micron

Energy per pulse: 2- 5 joules or better.

Frequency/Repetition rate: up to 100 hertz or better

Aiming beam: Green diode 500-550nm, 3R, Continuous or blinking mode.

Display: 8-inch LCD or better

User Interface: Touch screen.

Electrical requirements: 110-230 VAC, single phase or 3 phase ; 50/60 Hz

Cooling System: Integrated cooling, (Self-contained water to air heat exchanger) **Activation** : Footswitch

ACCESSORIES:

- Laser fiber striper and cutter Qty-10 each
- Laser Safety Glasses Qty-3
- Online ups with the backup of upto 10 min on full load
- Footswitch
- Over 15 times reusable laser fiber, length 3 m, optical core 200-272 µm,365 - 400µm, 550-800 µm. QTY – 5 of each type.
- Protective Case/Cover for Laser Machine

OPTIONAL (IF ANY):

- Morcellator (as per PVMS specifications)

Clinical Specialty	Urology
Generic Name	**DIODE LASER 150- OR ABOVE**
Clinical Purpose	Used for vaporization of prostate, Palliative, curative treatment of malignant and Benign tumors, especially of benign prostate Enlargement Surgical tissue preparations such as resection, Extirpation, ablation and coagulation

TECHNICAL SPECIFICATIONS

Wavelength: 980nm
Peak energy at fiber tip: 150 W or above
Peak energy at fiber tip pulsed: 20 W or better.
Pulse interval: 250 µs – 5s or better
Aiming beam: 632 nm adjustable in 3 intensity levels.
Warning Signal: Optical
Acoustical: Volume Adjustable or other
Dose mode: variable by time, applied energy or pulses
Emission Mode: Continuous (CW) Pulse (PM) single (SM), Quasi Continuous (QCW).
Fiber Detection: Without RFID (open System)
Memory Function: Programmable hot memory keys for storage of treatment parameters
User Interface: Color Touch Screen
Laser cooling system: Air Cooled/ water cooled

Accessories:

- Laser fiber striper and cutter Qty-10 each
- Laser Safety Glasses Qty-3
- Over 10-time Reusable fiber with ball, flat, twister tip (sterile) 10 Pieces each
- Foot pedal
- Online ups with 10 min Back up

Optional (if any):
Nil

Clinical Specialty	**UROLOGY**
Generic Name	**ELECTRONIC OPERATING TABLE FOR UROLOGY**
Clinical Purpose	Operating Tables used to conduct the different kind of surgical interventions of patients, the dedicated tables provide all the positions required by the surgeon.

TECHNICAL SPECIFICATIONS

Table top (Radiolucent) with antistatic mattress, 5-6 sections and equipped with X-ray cassette holder. Sturdy table for minimum patient weight of 450 Kg or better in normal position. Table must be compatible to be connected with C-ARM and fully radiolucent

TABLE TOP IS ARRANGED AS:

- Head plate
- Back plate
- Seat plate
- Two separate let plates
- Base of the table stainless steel/ABS cover, 4 swivel castors
- Sliding table top up to 300mm or better

MOVEMENT (Remote Controlled):

- Up and down movement height range: **700-1000 mm**
- Trendelenburg/Reverse Trendelenburg -30° / 30°
- Lateral tilt 20° / - 20° or better
- Back plate: up **70° – 90° / Down 40° – 50°**
- Leg plate: **up 18° / Down 90°**
- Kidney bridge position
- Operating Voltage: 220V, 50Hz with battery backup
- Electric / Manual override in case of electric supply failure *(Procuring agency to specify)*

Note:

In case of battery backup, firm will be responsible for replacement of batteries free of cost for 05 years

STANDARD ACCESSORIES:

- Arm rest with clamp
- Fixation strap
- Anesthesia screen
- Adjustable bottle holder rod
- Shoulder support
- U Shape head rest for general surgery
- Flex, Reflex
- Knee crutches with pads
- Liquid basin
- Gel Pad
- Accessories trolley

Any other accessory to be defined by the end-user

Clinical Specialty	Urology
Generic Name	**URODYNAMIC SYSTEM**
Clinical Purpose	Urodynamic testing or Urodynamic is a study that assesses how the bladder and urethra are performing their job of storing and releasing urine.

TECHNICAL SPECIFICATIONS

Wired / Wireless Video Urodynamic System should be able to perform following
Cystormetry
Uroflowmetry
Pressure Flow Studies
Uretheral Pressure Profile
Video Urodynamic
EMG

SYSTEM CONTENT

Main Module with 3 each Pressure Channel or more
Wired / Wireless USB Module
Wired / Wireless Uroflow Transducer
Wired / Wireless Peristaltic Pump
Wired / Wireless EMG
Wired / Wireless Remote Controller
Standard Software CD
Urine Beaker 05
Funnel 02
Starter Kit Disposable
(i) Pump Tubing 10
(ii) Measuring Tubing 10
(iii) EMG Electrode 10
(iv) Disposable Pressure Transducer 10
(v) Cystometery Double Lumen Catheter 30
(vi) Rectal Double Lumen Catheter 30
Basic Urology Table for Investigation
Wired / Wireless UPP Puller
Video Urodynamic
Urination Chair

ACCESSORIES:

- Laser Jet Color Printer
- Computer with monitor Core i7, Ram 8 GB, Hard Drive 1 TB
- Accessories with EMG

OPTIONAL (IF ANY):

- DICOM

Clinical Specialty	Urology
Generic Name	**EXTRACORPOREAL SHOCKWAVE LITHOTRIPTER INTEGRATED TYPE**
Clinical Purpose	Extracorporeal shockwave lithotripsy (ESWL) is a non-invasive treatment of kidney stones and biliary calculi (stones in the gallbladder or in the liver) using an acoustic pulse. It is also reported to be used for salivary stones and pancreatic stones

TECHNICAL SPECIFICATIONS

Shockwave Lithotripter will be a complete dedicated integrated system; capable of treating the urinary stones with other special urological applications by using outline / inline/ free line localization system of Ultrasound and X-Ray. It can also be used for diagnostic purposes; the system should be top of the line and latest. The detail of system configuration is as under **SHOCKWAVE SYSTEM:**

Type Shockwave generator: Electromagnetic
No. of Shockwave System: One
Triggering Method: Auto & Manual
Selection of Energy Variable
Energy Density minimum 0.4 mJ/mm² or better
Energy Density Maximum 2.5mj/mm² or more
Penetration depth of waves: Min. 170mm or more
Focal Pressure: 73 Mpa or better
Rate of Shockwaves: Variable up to 120 / minute or more
Water system: Closed loop, integrated (fixed)
Control: Both through main console and remote via touch screen monitor

IMAGING / LOCALIZATION

Modes: X-Ray and Ultrasound
Localization system Inline /freeline localization/Outline
Automatic Stone positioning

a) X-Rays Image Intensifier / FPD

Type: Integrated isocentric C-arm
X-ray Generator: High Frequency inverter type
Output power generator 15KW or more
Size of I.I / FPD: 23cm / 21x21cm
Pickup Tube CCD /FPD
Continuous Fluoroscopy 12.5MA or more
Pulsed Fluoroscope up to 100MA or better
Digital Radiography KV 40 – 120KV
Digital Radiography MA 100MA or more
Automatic KV and MA control for optimal image quality.
X-ray tube focal Spot Dual 0.3 / 0.6 mm Anode
Heat Storage capacity 300KHU or more
Memory: LIH
Monitor: 43cm or more

b) Ultrasound

Type: Trolley Mounted
Transducer: Multi frequency, Convex 3.5MHz (I.O to specify)

Resolution	256 gray levels
Monitor Size	30 cm or more
Depth	24cm

DIANOSTIIC X-RAY:

The X-ray system will be used for fluoroscopy. The radiation protection measures / accessories must be provided with the system.

LCD Medical Grade (Dual) 46 cm or more

X-Ray, Ultrasound and stone phantoms for calibration

PROCEDURE TABLE: -

Type: Integrated special motorized table

Height: Adjustable

Movements: Four-way movements Patients positioning: Automatic

Table top: Radio translucent

Complete with relevant accessories. Lead Aprons (Size and Qty. I.O to Specify) Suitable for Litho & Endo urological and diagnostic procedure.

Tiltable, Complete with leg holders and douche tray.

OPERATING CONSOLE:

Control:

Control of all functions must be available at the operating console & on table. Data storage and analysis:

The data will be stored in the main computer system or on separate PC through dedicated software

MOD / CD /DVD writing system or USB recording

Communication Software: DICOM-3

Computable UPS must provide with the supplied machine

POWER REQUIREMENT: -

Voltage: Three phase / one phase, 50Hz

Site Preparation

Bidder Will be responsible for arrangement of all installation requirements, console, Electric DB, Cable trays / trench, lead shielding, UPS Installation for room finishing / preparation.

Accessories:

Nil

Optional (if any):

Nil

Note:

The variation in specifications according to the type of source quoted by the bidders will be acceptable as per respective manufacturer standard specifications.

Clinical Specialty	Urology
Generic Name	**EXTRACORPOREAL SHOCKWAVE LITHOTRIPTER MODULAR TYPE/MOBILE UNIT**
Clinical Purpose	Extracorporeal shock wave lithotripsy is a non-invasive treatment of kidney stones and biliary calculi using an acoustic pulse. It is also reported to be used for salivary stones and pancreatic stones

TECHNICAL SPECIFICATIONS

Shockwave Lithotripter will be a Modular system; capable of treating the urinary stones with other special urological applications by using outline/ inline/free line localization system of Ultrasound and X-Ray. It can also be used for diagnostic purposes. The system should be top of the line and latest. The detail of system configuration is as under:

Shockwave generator	Electromagnetic
No. of Shockwave System:	One
Triggering Method:	Auto & Manual
Selection of Energy	Variable
Energy Density	Min 0.88mJ/mm² or better
Penetration depth of waves:	Min. 120mm
Focal Distance;	Min 140mm or better
Focal spot size:	70mm² or better
Pressure at Focus;	Min 50MPa
Rate of Shockwaves:	Variable up to 120 / minute or more
Water system:	Closed loop, integrated
Control:	Main console / remote *(Procuring agency to specify)*
IMAGING / LOCALIZATION	
Modes:	X-Ray and Ultrasound
Localization system	Inline /free line localization/Outline
a) X-Rays Image Intensifier	
Type:	Integrated isocentric C-arm
X-ray Generator:	High Frequency inverter type Output
power generator	2 KW or more
Size of I.I:	23cm
Pickup Tube	CCD
Fluoroscopy	Min.3.0 mA and 120 kV
X-ray tube focal Spot	Dual 0.3 to 1.5mm Anode
(any two focal spots in between the given range)	
Heat Storage capacity	40KHU or more
Memory:	LIH
Monitor:	43cm or more
b) Ultrasound	
Type:	Trolley Mounted
Transducer:	Multi frequency, Convex 3.5Mhz (I.O to specify)
Resolution	256 gray levels
Monitor Size:	30 cm/ more
Depth	24cm

DIANOSTIIC X-RAY:

The X-ray system will be used for fluoroscopy. The radiation protection measures / accessories must be provided with the system.

PROCEDURE TABLE: -

Special motorized table suitable for litho & Endo urological and diagnostic procedure Tilt able and Complete with leg holders and douche tray

Height	Adjustable
Weight Bearing Capacity	Min 180 Kg
Movements:	Four way movements
Patients positing	Automatic / Manual
Table top:	Radio translucent

Complete with relevant accessories. Lead Aprons (I.O to specify size and quantity)

OPERATING CONSOLE:

Control:

Control of all functions must be available at the operating console.

Data storage and analysis:

The data will be stored in the main computer system or on separate PC through dedicated software MOD / CD /DVD writing system or USB recording (In case of separate PC, the system must be supplied by the manufacturer of Lithotripter)

Communication Software:

DICOM-3

POWER REQUIREMENT: -

Voltage: Three / Single phase, 50Hz

Site Preparation

Bidder Will be responsible for arrangement of all installation requirements, console, Electric DB, Cable trays / trench, lead shielding, UPS Installation for room finishing / preparation.

Accessories:

Nil

Optional (if any):

Nil

Note:

The variation in specifications according to the type of source quoted by the bidders will be acceptable as per respective manufacturer standard specifications.

Clinical Specialty	Urology
Generic Name	**GENERAL /PEDIATRIC SURGERY SET**
Clinical Purpose	Pediatric urology concerns urologic disorders in children Such disorders include cryptorchidism (undescended testes), congenital abnormalities of the Genitourinary tract, enuresis, underdeveloped genitalia (due to delayed growth or delayed puberty, often an endocrinological problem), and vesicoureteral reflux.

TECHNICAL SPECIFICATIONS

NOTE:

- *Minor variation in sizes shall not be made reason for rejection*
- *Procuring agency to select the items and quantity of instruments / retractors from the list mentioned below*

CONSISTING OF:

- BABCOCK TISSUE FORCEPS 155MM BABCOCK TISSUE FORCEPS 155MM BABCOCK TISSUE FORCEPS175MM BABCOCK TISSUE FORCEPS 215MM BENSON PYLORUS SPREADER 155MM PAYR INTESTINAL CLAMP 180MM. PAYR INTESTINAL CLAMP 200MM PAYR INTESTINAL CLAMP 275MM
- PROBE DOUB.ENDED D:3MM W/HOLE 190MM DBL-ENDED PROBE MALL 3.5MM EYES 250MM POOL SUCTION CANNULA CHARR.21
- POOL SUCTION CANNULA CHARR.30 BABY-ROUX
- RETRACTOR
- BOOK WALTER RETRACTOR OMNITRACK THOMSON RETRACTOR
- MERCEDES BELFOUR
- RETRACTOR
- LONE STAR AYUVARD
- WEIGHTED VAGINAL SPECULUM
- RING RETRACTORS
- RETRACTOR 135MM
- LANGENBECK RETRACTOR SOLID 30 X 10MM 229MM LANGENBECK RETRACTOR SOLID 40 X 10MM 230MM LANGENBECK RETRACTOR SOLID 43 X 13MM 229MM DEAVER RETRACTOR FIG 00 22MM 215MM DEAVER RETRACTOR FIG 1 25MM300MM
- RIBBON RETRACTOR MALL 330X30MM RIBBON RETRACTOR MALL 330X40MM RIBBON RETRACTOR MALL 330X50MM BECKMANN-ADSON RETR 4X4 SHARP 310MM ADSON LAMIN RETR 5X4 SEMI-S 325MM BALFOUR-BABY ABDOMINAL RETRACTOR
- BALFOUR ABDOMINAL RETRACTOR 155X200MM MICRO FORCEPS DE'BAKEY 1MM STR.185MM MICRO FORCEPS DE'BAKEY 1MM STR.210MM MICRO FORCEPS DE'BAKEY 1MM STR.185MM MICRO-ADSON FORCEPS SERR 120MM
- HAIGHT RIB SPREADER 30X30MM-BLDS
- RIB SPREADER FINOCHIETTO-HAIGHT ALUMI. FINOCHIETTO RIB SPRDR ALUM 31X45 BLDS FRAZIER SUCTLUER-HUB9FR102MMWRK-LGTH FRAZIER
- SUCTLUER-HUB15FR5/102MM LGTH DESMARRES RETRACTOR 12X16MM 140MM DESMARRES RETRACTOR 13X18MM 140MM
- STERILIZATION CONTAINER SYSTEM COMPLETE SET Consisting of:
- BOTTOM FOR 1/1 CONTAINER HEIGHT:120MM PRIMELINE 1/1 LID RED

- SILICONE PAD 470X230X30MM
- 1/1 SIZE PERF BASKET 540X253X76MM
- PEADS CYSTOURETHROSCOPE 8FR, 6, 1 STEP, 8TO11FR AUTOCLAVABLE WITH CONTAINER AND ACCESSORIES FORCEPS
- HOOK ELECTRODE BALL ELECTRODE KNIFE
- INJECTION NEEDLE

VASCULAR BASIC SET

- FOERSTER SPONGE FCPS SERR STR 245MM BACKHAUS TOWEL CLAMP 110MM KIDNEY TRAY STAINLESS STEEL 250MM LABORATORY DISH 0.16 L
- SCALPEL HANDLE #3 125MM SCALPEL HANDLE #4 135MM
- METZENBAUM SCISSORS CVD 145MM METZENBAUM SCISSORS CVD 200MM MAYO SCISSORS CVD 170MM SURGICAL SCISSORSSTR S/B145MM
- POTTS-DE MARTEL SCISSORS 25DGS/S185MM POTTS-DE MARTEL SCISSORS45DGS/S185MM POTTS-DE MARTEL SCISSORS60DGS/S185MM TOENNIS-ADSON SCISS X-DEL CVD 175MM DE'BAKEY ATR.FCPS 2.0MM STR150MM DE'BAKEY ATR.FCPS 2.0MM STR 200MM STANDARD TISSUE FORCEPS 1X2 145MM STANDARD TISSUE FORCEPS 1X2T 200MM CUSHING DEL STR FORCEPS 200MM
- HALSTED-MOSQUITO FORCEPS DELSTR125MM HALSTED-MOSQUITO FORCEPS DEL CVD125MM CRILE FORCEPS STR 140MM
- CRILE FORCEPS CVD 140MM ROCHESTER-PEAN FORCEPS STR 200MM
- ROCHESTER-PEAN FORCEPS CVD 200MM KOCHER-OCHSNER FORCEPS STR 1X2 160MM KOCHER-OCHSNER FORCEPS STR 1X2 200MM DE'BAKEY ATR.BULLDOGCLAMP CVD.20/78MM DE'BAKEY ATR.BULLDOGCLAMP STR.30/90MM DE'BAKEY ATR.BULLDOGCLAMP CVD.30/86MM DE'BAKEY ATR.BULLDOGCLAMP CVD.45/97MM DE'BAKEY-BAINBRIDGE ATR.FCPS STR180MM DE'BAKEY-BAINBRIDGE ATR.FCPS CVD 180MM DE'BAKEY ATR.MOSQUITO FCPS STR165MM DE'BAKEY ATR.MOSQUITO FCPS CVD165MM PEAN-DE'BAKEY ATR.FRCPS STR155MM
- PEAN-DE'BAKEY ATR.FRCPCVD 155.MM
- DE'BAKEY ATR.COARCTAT. CLMPSTR65/225MM DE'BAKEY PERIPHERAL CLAMP 60DG180MM DE'BAKEY BULLDOG CLAMPRING-HDL45DEG125MM DE'BAKEY COARCTAT FCPSANG15DEG50/165MM BABY-SATINSKY CLAMP150MM
- SATINSKY CLAMP265MM
- SATINSKY CLAMP HVY-CVD SM265MM DERRA PEDIATRIC FORCEPS 26MM175MM
- COOLEY PEDIATRIC CLAMP 60DG 30/160MM
- BABY-MIXTER FORCEPS HEAVY-CVD180MM OVERHOLT FORCEPS # 1 CVD209MM
- BABY-MIXTER FORCEPS CVD 140MM ALLIS ATR.FORCEPS 6.2MM 155MM DIRECTOR W/TONGUE STR 145MM DOUBLE-ENDED PROBE 1.5MM 145MM DAVIS VASCULAR SPATULA 245MM SCHMIDT DISSECTOR BLUNT 235MM DE'BAKEY DILATOR MALL 1.0MM 190MM DE'BAKEY DILATOR MALL 1.5MM 190MM DE'BAKEY DILATOR MALL 2.0MM 190MM DE'BAKEY DILATOR MALL 2.5MM 190MM DE'BAKEY DILATOR MALL 3.0MM 190MM DE'BAKEY DILATOR MALL 3.5MM 190MM DE'BAKEY DILATOR MALL 4.0MM 190MM DE'BAKEY DILATOR MALL 4.5MM 190MM DE'BAKEY DILATOR MALL 5.0MM 190MM PELKMANN FORCEPS CVD SERR261MM
- CUSHING VEIN RETRACTOR 10X13MM 203MM
- SENN-MILLER RECTOR.SH.8X7/18X5.5MM FARABEUF RTRCTRS23X16/28X16-20X16/24X16 VOLKMANN RETR4-PRGSEMI-S8.5X19222MM KOCHER-LANGENBECK RETR 41X11MM216MM CRILE VESSEL HOOK BLUNT 90DEG 6/200MM ADSON-BABY RETRACTOR 3X4 BLUNT140MM

ADSON LAMIN RETR 5X4 SEMI-S 325MM SCHMID IRRIGATING CANNULA MALLEAB.LL. SCHMID IRRIGATING CANNULA MALLEAB.LL. HALSEY NEEDLE HOLDER DEL SERR130MM CRILE-WOOD NDLHLDRFINE-SERR 150MM MAYO-HEGAR NEEDLE HOLDER 200MM

- TC RYDER NEEDLE HOLDERX-DELSERR155MM LAHEY FORCEPS LONG-SERR 224MM
- LAHEY DISS.A. LIGAT.FORCEPS 230MM UNIVERSAL TROCAR WITH 4 TIPS
- THORACIC RETRACTOR (MERCEDES-RETRACTOR) CONSISTING OF: RETRACTOR ONLY
- PAIR OF BLADES SMALL 42X65MM PAIR OF BLADES LARGE 75X75MM
- STERILIZATION CONTAINER SYSTEM COMPLETE SET Consisting of: BOTTOM FOR 1/1 CONTAINER HEIGHT:120MM
- PRIMELINE 1/1 LID RED SILICONE PAD 470X230X30MM
- 1/1 SIZE PERF BASKET 540X253X76MM

KIDNEY INSTRUMENTS SET

- FOERSTER SPONGE HOLD.FORC., SERRAT.JAWS
- MAIER SPONGE FORCEPS W/RATCH.CVD.262MM BACKHAUS TOWEL HOLDING FORCEPS,110MM SCALPEL HDL.NO.3
- SCALPEL HANDLE NO.3L SCALPEL HDL.NO.4
- OP. SCISSORS, STR., BL/SH,145MM MAYO SCISSORS STR 170MM
- MAYO DISSECT.SCISSORS CVD.170MM MAYO-HARRINGTON SCISSORS STR 230MM
- MAYO HARRINGTON DISSECT.SCISSORS CVD.230 METZENBAUM SCISSORS STR 145MM METZENBAUM DISSECT.SCISSORS CVD.145MM METZENBAUM SCISSORS STR 200MM METZENBAUM DISSECT.SCISSORS CVD.200MM NELSON-METZENBAUM SCISSORS STR 250MM NELSON-METZENBAUM SCISSORS CVD 253MM POTTS-SMITH VESSEL SCISSORS 60DG 175MM POTTS-DEMARTEL SCISSORS 60DG 220MM JOSEPH SCISSORS STR S/S 150MM
- JOSEPH SCISSORS CVD S/S 150MM CUSHING DISSECT.FORCEPS STR.200MM DISSECT.FORCEPS W/O T.STD.PATT.200MM TISSUE FORCEPS, STD.PATT.,1X2 T.,145MM WAUGH DISSECT.FORCEPS 1X2T.200MM WAUGH DISSECT.FORCEPS 1X2T.250MM ALLIS INTESTINAL FORCEPS DELIC.PATT.
- ALLIS ATRAUMATIC FORCEPS 8,4MM 255MM ATRAUMATIC OVUM FORCEPS STR SM250MM HALSTED-MOSQUITO FORCEPS DELSTR125MM HALSTED MOSQUITO FORCEPS, CURVED,125MM CRILE FORCEPS CVD 140MM
- CRILE ARTERY FORCEPS STR.140MM ROCHESTER-PEAN FORCEPS STR 185MM
- ROCHESTER-PEAN ARTERY FORCEPS CVD.185MM HALSTED-MOSQUITO FORCEPS DELSTR200MM HALSTEAD MOSQ.ARTERY FORCEPS CVD.200MM CRAFOORD ARTERY FORCEPS CVD.245MM KOCHER-OCHSNER
- FORCEPS STR 1X2240MM KOCHER-OCHSNER FORCEPS CVD 1X2240.MM MIKULICZ PERITONEUM FORCEPS CVD.205MM BABY-MIXTER FORCEPS HEAVY-CVD180MM OVERHOLT-GEISS SUTURE FCPS#3CVD276MM MIXTER SUTURE FORCEPS RT-ANG 230MM
- CRILE-WOOD NEEDLE HOLDER 150MM HEGAR-MAYO NEEDLE HOLDER 200MM JAMESON NEEDLE HOLDER DEL SERR 230MM
- MASSON NEEDLE HOLDER 265MM
- WANGENSTEEN NEEDLE HOLDER 275MM DESCHAMPS NDLF/RT-HNDBLTLNG-HK215MM DIRECTOR W/TONGUE STR 145MM
- DOUBLE-ENDED PROBE 1.5MM 200MM VOLKMANN RETR4-PRGSEMI-S8.5X19222MM KOCHER RETRACTOR 60X25MM
- RICHARDSON RETRACTOR OPEN 37X37MM 242MM KELLY RETRACTOR 150 X 39MM
- DOYEN RETRACTOR 90X45MM 242MM DOYEN RETRACTOR 60X60MM 242MM DOYEN

RETRACTOR 90X60MM 242MM DOYEN RETRACTOR 120X60MM 242MM

- FRITSCH RETRACTOR #4OPEN 46X75MM 242MM DEAVER RETRACTOR FIG 2 25MM 318MM HARNGTN LNG SPATULAFLX 123X64MM 299MM CUSHING VESS. HOOK BLNT 90DG 6MM/279MM CUSHING VEIN RETRACTOR 10X13MM 203MM GLOVER ATRAUMATIC CLAMP CVD 215MM GLOVER ATRAUMATIC CLAMP CVD 220MM DBAKY TNGENTIAL CLMP 4.58MM-WIDE270MM DEBAKEY TANGENTIAL CLMP 5 75MM-W280MM GLOVER MINI-BULLDOG22/52MM
- DEBAKEY ATRAUMATA AORTA CRSS-CLMP240MM DEBAKEY CLAMP 90DG 55/85MM 210MM DEBAKEY CLAMP 60DG 40/93MM 240MM
- GUYON ATR.KIDNEY PED.CLAMP 230MM GUYON ATRAUMATIC KIDNEY CLAMP230MM SCHMIDT DISSECTOR BLUNT 235MM VASCULAR SPATULA230MM
- KIDNEY TRAY STAINLESS STEEL 250MM LABORATORY DISH 0.16 L
- LAHEY/SWEET GALL DUCT FORCEPS 200MM LAHEY FORCEPS LONG-SERR 224MM
- LAHEY DISS.A. LIGAT.FORCEPS 230MM UNIVERSAL TROCAR WITH 4 TIPS
- THORACIC RETRACTOR (MERCEDES-RETRACTOR) CONSISTING of: RETRACTOR ONLY
- PAIR OF BLADES SMALL 42X65MM PAIR OF BLADES LARGE 75X75MM DOYEN INTESTINAL CLAMP STR165MM DOYEN INTESTINAL CLAMP CVD165MM
- HARTMANN INTESTINAL CLAMP STR200MM HARTMANN INTESTINAL CLAMP CVD200MM BIPOLAR CABLE 3.5MM LENGTH
- DUROGRIP NDL HLDR SERR 0.2/180MM DUROGRIP CASTROV.NDL HLDR SERR 0.2/215MM
- BONE CURETTE DBEND 210MM
- ST MARK PELVIS CLAMP 35X45/124X60MM292MM ST MARK PELVIS CLAMP 60X45/174X60MM 333MM ST MARK PELVIS CLAMP 60X45/178X60MM 333MM INSTRUMENTS TROLLEY (IMPORTED)
- SURGICAL DRUM BASIN STAND SMALL BASIN STAND MEDIUM BASIN STAND LARGE
- STERILIZATION CONTAINER SYSTEM COMPLETE SET Consisting of: BOTTOM FOR 1/1 CONTAINER HEIGHT:120MM
- PRIMELINE 1/1 LID RED SILICONE PAD 470X230X30MM
- 1/1 SIZE PERF BASKET 540X253X76MM

Accessories:
Nil

Optional (if any):
Nil

Clinical Specialty	Urology
Generic Name	**FLEXIBLE NEPHROSCOPE SYSTEM & ACCESSORIES**
Clinical Purpose	The flexible nephroscope can be used as the primary endoscope to manage renal calculi percutaneously. A small nephrostomy tract ("miniperc," 20F–24F) may be used. In addition, the flexible nephroscope obviates the need for special equipment necessary for rigid nephroscopy in the morbidly obese patient.
TECHNICAL SPECIFICATIONS	
Flexible Nephroscope System, consisting of Nephroscope 15-17 FR, length 37cm or above, Angle up 210 degree and down 120 degree Dilatation Set (Metallic) Grasping forceps (Quantity 5) Biopsy forceps (Quantity 5) Three /Two Prong grasping forceps Alligator type forceps (Quantity 5) Suction connector and tube Maintenance kit, carrying case Sterilizing case	
Accessories: Nil	
Optional (if any): Nil	

Clinical Specialty	**Urology**
Generic Name	**ENDO-UROLOGY FULL HD SINGLE CHIP CAMERA SYSTEM**
Clinical Purpose	HD Video system is used with Endourology procedures in adult and peads including Cystoscopy (Rigid/Flexible), Resectoscope (TUR/TURs), URS (Rigid/Flexible), PCNL (standard /Mini/Micro)

TECHNICAL SPECIFICATIONS

Camera Single Chip Full HD

Technology:	Full HD Single Chip 1 CCD / 1 CMOS *(procuring agency to specify)*
Resolution:	1920 x 1080 or better
Scan Mode & input:	Progressive
Aspect Ratio:	16:9 or better
Camera Head buttons:	2 or more programmable buttons
Zooming:	Digital or Optical Zoom
Focal Length:	13 / 14 / 15 / 16 mm or better
Features:	White balance facility, 5 or more user registration facility
Power Requirements:	220 V, 50 Hz

Video Processor Full HD

Video Processor:	Full HD Camera Video processor
Input:	Full HD Camera Head connection
Resolution:	1920 x 1080 progressive
Aspect Ratio:	16:9 or better
Video Output connection:	DVI / HDMI / SDI / HD
Power Requirements:	220 V, 50 Hz

Light Source

Lamp type:	LED Light Source *(the replacement of lamps shall be the responsibility of the supplying firm during warranty period)*
Lamp life:	20,000 or more
Control:	Knob or Buttons
Light guide cable:	Diameter 3.5mm or more, length minimum 200 to 300 cm.

Power Requirements:	220 V, 50 Hz

Display

Monitor:	30” Full HD Medical Grade LCD / LED or better
Resolution	1920 x 1080 progressive
Aspect Ratio	16:9 or better
Video Input	DVI / HDMI / SDI
Video Output	DVI / HDMI / SDI
Power Requirements:	220 V, 50 Hz

Recording System HD

Built-in or External Video HD recording system *(Procuring agency to specify)*

In case of External Video Recording system, specifications are as under:

System type:	Built-in processor system or External Device (OEM Recommended)
Dual function:	Should be able to capture still images and video recording at same time
Still Images:	FULL HD (JPEG) (1920x1080)
Video Capturing:	Full HD (MPEG4) (1920x1080P)
Input Ports:	DVI / HDMI / SDI
Data Storage:	External USB type or internal hard drive (500 GB) *(procuring agency to specify)*
Power Requirements:	220 V, 50 Hz

Special Features Requirement

Automatic while balance.

Powerful video signal processing.

Picture in picture mode control via camera head button / monitor. *(Procuring agency to specify)*

Control of peripheral i.e recording system parameter via camera head buttons.

Still image capturing in Full HD quality (JPEG) format via camera head buttons.

Video capturing in full HD quality (MPEG 4 format) via camera head buttons.

ACCESSORIES:

- Full HD Urological scopes *(procuring agency to specify)*
- Equipment Cart or Trolley (Same Manufacturer / Compatible imported / Local made) *(procuring agency to specify)*

OPTIONAL:

Pendulum Single Chip Full HD Camera Head for End-Urology (optional)

Technology:	Full HD Single Chip 1 CCD / 1 C-MOS (procuring agency to specify)
Resolution:	1920 x 1080 or better
Scan Mode & input:	Progressive
Aspect Ratio:	16:9 or better
Camera Head buttons:	2 or more programmable buttons
Zooming:	Digital or Optical Zoom
Focal Length:	13 / 14 / 15 / 16 mm or better
Power Requirements:	220 V, 50 Hz

Clinical Specialty	**Urology**
Generic Name	**ENDO-UROLOGY FULL HD THREE CHIP CAMERA SYSTEM**
Clinical Purpose	HD Video system is used with Endourology procedures in adult and peads including Cystoscopy (Rigid/Flexible), Resectoscope (TUR/TURs), URS (Rigid/Flexible), PCNL (standard /Mini/Micro)

TECHNICAL SPECIFICATIONS

Camera Three Chip Full HD

Technology:	Full HD Three Chip 3 CCD / 3 C-MOS *(procuring agency to specify)*
Resolution:	1920 x 1080 or better
Scan Mode & input:	Progressive
Aspect Ratio:	16:9 or better
Camera Head buttons:	2 or more programmable buttons
Zooming:	Digital or Optical Zoom
Focal Length:	13 / 14 / 15 / 16 mm or better
Features:	White balance facility, 5 or more user registration facility
Power Requirements:	220 V, 50 Hz

Video Processor Full HD

Video Processor:	Full HD Camera Video processor for 3-chip (3CCD / 3C-MOS) Camera
Input:	Full HD 3-chip (3CCD / 3C-MOS) Camera Head connection
Resolution:	1920 x 1080 progressive
Aspect Ratio:	16:9 or better
Video Output connection:	DVI / HDMI / SDI / HD
Power Requirements:	220 V, 50 Hz

Light Source

Lamp type:	LED Light Source *(the replacement of lamps shall be the responsibility of the supplying firm during warranty period)*
Lamp life:	20,000 or more
Control:	Knob or Buttons

Light guide cable:	diameter 3.5mm or more, length minimum 200 to 300 cm.
Power Requirements:	220 V, 50 Hz

Display

Monitor:	30” Full HD Medical Grade LCD / LED or better (for 3-chip camera)
Resolution	1920 x 1080 progressive
Aspect Ratio	16:9 or better
Video Input	DVI / HDMI / SDI
Video Output	DVI / HDMI / SDI
Power Requirements:	220 V, 50 Hz

Recording System HD

Built-in (50 GB or better) or External Video HD recording system *(Procuring agency to specify)*

In case of External Video Recording system, specifications are as under:

System type:	Built-in processor system or External Device (OEM Recommended)
Dual function:	Should be able to capture still images and video recording at same time
Still Images:	FULL HD (JPEG) (1920x1080)
Video Capturing:	Full HD (MPEG4) (1920x1080P)
Input Ports:	DVI / HDMI / SDI
Data Storage:	External USB type or internal hard drive (500 GB) *(procuring agency to specify)*
Power Requirements:	220 V, 50 Hz

Special Features Requirement

Automatic while balance.

Powerful video signal processing.

Image enhancement modes.

Picture in picture mode control via camera head button/monitor.

Control of peripheral i.e light source, recording system parameter via camera head buttons.

Still image capturing in Full HD quality (JPEG) format via camera head buttons.

Video capturing in full HD quality (MPEG 4 format) via camera head buttons.

20 individual presets or better.

20 patient data backup or better.

ACCESSORIES:

- Full HD 3-chip (3CCD / 3C-MOS) Urological scopes *(procuring agency to specify)*
- Equipment Cart or Trolley (Same Manufacturer / Compatible imported / Local made) *(procuring agency to specify)*

OPTIONAL:

Pendulum Three Chip Full HD Camera Head for End-Urology (optional)

Technology:	Full HD Single Chip 3 CCD / 3 CMOS (procuring agency to specify)
Resolution:	1920 x 1080 or better
Scan Mode & input:	Progressive
Aspect Ratio:	16:9 or better
Camera Head buttons:	2 or more programmable buttons
Zooming:	Digital or Optical Zoom
Focal Length:	13 / 14 / 15 / 16 mm or better
Power Requirements:	220 V, 50 Hz

Clinical Specialty	**Urology**
Generic Name	**ENDO-UROLOGY 4K CAMERA SYSTEM**
Clinical Purpose	4K Video system is used with Endourology procedures in adult and peads including Cystoscopy (Rigid/Flexible), Resectoscope (TUR/TURs), URS (Rigid/Flexible), PCNL (standard /Mini/Micro)

TECHNICAL SPECIFICATIONS

Camera Head 4K UHD

Technology:	4k UHD or better
Resolution:	3840 x 2160 or better
Scan Mode & input:	Progressive
Aspect Ratio:	16:9 or better
Camera Head buttons:	2 or more programmable buttons
Zooming:	Digital or Optical Zoom
Focal Length:	13 / 14 / 15 / 16 mm or better
Features:	White balance facility, 5 or more user registration facility
Power Requirements:	220 V, 50 Hz

Video Processor 4K UHD

Video Processor:	4 K UHD Camera Video processor
Input:	4K UHD Camera Head connection
Resolution:	3840 x 2160 progressive
Video Output connection:	DP / 3G-SDI / 12G-SDI / HDMI / HD-SDI
Aspect Ratio:	16:9 or better
Power Requirements:	220 V, 50 Hz

Light Source

Lamp type:	LED / Xenon Light Source *(procuring agency to specify) (the replacement of lamps shall be the responsibility of the supplying firm during warranty period)*
Lamp life:	20,000 / 500 hours or more *(procuring agency to specify)*
Control:	Knob or Buttons
Light guide cable:	diameter 3.5mm or more, length minimum 200 to 300 cm.

Power Requirements:	220 V, 50 Hz

Display

Monitor:	30” 4K UHD Medical Grade or better
Resolution	3840 x 2160 progressive
Aspect Ratio	16:9 or better
Video Input	DP / 3G-SDI / 12G-SDI / HDMI
Video Output	DP / 3G-SDI / 12G-SDI / HDMI
Power Requirements:	220 V, 50 Hz

Recording System HD

Built-in or External Video HD recording system

In case of External Video Recording system, specifications are as under:

System type:	Built-in processor system or External Device (OEM Recommended)
Dual function:	Should be able to capture still images and video recording at same time
Still Images:	FULL HD (JPEG) (1920x1080)
Video Capturing:	Full HD (MPEG4) (1920x1080P)
Input Ports:	DVI / HDMI / SDI
Data Storage:	External USB type or hard drive (1 TB)
Power Requirements:	220 V, 50 Hz

Special Features Requirement

Automatic while balance.

Powerful video signal processing.

Image enhancement modes.

Picture in picture mode control via camera head button/monitor.

Control of peripheral i.e. light source, recording system parameter via camera head buttons.

Still image capturing in Full HD quality (JPEG) format via camera head buttons.

Video capturing in full HD quality (MPEG 4 format) via camera head buttons.

20 individual presets or better.

20 patient data backup or better.

ACCESSORIES:

- Compatible to UHD Urological scopes *(procuring agency to specify)*
- Equipment Cart or Trolley (Same Manufacturer / Compatible imported / Local made) *(procuring agency to specify)*

OPTIONAL:

Display

Monitor:	55” 4k UHD Medical Grade Monitor LCD / LED or better
Resolution	3840 x 2160 progressive
Aspect Ratio	16:9 or better
Video Input	DP / 3G-SDI / 12G-SDI / HDMI
Video Output	DP / 3G-SDI / 12G-SDI / HDMI
Power Requirements:	220 V, 50 Hz

Clinical Specialty	**Urology**
Generic Name	**MOTORIZED BI-PLANER MOBILE C -ARM SYSTEM**
Clinical Purpose	Motorized Bi-Plane mobile C-Arm surgical imaging technology provides live views in two planes during Urological procedures to ensure reduction in dose, procedure time and infection risk, while increasing accuracy without needing the repositioning of equipment or patient to acquire images in longitudinal and lateral position simultaneously.
TECHNICAL SPECIFICATIONS	
Fully motorized mobile Bi-Plain C-Arm for Radiography and Fluoroscopy High frequency generator with 4 KW or more output 40 to 120KV with continuous Fluoroscopy facility at 7mA or more Automatic shut off after 10sec continuous expose C-Arm should have ± 45 degrees motorized rotation in both orbital and axial directions Continuous Fluoroscopy mode: 0.2 - 7mA or more Pulse Fluoroscopy Mode: 0.2 - 28mA or more Built-in hard disk for minimum 100,000 image storage capacity Two rotating Anode X-Ray Tubes Dual Focal spots 0.3 mm and 0.6 mm. Anode heat storage capacity should be 300 KHU or more Automatic Object Tracking facility Automatic kV and mA optimization Automatic Fluro dose control with single and cumulative dose rate display Dual image intensifier system of 9-inch size each High sensitivity CCD camera with 1024x1024 pixels resolution Memory for last image hold and last cine loop hold Auto storage facility for 100,000 or more images Display: Two (18”) LCD medical grade monitors, on separate Mobile Trolley Main monitor: 18” or better flicker-free Grayscale medical grade LCD having 1280 x 1024 resolution Control monitor: 18" or better Grayscale LCD having 1360 x 768 resolution A/D Conversion Depth should be 12-BIT or better Motorized IRIS Collimator	

Automatic Collimator adjustment with the SID alteration

Remote Control for collimator

Emergency switches on control unit and C-Arm

Fluoroscopy footswitch: One cassette holder 24x30cm

Laser Pointing / localizer device, lights cross beam type

DICOM 3.0 compatible (Print, Store, Worklist)

Motion Adaptive Recursive filtration and integration for noise suppression.

Automated Histogram based Image Brightness and Contrast Optimization

User Interactive Contrast and Brightness Adjustment

Panoramic real time image acquisition

Automated stitching algorithms to acquire full-length images of both planes

Adaptive Edge and contrast enhancement

Horizontal and vertical image flipping

Real time digital image rotation

Image Inversion, zoom, annotation, real time sharpening and denoising

DSA software should be provided.

Bidder Will be responsible for arrangement of all installation requirements, console, Electric DB, lead shielding, UPS Installation for room finishing / preparation.

ACCESSORIES:

- Lead Apron
- Lead Neck Collar
- Lead Googles
- Protective Lead Cap
- Gonad Protector
- Thyroid shield

NOTE: Procuring agency to define the quantity of each accessory, as per requirement

Optional (if any):

Nil

Clinical Specialty	Urology
Generic Name	**BLADDER WALL THERMOCHEMOTHERAPY**
Clinical Purpose	It is used for minimally invasive non-ablative high temperature treatments (hyperthermia) for urological diseases
TECHNICAL SPECIFICATIONS	
• Controlled conductive Heat for drug stability • Must have capability for high-rate circulation in the bladder continuously for bringing fresh / heated drug in contact with all bladder walls • Must maintain uniform bladder wall temperature • Temperature range up to 44^{o} C • 18Fr flexible catheter	
Accessories: BWT catheters (18 Fr silicone catheter 10)	
Optional (if any): Nil	

Clinical Specialty	Urology
Generic Name	**EXTRACORPOREAL SHOCKWAVE SYSTEM FOR TREATMENT OF ERECTILE DYSFUNCTION (ESWT)**
Clinical Purpose	• **Vascular Erectile Dysfunction** • **Induratio penis plastica (IPP)** • **Treatment of pain caused by superficial plaques.** Combination system for ESWT including a focused shockwave transmitter for treatment of erectile dysfunction. The system should be supplied as trolley version. Low energy shockwave system with focussed transmitter for use in all urological indications like erectile dysfunction, IPP & CPPS. Electromagnetic shockwave generator enables precise application and gentle dosing of the shock wave energy. All the essential control elements should be available on the hand piece specially the frequency and energy level can be adjusted directly at the hand piece.

TECHNICAL SPECIFICATIONS

- Electromagnetic shockwave principle
- Focal Zone depth: 0-55 mm or better
- Penetration depth: 0-60mm or above
- Energy in Focus: 0.010-0.55 mJ/mm^2 or better
- Hand piece weight: max 600 gm or better
- Shockwaves: 1 million shockwaves
- Coil replacement possible.
- Possibility to connect an external monitor
- System should allow user to create and store his own programmes.
- 8” or better touch screen control
- Patient annotation and storage should be possible with USB access for read out of the stored data.
- Unit should be equipped with software indicating errors or service measurements.
- Mobile trolley mounted system
- Shockwave frequency: 300/minute or better
- Application Linear segments
- Shockwaves per session: 2500 or more
- Shockwave duration: 5-10 minutes or more

Accessories:
Nil

Optional (if any):
Nil

Clinical Specialty	Urology
Generic Name	**INTRACORPOREAL LITHOTRIPSY SYSTEM (COMBINE AND SEPARATE MODE OF BALLISTIC, ULTRASONIC AND SUCTION)**
Clinical Purpose	Advanced auto adaptative algorithm delivers precise, constant ultrasonic energy for fine fragmentation and dusting of urinary stones. Breakthrough electromagnetic technology generates real ballistic energy for powerful and coarse fragmentation of large and hard urinary stones. Wide hollow probe and precise suction guarantee continuous removal of even large urinary stone fragments.

TECHNICAL SPECIFICATION

Synergy of 3 modalities in a single-probe (Ballistic impacts for powerful fragmentation / ultrasounds for fine dusting / smart suction to remove large stone fragments).

Independent generation of ballistic impacts and ultrasounds that can be used independently or simultaneously.

Possibility to adjust the power and frequency (1-12 Hz) of the impacts, the power of the ultrasounds and the flow rate of the suction.

Auto-adaptative algorithm allowing precise and constant generation and propagation of 100% the ultrasounds.

Clinically-proven fastest stone clearance. Two times faster stone fragmentation compared to competitive dual-energy in a single-probe lithotripters, and three times faster than the Combined mode of Lithoclast (Pneumatic and Ultrasonic).

Largest lumen available on the market (8.6 mm^2 compared to 7.8 mm^2 on probes of competitive dual-energy in a single-probe lithotripters) allowing the removal of large stone fragments up to 3.3mm of diameter without grasping baskets.

Reduced to nearly zero retropulsion effect for more accurate stone control, thanks to 8x smallerdownward ballistic probe tip displacement compared to Combined mode of Lithoclast (Pneumatic and Ultrasonic) (clinically-proven).

Integrated peristaltic pump to streamline suction rate, avoiding the need of external suction system, optimizing the endoscopic vision and reducing the risk of organ collapse due to under pressure in the kidney.

Disposable Stone Catcher enfranchising from using additional stone retrieval consumables, while allowing sterile stone fragments collection for analysis without any treatment interruption.

Extended range of disposable probes compatible with most endoscopic options, including mini and micro nephroscopes to suit individual patients' needs by addressing all type of stones throughout the urinary tract.

RFID recognition of the probes for an automatic set of best treatment parameters on the console.

Footswitch activation of the suction and the delivery of energies, for hand-free operations

Record of data of last 5 treatments

HDMI display option to View the console screen

Touch Screen Console

Integrated colling system to avoid over heating

ACCESSORIES:

- LITHOCLAST Main Unit
- Foot pedal
- Handpiece Kit
- Support Stone Catcher
- Suction Bag
- Electrical cord 6m
- HDMI cord 10m
- Filling Bottle
- De-ionised water bottle
- Torque Wrench
- Cleaning rod for Probes
- Imported original Cart
- Lithoclast Probes disposable (50 probes at end user Choice)
  Available Sizes (compatible with URS, Mini PCNL & Standard PCNL)
  - Lithoclast probe Ø 3.9 x 350
  - Lithoclast probe Ø 3.9 x 440
  - Lithoclast probe Ø 3.4 x 340
  - Lithoclast probe Ø 3.4 x 445
  - Lithoclast probe Ø 1.9 x 341
  - Lithoclast probe Ø 1.5 x 440
  - Lithoclast probe Ø 1.1 x 425
  - Lithoclast probe Ø 1.1 x 520
  - Lithoclast probe Ø 1.1 x 625

OPTIONAL (IF ANY):

Nil

Clinical Specialty	**Urology**
Generic Name	**INTRA-OPERATIVE ULTRASOUND**
Clinical Purpose	The intra-Operative ultrasound and sophisticated software algorithms, real-time imaging platform enables urologists to guide urology procedures with confidence It is used during surgery for urological applications with provision of biopsies through needle guides.

TECHNICAL SPECIFICATIONS

- High Resolution Digital Imaging dedicated for Urology with simple work flow and small foot print
- The system should have excellent images with high spatial, temporal, and contrast resolution with little adjustment
- Provision of wide range of Sterilizable Urology Transducers
- Small foot prints and design to fit the system in tight space
- 19" or better LCD / LED / OLED monitor for the clear visualization of the images
- Provision of button for activation of transducers, freeze, print and store images
- Provision of four transducers connectivity at same time
- Advance modes including 3D Elastography, contrast imaging and Needle enhancement
- Should have built in function of the auto optimized imaging using No touch Auto gain and Auto focus features
- Color Doppler should provide excellent real time visualization of vascular perfusion
- Built in battery backup of 60 minutes or better
- Sterilizable remote control
- Provision of advance features including prostate cancer and benign prostatic Hypertrophy (BPH)

Parameters:

Imaging Modes	B(2D), M, PW Spectral Doppler, CW Spectral Doppler, Color Flow Mapping, Power Doppler, Tissue Harmonic Imaging (THI), Elastography, contrast imaging
3D imaging Modes	Free Hand 3D Reconstruction
B Mode Techniques	Digital Beam former, Speckle reduction, Compound imaging, Dynamic focusing
Display:	19" inch or better
Keyboard height:	Adjustable
Frequency range	2-18 MHz or better
System Dynamic range	180 dB or better
Scanning Depth Min	2 cm or better
Scanning Depth Max	30 cm or better
Number of grey level	256 or better
B Mode Grey Scale	256 or better
Auto Line Density in B Mode	
Display dynamic	50- 90 dB or better

Multi frequency in B mode facility
B Mode colorization facility
Image storage capacity 50,000 or better
Power Requirements: 200V, 50 Hz

OPERATING MODES:

B Mode
Combination Mode
3D Mode
Power Mode
PW Doppler Mode
CW Doppler Mode
M Mode
Color Mode
Digital beam Former
Compound imaging
Speckle Reduction
Dynamic Apodization
Multi Beam processing
Sweep speed 2 – 12per second

CONNECTIVITY AND PERIPHERALS

High-Resolution Display
DVD/ CD Recorder, USB Port, Ethernet Port
4 x Active Transducer Ports
Built-In Hard Disk Drive (500GB) or better
12 inch or better touch screen LCD display
Data Management and review facility with thumb nail
HDMI / SVHS / VGA Output
Built in patient Archive
Needle Guide for Biopsy with Biplane and route through the transducers.
The system must be Quoted complete with Standard Urology applications software and Accessories

ACCESSORIES:

- 4 - 10 MHz Multi frequency Endo-cavity Biplane Transducer
- 2 - 6 MHz Multi frequency Curved Transducer
- Foot Switch
- Printer compatible with Doppler
- Keyboard
- Compatible online sine wave UPS for battery backup of 30 min or better

OPTIONAL:

- Complete stepper system compatible with Brachytherapy
- 5 – 18 MHz Linear Transducer
- 4 - 14 MHz Triplane transducer
- **IMAGE FUSION**

- Single System should be able to simultaneous display MRI/ CT and real-time ultrasound images on one monitor.
- Fusion should support scan selection in transverse, sagittal and end fire

Clinical Specialty	Urology
Generic Name	**THULIUM FIBER LASER 60 WATT**
Clinical Purpose	Used for Stone, BBH and Tissue Treatment

TECHNICAL SPECIFICATIONS

Thulium fiber laser uses long thin and thulium doped silica fiber as the active laser medium. Multiple diode lasers are pumping energy through the fiber and excited the thulium ions. Photons are emitted at 1940nm wavelength and directed at the operational field via on outgoing laser fiber. There are two operating modes to choose from the continuous and pulsed mode. Furthermore TFL can operate within different energy frequency and pulse shape settings. A highly efficient pumping mechanism allows obtaining high powers while generating small amounts of heat. Consequently there is a significantly smaller cooling apparatus in the machine compared to other laser systems, reducing the overall weight of a TFL system. Thanks to the thin gain medium and more uniform spatial profile, smaller surgical fibers can be employed.
More effective stone dusting with high frequency and better clearance and suction possibilities.
A safe alternative to treat soft tissue and BPH with better haemostasias
Low maintenance requirements, reducing long term costs and reducing down time.

Wavelength	1940nm+ - 20nm
Power max	Nominal max power output 60 w
Pulse energy	0.02-6j
Operating mode	Pulse and continuous mode
Pulse duration	Depending on peak power 100us-continuous
Repetition rate	1-2500Hz
Beam transmission	Optical fiber system
Aiming beam	Laser diode, green 532 nm (adjustable) <5mW, Class 3R
Cooling	Air
Housing	Tower format
Power supply	110-240VAC, 50/60 Hz 850VA
Pedal	Double foot switch with mode switching
Interface	7” touch display, 1280x800 resolution

Accessories:
1x foot pedal
2xset og safety goggles
1xfiber stripper
1xfiber cutter
1xinterlock connector
1xblast shield
1xfluid bag hook
1xpower supply cable
Smart fiber 200um (set of 5 fibers)
Smart fiber 272um (set of 5 fibers)
Smart fiber 365um (set of 5 fibers)
Smart fiber 550um (set of 5 fibers)
Smart fiber 800um (set of 5 fibers)

Smart fiber 1000um (set of 5 fibers)
Optional (if any): Nil

Clinical Specialty	Urology
Generic Name	**SURGICAL ROBOTIC SYSTEM**
Clinical Purpose	To be used in Minimal Invasive Robot Assisted operative procedure

TECHNICAL SPECIFICATIONS

The equipment must be capable of performing minimally invasive robot assisted operative procedures in multi therapeutic areas. The provided system must be the latest generation/ later model at the time of procurement.
The Main Equipment should comprise of the following fully integrated subsystems.

An ergonomic console: - on which the surgeon can operate seated comfortably from a distance by hand controls on the console and issuing instructions at the instrument which are connected to the different arms of the robot. The motion of the hands of the surgeon need to be scaled and need to be translated for the instrument arms of the robot in a very fine and precise manner

Robot Arms: - Modular, separate and interchangeable instrument arms that are capable of holding instruments and one arm for endoscopic camera for performing robotic surgery.

A Video system: - of high quality to process and transmit the video information during the intervention. This system needs to produce high definition 3D image through the camera to get a perception of depth.

Ultra-High-quality 3D view: of the field using next generation light adapting technology. The elimination of any focusing required with infinite depth of field technology.

System should be capable for virtual training with the Surgeon Console to practice & enhance surgical skills of new & existing robotic surgeons.

System should be Capable enough to use

Reusable, Autoclave able instrumentation: - the system should allow for robotic control of instruments that are reusable.

The instruments should be able to be cleaned and sterilized using autoclave technology and not require additional, less standard sterilization method.

High-quality three-dimensional view of the field of operation is to be provided by the Vision system through its stereo endoscope.

LED light source to be provided for illumination of the surgical field with a standby lamp.

Instruments to be used with the system should be able to provide surgeons with natural dexterity and a range of motion equal to the human hand.

Such instruments should be able to offer a wide range of tips suitable for performing procedures across multiple disciplines. These Instruments shall offer Seven degrees of motion mimicking the dexterity of human Hand with 720 degrees of shaft rotation.

The hand controllers at the surgeon's console should be capable of translating the natural hand and wrist movements in to corresponding precise and scaled movements to the instruments and camera attached to the arms minimizing fatigue. Such movements of the instrument tips shall replicate the experience of open surgery.

There should be facility for scaling of surgeon hand movements to corresponding smaller instrument tip movements. The surgeons hand movements shall be replicated at the instrument tip after filtering tremors if any in real time.

The endoscopes should be capable to view at 0 degree and 30 degree.

The ability to quickly change instruments during surgery should be a key feature.

Camera should provide high resolution images of the operative field along with perception of depth of field.

The system should perform self-checks to provide safety during usage

The system should have software required to safely use the system. Software upgrades should be given free of charge to the institution to ensure the latest version of software is always running on the system - without expense to the institution

Ability to change instruments during surgery safely with proper guidance

Auxiliary Monitor to provide ability for the assistants in the OR to see surgeon's view

Ability to adjust the surgeons monitor and console to suit individual comfort and ergonomics should be available.

Ability to enable the surgeon to view 2D as well as 3D HD image

While the robotic arms shall be operated by sterile persons the surgeons console shall be non-sterile are in the Operating room.

Adequate safety features to prevent inadvertent movements of the surgeon affecting the instruments shall be available.

The arms shall be easily movable within the OR.

The system shall have all software required to support all disciplines of surgery which is possible by the system under the control of the surgeon.

Ability to change the instruments during surgery safely All equipment shall be capable of working on 230 V AC, +/- 5%, 50 Hz Power supply. The system shall be capable of working between 17 to 25 Deg C air-conditioned environment. Emergency spares that may be required for immediate replacement during procedures. A set of Reusable accessories required for common procedures Instrument for 200 procedures should be included in the package which includes hook, dissectors, needle holder, and energy instruments (Monopolar & Bipolar)
Accessories: Nil
Optional (if any): Nil