



**BIOMEDICAL ENGINEERING UNIT**  
Regional Atoll Health Services Division  
Ministry of Health, Mal'e, Rep of Maldives

**MEDICAL EQUIPMENT SPECIFICATION**

**IMAGER, Radiographic Unit, digital**

**OPERATIONAL REQUIREMENTS**

- Integrated tube stand assembly with no ceiling supports to ensure fast installation
- 4-way floating table top examination bed
- Rotating Tube stand that supports off-table radiography
- High frequency generator with automated exposure control (AEC) and anatomical programmable radiography (APR).
- Wall stand for chest radiography
- The detector should be fixed type and move between horizontal and vertical positions.
- Maintain and manage data bank of all patient and image data.
- Retrieve and reproduce accurate, high quality high resolution images from stored data without loss of image quality

**TECHNICAL SPECIFICATIONS**

**Patient table /Horizontal Bucky**

- Tabletop height shall be adjustable from 60cm to 90cm approximately.
- Table top radiation absorption  $<0.75$  mm AL.
- Maximum patient weight 200 kg.
- High quality motorized scatter radiation grid.
- Longitudinal travel  $\pm 45$ cm or better.
- Transverse travel  $\pm 14$ cm or better.
- Floating tabletop of 70 cm width or better.



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- No less than 41 x 41 cm solid state digital flat panel detector with image matrix size of 3000 pixels x 3000 pixels or better to provide an image resolution of not less than 32 LP/cm.

#### **Vertical Detector stand:**

- Motorized movement from 35 to 170cm above the floor.
- Scatter radiation grid.
- No less than 41 x 41 cm solid state digital flat panel detector with image matrix size of 3000 pixels x 3000 pixels or better to provide an image resolution of not less than 32 LP/cm.
- -15°/+90° tilt able detector tray in 15° increments.
- Side support handles.
- Overhead handle.
- Securing strap.
- The bucky should have electromagnetic lock that allow for easy positioning.

#### **Column Stand**

- Horizontal travel range: 138 cm (54.3"), movement arrested by electromagnetic brakes
- Vertical travel range: 150 cm (59.1"), movement arrested by electromagnetic brakes
- Central beam height: 35 cm (13.8") to 185 cm (72.8")
- Rotation of tube around vertical axis:  $\pm 90^\circ$ ; stop positions:  $0^\circ, \pm 90^\circ$
- X-ray tube rotation:  $\pm 120^\circ$ ; stop positions:  $0^\circ, \pm 90^\circ$
- Manual and motorized collimator  $\pm 45^\circ$  rotation with motorized selection of filters.

#### **X-ray generator:**

- High frequency greater than 60 kW output power.
- Voltage range: 40-150 KV with 1KV steps.
- Shortest exposure time: 1 m sec.
- mAs range: 0.5 to 800 mAs.
- Automatic exposure control as well as anatomic programs.



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**X-ray tube:**

- Rotating anode type.
- Anode Heat capacity: 300 KHU.
- Cooling rate: 70KHU/minute approximately.
- Dual focus 0.6 and 1.0 mm.
- Tube over load protection.

**Workstation:**

- It shall be based on a high-end computer with high capacity hard disc drive capable of storing at least 3000 images.
- RAM: 2GB at least
- CD/DVD-RW drive
- 19" minimum high-resolution LCD screen monitor.
- It shall reconstruct complete images in less than 10 seconds / image.
- Operating software to include the following:
  - Patient study management.
  - Automatic exposure controls and post processing functions.
  - Pre-defined and customizable anatomically specific programs.
  - Image documentation and archiving.
  - All standard software packages shall be listed with the offer.
  - All optional software packages shall be listed and quoted separately.

**Accessories:**

- Minimum two adult size protective lead aprons with thyroid collar must be supplied.

**Warranty and maintenance:**

- Warranty period of minimum 24 months should be given starting from the date of installation.
- Advanced maintenance tasks required must be documented and carried out FOC during the warranty period.
- The equipment should have spare parts available for more than 15 years after the purchase dates.



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### Documentation:

- User, technical and maintenance manual must be supplied in English language.
- List to be provided of equipment and procedures required for local calibration and routine maintenances.
- List to be provided of important spares and accessories with their part numbers.
- Contact details of both local supplier and manufacture for service and maintenance and sales must be provided.

### Training:

- Application training must be given to the hospital radiographers /users
- Manufacturer standard technical training on service and maintenance must be given to the biomedical engineers/technicians of Ministry of Health.

### Other requirements:

- The system must be FDA approved and CE marked.
- It shall be fully DICOM compliant with all standard DICOM specifications with interface to the hospital RIS/PACS network/system.
- Bidders may inspect installation site prior to bidding their offers. Radiation warning lights shall be interlocked with system's power-on. Warning signs shall be installed by the supplier in accordance with international and local regulations. Equipment and computer cabinets and control console desk with operator chair shall all be included with the system.
- Radiation leakage must be tested during the installation by the supplier



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