



Date: 18 October 2023

### الموضوع/ مواصفات أجهزة CT 128 Slice + Digital Basic X-Ray

Item	Name	QTY	Estimated unit price USD	Estimated total price USD
01	CT scanner 128 Slice	1	850,000	850,000
02	Digital Basic X-Ray	1	150,000	150,000
<b>Total estimated price USD</b>				<b>1,000,000</b>

#### *01. CT scanner 128 Slice*

#### Functional and Technical Specifications:

- Manufacture (USA, Europe & Japan).
- Up gradable system.
- Spiral C.T / scan with multi- slice technology
- Spiral CT Pitch factor minimum 0.2
- Flat LCD Colored monitor 21"
- Two Additional Work Station OR Server with 5 users (medical grade monitors )&Dicoms .

#### Gantry

- Gantry aperture at least 70 cm
- Gantry tilt angle  $\pm 30^\circ$ .
- Slip ring for power supply: Low voltage.

#### X-Ray generator

- 70 KW High frequency X-ray generator matching tube power.
- KV range: 80 – 130 KV.
- mA range: 20 - 500 mA.
- Collimation: should have adaptive dose reduction facility (Adaptive Shield).
- Should have the facility of Pediatric Specific Dose Control.

#### Automatic Exposure Control



- Automatic Control (AEC – mA modulation) software (dose Control)
- mA adjustment for patient size.
- mA adjustment along the z-axis.

### **Tube**

- Anode heat storage capacity more than 7 MHU.
- Multi focal spots.
- Method of tube cooling: Air/Oil cooling.

### **Patient Table**

- Load capacity at least 200 kg.
- Motor driven.
- Tabletop: Carbon-fiber.

### **Detector**

- Solid State array fast scintillation detector material
- 128 slices imaging system.
- Number of Detector rows 64 rows
- Maximum number of simultaneously acquired data sets is 128 slices.

### **Scan Parameters**

- Dynamic Scan mode.
- Spiral Configuration not less than 128 Slices
- Spiral Scan up to 100 Sec.
- Scan time: 0.4 sec / 360° or less preferable.
- Capable of different spiral protocols.
- Slice thickness: at least 0.6 mm or less preferable.
- Max of 50 seconds of continuous spiral scanning.
- Field of view must be up to 500 mm.
- Suitable for dens object.

### **Main console**

- From the Same Source and Origin



- Diagonal dimension of image screen: at least 21”
- Image area matrix dimensions: 1024 x 1024
- Control methods: Mouse, keyboard.
- DICOM services on Main Console
- Connectivity to Internal network DICOM interface enables connectivity to DICOM modalities.

**Data Processing:**

- Hard disk at least 2 Terabyte (TB) raw data. External HD 5 Terabyte (TB).
- Reconstruction matrix 512 x 512 Display matrix 1024 x 1024.
- Max. Reconstruction fields of view: not less than 5-50 cm.
- Min. slice thickness: 0.6-10 mm.
- Spatial Resolution at. Least 24 lp/cm @ 0 MTF, Specify
- Simultaneous scanning and archiving and/or hard copying
- Simultaneous scanning and transfer to second workstations
- System should have PACS interface ready without any new hardware or software.
- Reconstruction time more than 20 images/sec.
- Archival storage should be by DVD drive using a commercially available DVD.
- Dicom 3.0 compliance inducing all different items.
- Real time display
- Fully DICOM 3.0 compliant including

**Two Additional working- station Including or Server with 5 users & Dicoms at least (optional Priced Separately):**

- Including MPR-3D-VRT Software Package
- Original PC equivalent Precision workstation
- 4 GB RAM
- Hard-disk at least 1 Tira for storage (1024 x 1024) images matrix
- 2nd CPU for high-speed performance
- High-resolution flat panel LCD color monitor at least 19".
- CD-DVD Writer: DICOM image storage on CDs or DVD-Rs
- Universal connectivity and full DICOM.
- The system should be capable of interfacing with HIS/RIS System



- Suitable UPS

**Standard Software Package:**

- 3D Package. (VRT-MPR-MIP).
- In space / volume rendering imaging or equivalent.

**Cardiac software full package priced separately including 2<sup>nd</sup> WS:**

- Coronary calcium scoring on both operator console and the additionally station.
- Cardiac function & analysis
- Coronary artery analysis.
- Circulation.
- EPS (Electrophysiological study) preferred.
- CT FFR (Fractional flow reserve) preferred.
- ECG editing trigger for scanning.
- Step & shoot
- Metallic Reduction Artifact.
- Software for body vessels **analysis** (Aorta & Peripheral vessels) **priced separately**.

**Other software package priced separately 2<sup>nd</sup> WS/ server with 5 users:**

- Fly through.
- Virtual Colonography
- Pulmonary nodule assessment.
- Lung nodule CAD.
- Advanced Brain Perfusion
- Body Perfusion
- Lung Function analysis.
- Dental.
- Osteo test

**Dual head Injector**

- Power Supply: 220 Vac  $\pm$  10%, 50 Hz.
- Floor mount.
- Disposable sterile syringe 200ml (Qty: 250 piece)



- Integrated with the CT system

#### **Lead Aprons**

- Large size Aprons (Qty 2)
- Medium size Aprons (Qty 2)
- Neck Collar (Qty 2)
- Eye glasses protection (Qty 2)

#### **Standard C.T Accessories**

- Head arm rest & coronal head rest
- Head holder
- Knee support
- Head Pad 3 size (small-medium-large)
- Immobilization strap
- Phantom for calibration
- Air Conditions Suitable for C.T room and the Department.
- ONE CD Publisher with full color cartilage ( Quantity 5sets).
- 5 Laptops C i7
- Furniture for staff and waiting hall.

#### **Power supply:**

- 3 ph., 380 Vac  $\pm 10\%$ , 50HZ

#### **Online U.P.S 100 KVA:**

- On-line UPS Suitable for the whole CT Room including the CT System and other systems with 10 min backup system. Moreover, Compatible with CT Powers.

#### **Training: (Option Price Separately)**

- Factory level service and maintenance training (agent not customer) for hospital engineer for the complete system should be submitted.
- Training for 2 doctors and 2 imaging technologists at a certified imaging center or hospital has the same model.

#### **Documentation**



- The supplier must provide User and service manual in English
- Attach original manufacturer's product catalogue and specification sheet. Photocopy/ computer print will not be accepted. All technical data to be supported with original product data sheet.
- The contractor must provide List of important spare parts, part number and costs.
- Country of Origin Certificate.
- All equipment should be from a branded source with a certified quality assurance system and have the following certifications:
  - CE Marking
  - FDA

**Pre installation: Option (optional Price Separately)**

- Site visit for agreement to all department requirements with MOH Engineers.
- Civil and mechanical work include all modification and reconstruction needed which include Building wall, Closing Window, and reinforced Concrete base for the Equipment
- Electrical work includes power cabinet & electrical connection with over- under voltage regulator and Groundings Connections.
- All additional hardware/software which may be required to assist networking capability
- Protection works include leaded wall cover with wood and painting.
- False Ceiling, lighting, PVC, Painting, and cable duct in the floor
- Doors for the Department with lead
- Building control room with Diagnostic window 100 \* 120 cm
- Connection for medical Gases outlets (Oxygen-Vacuum-Air) and ready for use to remove the old system.
- Modify the site to be ready to operate and installation the new CT.

**Maintenance & Warranty**

- Five years warranty including spare parts, and UPS.
- Equipment Including all parts should be from the original Manufacturer
- The contractor shall confirm the availability of spare parts for a period of 10 years beyond the warranty period.
- The Bidder should mention to the cost price of the X-ray Tube.
- The Bidder should mention the life span of the X-ray Tube.



- The Fixed X-ray tube and other essential parts Price for the next 10 Years will highly preferred.
- Manufacturer quality and performance inspection protocols must be adhered to.
- Turn-around time must not exceed 48 hours, there after a penalty must be applied.

## **02. Digital Basic X –Ray**

### **Functional and Technical Specifications:**

- Manufacture (USA, Europe & Japan) /else should be proven in MOH and has good reputation and high efficiency.
- A digital radiography system capable of detector exposure in vertical, horizontal and oblique positions to perform all skeletal body and chest radiography.
- The unit should be completely integrated (integrated Generator and Image Acquisition), including Two Digital flat panel detector fixed and wired detector systems with detectors integrated into the Bucky table as well as wall stand.
- Power supply: 3 phase, 380 Vac  $\pm 10\%$ , 50HZ

### **Generator:**

- Generator should be of latest technology with high frequency offering 100 kHz or more for constant output.
- Output 50 to 65 KW depend on location.
- KV range from 40KV to 150 KV.
- mA range from 10 mA to 650 mA
- Automatic exposure control device. (optional)
- Digital display or KVP & mAs.
- Anatomically Programmed Radiography (APR) programs.
- Separate X-Ray counsel with hand switch

### **Tube Support type:**

- Floor to wall mounting with counter balanced tube head.
- Mention range of tube Movements in all directions i.e. 3D transverse, longitudinal and vertical.
- All movements should have electromagnetic brakes with fully counter balanced mechanism.
- Facility to display FFD/SID. SID (Source to Image Distance) measurement.



- Provision of auto centering with the detector.

### **X-Ray tube and Collimator**

- Rotating anode high speed 9000rpm at least, compatible with the generator.
- Dual focus. Focal spots of the following sizes: large focus: 1.2 or more and small focus: 0.6 or less.
- Anode heat storage capacity 300 KHU or more.
- Mention range of tube movements in vertical, longitudinal and horizontal planes.
- Electromagnetic locks collision protection sensor.
- Should have over load protection with facility to Monitors temperature conditions.
- State anode angle in degrees.
- Air/Oil cooling.
- Should have over load protection.

### **Collimator**

- Copper pre filter.
- Collimation control Manual and Automatic
- Coll
- imation control Automatic (option)

### **X-Ray Table**

- Electromechanically control.
- Motorized Elevating up/down
- Floating top compact Bucky table with digital flat panel detector.
- Detector movement synchronized with the tube movement.
- Mention range of vertical, horizontal and longitudinal movements of the table.
- Length 210 cm. or and Width 80 cm at lesat.
- FPD is built in the system.
- Height (Please Specify the Maximum and Minimum table height)
- Can support patients weighing more than 200 kg.
- Floating tabletop 6-Way movement, Elevating (Up / Down) motorized, Longitudinal (Left & Right), Transverse (Front & Rear).
- Foot switch.



- Automatic exposure control should be available.
- Preferred detector with turned off ability for cassette shots.
- Removable Anti-Scattering Grid.

### **Vertical Stand**

- Electromechanically controlled.
- Counter balanced adjustable height vertical Bucky with digital flat panel detector.
- Detector movement should be synchronized with the tube movement.
- Field size programming should be possible.
- Up / Down range (Motorized & Manual).
- Automatic exposure control.
- Foot switch.
- Removable Anti-Scattering Grid.
- FPD is built in the bucky.

### **Digital Detector (Wall Stand, Table; Fixed)**

- The detector which will be supplied along with the system must be from the principal vendor or the principal company must be having joint venture/ collaboration for manufacturing of the detector.
- Digital flat panel detector system.
- The detector should be a flat panel detector of latest direct technology with Cesium Iodide scintillator.
- The detector must have fiber optic or ethernet connection to the digital imaging system.
- The size of the detector should be 43cmx43cm or more.
- Image matrix size (3k X 3k pixels).
- Active detector matrix 3072 X 3072pixels.
- Size of pixel: 143micron, or less.
- Spatial resolution: 3.5lines/mm or more.
- Operational interval time not less than 90 sec
- Full image transfer not less than 3 sec .
- DQE of detector system should be 65% or more at 0 lps
- Depth of grey scale: 14Bit or more.
- Tube assembly movement to be automatically synchronized with the detector movement.
- Should allow centered/de-c



- entered collimation.
- Specify refresh cycle (time for second exposure).
- State Maximum acquisition rate (frames/sec).
- Life of detector minimum 7years.
- Detector warm up time from standby less than 6 min.
- Detector warm up time from cold less than 30 min.
- In case detector failed, the bucky should be fit for any standard external cassettes
- Detector can be turned off for cassette shots.

### **Imaging Workstation**

- The system should include Image acquisition console and image review console for diagnosis purposes at the reporting room, including all needed works to be ready to use.
- CPU Intel® Core™ i7or Higher.
- RAM 8GB or Higher.
- HDD 1 TB or Higher.
- Latest high-speed digital workstation should be based on.
- Processors of at least 64 bits.
- Operating system Windows 7 or newer version.
- Accessories Keyboard, Mouse.
- Full HD 21" LCD Monitor (1920 X1080)
- CD/DVD recorder for digital image storage.
- USB export ports.
- Operating console should have facility for patient identity entry, viewing and processing images, documentation.
- Specify time for the image to appear on screen after exposure.
- Next exposure should be possible while processing is in progress on the operating station
- Image acquisition matrix should be minimum of 3K x 3K.
- Post-acquisition image processing, viewing, reprocessing, hard copy documentation and on ward transmission should be possible.
- Connectivity to laser printer.
- Easy integration and networking should be possible with any other existing/future networking including other modalities, HIS and RIS and PACS.



- The system should have ready DICOM interface and networking capability with RIS / HIS / PACS
- A standalone independent workstation connected with Digital X-ray.
- It should be capable of performing 2D post processing for all digital X-ray.

**Online U.P.S**

- Online 3 KVA Suitable for the computer system and detector.

**Lead Aprons:**

- Large size Aprons with neck (Qty 2)
- Medium size Aprons with neck (Qty 2)

**Laser Color Printer:**

- DICOM 3.0, HL7 Compliant.
- Resolution- at least 1200x1200 dpi.
- Paper kit.

**Standard Accessories:**

- Head arm rest & coronal head rest
- Head holder
- Knee support
- Head Pad 3 size (small-medium-large)
- Air Conditioning for the department, to be suitable for the system, and according to manufacturer recommendations.

**Tube and flat panel detector Prices:**

- The offer should mention for x-ray tube and the flat panel detector Prices.

**Maintenance & Warranty:**

- Five years warranty including tube, FPD, spare parts, and UPS.
- Warranty for not less than 10 years for spare parts.
- Equipment Including all parts, Tube, generator, and others should be from the original Manufacturer (USA – EUR – JAPAN).
- The Bidder shall confirm the availability of spare parts for a period of 10 years beyond the warranty period.



- The Vendor should provide commitment of seamless access to the System service and software keys for the M.O.H Engineers for all periods (in out of warranty).

**Training (optional Price Separately)**

- One service Engineer at Manufacturer, training shall be equal to the training provided to the Vendors service staff.
- On Site Training for the Technicians for a period of one Week.

**Documentation and conditions:**

- The supplier must provide User manual in English
- Attach original manufacturer's product catalogue and specification sheet. Photocopy/ computer print will not be accepted. All technical data to be supported with original product data sheet.
- The supplier must provide List of important spare parts
- The supplier must provide price of x-ray tube and detectors
- All equipment should be from a branded source with a certified quality assurance system and have the following certifications: CE, FDA marking
- Country of Origin Certificate.
- The Vendor should provide commitment of seamless access to System service and software keys for the M.O.H Engineers for all periods (in-out warranty)
- Equipment must be offered and the site plan must be made in consultation with MOH
- Complete unit will be delivered, Installation, operation with all standard accessories and ready for use.

**Pre installation according to suggested location: (Option Price Separately)**

- All works should be executed to ensure full and ideal operation of the department.
- All works should be according to department requirements and under supervision of hospital engineers
- Finishing works (civil, Arch., Elec. Mechanical, ...etc.) for all parts of the department, & shall include but not limited to:
  - Reinforced concrete base for the device
  - Tiling works (as that used in the site)
  - Cable ducts in the floor (steel channels or equivalent with cover)
  - Anti-static PVC, including copper strips and earth works
  - False Ceiling panels works and all needed steel trays for the devices and for the dept. as all.
  - Painting by using approved type of oil paintings



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- All power and data connections to sources and all needed works, suitable cables, sockets, keys, suitable circuit breakers, power cabinets, over and under voltage regulators
  - Lighting works (spot lights and panels)
  - Leaded door(s)
  - Establishing and finishing control room instead of the waiting area within the department, works include all civil, electrical, mechanical works and air conditioning. And works should include control table and leaded glass of 1mx 0.8m with all needed works and modifications for installation
  - Supply and install doors for the department and the control room
  - Temperature and humidity monitoring Device.
  - Preparation works for routes and entrances needed for entering and installing of equipment, and restoration works (when causing damages to existing works)