

DIGITAL RADIOGRAPHY SYSTEM WITH DUAL FLAT PANEL DETECTOR

1. The system should be capable of performing exposure in vertical, horizontal, and oblique positions to perform all skeleton body (upright and lying down) radiographs.
2. The unit should be completely integrated (integrated generator and Image acquisition).
3. It is possible to do all the general radiological imaging like abdomen, musculoskeletal, joints, PNS, Skull and Spine, etc. with the movement of tube assembly with auto position/auto-tracking in vertical position.
4. The unit should be a High-frequency Digital Radiography system with a rotating anode. 3D ceiling suspended stand with Auto-tracking & 2 separate fixed detectors in the table and vertical bucky each.
5. The equipment must be brand new and no refurbished item should be provided.


The system should have the following features.

A. HIGH-FREQUENCY GENERATOR:

1. The generator should be of the latest technology with a high-frequency 50KHz or more X-Ray generator.
2. The power output of 80KW.
3. KV range should be 40 to 150KV in 1KV/step.
4. mA output: up to 1000 mA (1000mA@80KV)
5. mAs range should be from 1mAs to 200mAs.
6. It should have a solid-state automatic exposure control device on the table & vertical bucky stand.

B. X-RAY TUBE: Rotating anode X-ray tube with Focal spots of:

1. Small focus: 0.6 mm
2. Large focus: 1.2 mm
3. Anode Heat storage capacity-more than 300KHU
4. Tube assembly heat storage capacity 2MHU


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5. Automatic Multi-leaf collimator having halogen lamp / bright light source and auto shut provision of the light.
6. DAP meter for patient dose measurement should be provided
7. HV Cable: 1 Pair of HV cables of suitable length.

C. TUBE STAND:

1. Motorized 3D- Ceiling Suspended tube stand should be a new generation stand providing the user three-dimensional movements of the tube head covering a huge area. Noiseless and swift up/down movement of the tube head should be provided.
2. Image review available on a touch display mounted on the tube assembly. LCD Touch screen display of SID, mAs, and Tube angle and patient data on tube collimator assembly.
3. Stand should have motorized Longitudinal, Transverse and vertical movements. It should have Tube Head Rotation along its axis.

Movements of the stand should be:

1. Motorized Longitudinal movement: more than 2500mm
2. Motorized Transverse movement: more than 1500mm
3. Motorized Vertical up/down movement: more than 1000mm
4. Tube head Rotation (along the vertical axis): $\pm 180^{\circ}$.
5. Tube head Rotation (along the horizontal axis): $\pm 135^{\circ}$.
6. Collision protection mechanism should be provided.
7. Tube assembly should have 3D auto-tracking on its control for synchronization with the detector fitted inside the vertical bucky stand & table.
8. SID (Source to Image Distance) in vertical position 150cm and in horizontal position 180cm

D. TABLE:

1. Horizontal 6-way table with a floating tabletop made up of carbon fiber material and motorized adjustable height should be provided. The tabletop should have three-dimensional movement.

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2. Table should be provided with an Inbuilt Fixed FPD (FLAT PANEL DETECTOR) beneath the table.
3. 1No. A removable grid should be provided.
4. Longitudinal travel of tabletop should be ± 47.5 cm & transverse travel of tabletop should be ± 13 cm.
5. Transverse and longitudinal movements of the tabletop should be locked by electromagnetic locks.
6. Table should have up/ down motorized movement and it should be controlled by two up & down footswitches.
7. Maximum weight carrying capacity for the table during up/down movement should be more than 150Kg.

E. VERTICAL BUCKY (VB) STAND:

1. Floor-mounted Motorized Vertical bucky stand should have an inbuilt fixed FPD (FLAT PANEL DETECTOR) for lung and skeleton x-ray examinations. It should have a user-friendly design and handling.
2. VB stand should have provision to do chest radiography with and without a grid.
3. Motorized Tilting should be -30 degrees to + 90 degrees.
4. Vertical up Down Movement should be 1200mm or more.
5. 1No. removable grid should be provided.

F. FLAT PANEL DETECTOR (One NO. EACH FOR TABLE BUCKY AND VERTICAL BUCKY):

Specifications:

1. The detector should be flat panel type with A-Si (amorphous silicon) and CSi as a scintillator.
2. Size of detector must be 43cm x 43cm.
3. Active Image matrix 3K x 3K.
4. Image depth should be 14bit.

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5. Pixel size should be less than 140um (Smaller pixel size is preferred)
6. Detector resolution should be more than 3.3 lp/mm.
7. DQE (Detector Quantum Efficiency) should be more than 65%.

G. OPERATING STATION/WORK STATION:

**a. X-RAY/IMAGE CONTROL
CONSOLE**

1. **Fully integrated system with the following features:**
2. Digital Display of KV & mAs.
3. KV & mAs increase and decrease control on G.U.I (Graphical user interface).
4. Ready and X-Ray ON indication on G.U.I (Graphical user interface).
5. Self-diagnostic Program which can diagnose and display error messages such as Earth fault error, KV error, Filament error & Tube's Thermal Overload.
6. An Inbuilt overload protection device.
7. Anatomical Programming Radiography (i.e. APR): Preprogrammed parameters of human Anatomy which helps the user to select exposure parameters based on body part, examination view and size of the patient. Since it is a computer based system (full system integration) so any number of Organ programming combinations is possible. User can define his own Organ parameters and can edit the existing parameters to his satisfaction and comfort level.
8. APR programs: More than 1000 programs. (Expandable as per user's requirement).
9. A dual action hand Switch with Retractable cord for Radiation Protection of Operator.

b. IMAGE ACQUISITION SOFTWARE

MINIMUM SOFTWARE CHARACTERISTICS:

The software provided should be having complete control of all image capture functions within the examination room. It should enhance the entire workflow by delivering diagnostic images instantly. It should also allow user to transfer X-Ray images electronically to remote workstations, image archives, and printers, also have an excellent performance on image quality control such as:

FEATURES REQUIRED

1. Digital image processing technology
2. Preview the image in less than 5 seconds.
3. Exam Specific Algorithms image processing for the consistent image quality of all body parts.
4. Image processing tools for different anatomy
5. Image cropping
6. Image mirror, rotate.
7. Image annotation
8. Add image accept/reject comments
9. Rejected images archival with the provision of converting them to Accepted images.
10. Separate log for Rejected, Accepted and Printed images.
11. True size for printing.
12. Hard disc capacity for image storage >3000 images.
13. Inbuilt CD/DVD writer facility
14. Remote online system diagnosis
15. Remote online software upgrade
16. Image quality control tools
17. Easy and quick Offset and gain calibration with bad pixel removal algorithm.

MAINTAINABILITY

FULL DICOM 3.0

COMPATIBILITY

1. Get DICOM work list
2. DICOM Print
3. DICOM Store

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4. Support DICOM MPPS

H. WORKSTATION with MONITOR: latest processor with 8GB RAM, and ≥ 1 TB SSD storage capacity with 1 No. 19" High Brightness Monochrome LCD/ LED Medical display monitor should be provided.

I. POWER SUPPLY REQUIREMENT:

3 Phase, 400Volts AC 50Hz with line Regulation $\pm 10\%$.

J. Accessory: A servo voltage stabilizer of suitable rating for a complete unit, a lead apron of 0.5 MM lead equivalence-2 nos. Thyroid guard-2 nos, gonad shield-2 nos.

K. Other Requirements:

1. The company should be ISO, EN ISO & ICMED certified.
2. The unit should be European CE or FDA approved.
3. The company should have a dedicated service center in the state.
4. Company should have a proven track record in the government sector.
5. Minimum 3 out of four major components i.e. X-Ray tube, X-Ray generator, Flat panel detector, and software should be from the same principal manufacturer of Digital X-ray system.
6. Turnkey requirements (Minimal Civil Work + Electrical Work + Change Room for the Patients).
7. Lead apron hanger must be provided.
8. AERB registration.
9. Printer must be provided and the printer should be having capability of printing various sizes of X-Ray films.
10. 5 Packets of the film should be provided.
11. One online three-phase UPS must be capable to provide sufficient backup for the entire unit for at least 30 minutes.
12. AERB Elora registration, system & layout must be as per the AERB norms/ requirements.
13. Company must own the responsibility & facilitate the commissioning & decommissioning of the X-ray machine.
14. All parts of the system must be available for at least 10 years.

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(Handwritten signatures and initials)





Conditions for tender:

1. All accessories should be from the same Original Equipment Manufacturer for the main unit.
2. Any equipment supplied along with the main unit; is the responsibility of the company to install the MRI scanner. The third-party maintenance should be properly taken care of and should not hamper with smooth functioning or maintenance of the equipment. However, the overall responsibility for the functioning of these third-party accessories will be the responsibility of the company, which is awarded the tender.
3. Cost of each hardware and software (Machine, coils, pulse sequences, computer, accessories, etc.) should be separately mentioned in the bid.
4. Instruments must be ISO certified and a copy should be enclosed. (The ISO Certificate must be issued by any organization accredited by the Bureau of Indian Standard or accredited by the international accrediting forum "IAF" (Certificate to be attached).
5. Should be USA FDA and European CE be approved by 4 digits notified body.
6. Other necessary certifications if any required will be provided by the bidder for the smooth functioning of the machine.
7. Installation process should be performed by O.E.M trained service engineers/ service representatives on OEM letterhead or Service Report within 15 days of supply, with the mandatory provision of providing preventive services visit of OEM trained Service Engineer/ Service Representative quarterly per year till the completion of warranty period (i.e., 20 visits for the first 05 years) & further quarterly visits (04 visits/year) year till the completion of CMC period.
8. The equipment should have a Brand name/ Model Number embossed/etched on the equipment.
9. All the technical specifications in the compliance statement must be supported by Original Literature from the firm/ O.E.M with highlighting Numbering & flagging of all technical certificates.
10. Offered Equipment should have a strong Government Installation base.

11. Offered Equipment should have a Regional Sales Service Centre of the Original Equipment Manufacturer in the region for a 95 % uptime guarantee.
12. For the offered main unit, the essential, optional required consumables'/accessories' shelf life should be declared on the Original Equipment Manufacturer's letterhead.
13. In case of technical snag/failure/breakdown the response time for the inspection should be within 24 hours and repair within 05 days otherwise provide a service machine/ alternate arrangement to be made till the period of recovery of the breakdown of the unit, failing which attracts penal action as per the decision of institute/ hospital.
14. For offered equipment the Training of technical staff and users should be performed by Original Equipment Manufacturer trained Service Engineers at the proper designated place- at bidders' cost.
15. Company should quote their latest model and need to provide an affidavit for the same.
16. As a tendering process the Demonstration of the offered Equipment is Mandatory at hospital/institute premises or other designated places at the bidder's cost.
17. The bidder must comply with the General Financial Rules and their modifications if any issued by the Government of India- 2017.
18. Any bidder from a country that shares a land border with India will be eligible to bid in the tender only if the bidder is registered with the Competent Authority (i.e., Registration certificate issued by the Ministry of Commerce and Industry (Department for Promotion of Industry and Internal Trade- DPIIT after October 2020). If any such bidder is not registered with DPIIT they will be liable for technical disqualification.
19. Principal (OEM) must authorize only one agent to be quoted in the bid otherwise multiple quotes through different agents in the same bid will be canceled.
20. The Bidder and its OEM both have to submit a notarized affidavit on the Indian Non-Judicial Stamp Paper of Rs.100/- that the bidder has not quoted the price higher than the current financial year and last financial year supplied to any government Institute/ Organization/ reputed Private Organization. OEM also has to submit that the price quoted by the bidder in the bid is on its behalf and the lowest in the current and last

financial year in the country. Therefore, if at any stage it has been found that the supplier and its OEM have quoted lower rates than those quoted in this bid; the Institute (the purchaser) would be given the benefit of lower rates by the Supplier and any excess payment if any, will become immediately payable to the Institute (the purchaser). If such an affidavit is not submitted, the bid will be outrightly rejected. (Part of technical bid).

21. Guarantee/ Warranty Period: Separate offers of Comprehensive Maintenance Contract (CMC on main equipment) and Annual Maintenance Contract (AMC on main equipment) for further 5 years after expiry of 5 years of warranty (i.e., 6th, 7th, 8th, 9th and 10th years) in rupees only (and on basis of percentage of price) should be included in a financial bid in the absence of which the offer is liable to be rejected. Payment for CMC/AMC shall be made only after the expiry of the warranty of 5 years, in case the Institute (the purchaser) decides for availing of CMC/AMC services. Contract for CMC/AMC shall be decided on expiry of warranty but rates (not more than 5% inclusive of all taxes for 6th to 10th year) will be frozen at the price of an issued purchase order before the release of payment by the Institute (the purchaser). However, the Institute (the purchaser) may decide not to enter into any CMC/AMC contract without assigning any reason for the same, which shall be binding upon the bid.





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