TECHNICAL SPECIFICATION FOR MEDICAL EQUIPMENT

Equipment: C ARM UNIT

OBJECTIVE

Objective: A C-Arm Fluoroscopy Unit is a state-of-the-art mobile medical imaging system designed to provide high-resolution, real-time X-ray imaging during diagnostic and surgical procedures. It enables clinicians to visualize anatomical structures, implants, and surgical instruments with precision, thereby enhancing procedural accuracy, patient safety, and clinical decision-making. The system is essential for supporting a wide range of specialties, including orthopaedics, trauma, general surgery, urology, vascular surgery, pain management, gastroenterology, and other image-guided interventions. The equipment is intended to improve workflow efficiency, reduce radiation exposure through advanced imaging technologies, and ensure the delivery of high-quality, safe, and effective patient care.

C-ARM X-RAY UNIT – TECHNICAL SPECIFICATIONS

1. X-Ray Generator

Parameter	Specification
Type	High-frequency digital X-ray generator (solid-state inverter)
Output Power	2 kW – 15 kW or higher
Voltage (kV)	40 – 120 kV range
Current (mA)	Fluoroscopy continuous and pulsed modes (approx. 0.1 – 10+ mA continuous, higher in pulse modes)
Pulse Fluoroscopy	Supported with adjustable pulse rates for dose optimization

2. X-Ray Tube

Parameter	Specification
Anode Type	Rotating or stationary anode with single or dual focal spots (~0.3 – 0.6 mm)
Anode Heat Capacity	Suitable for continuous clinical use (tens of kHU or more)
Filtration & Collimation	Motorized or manual collimation with beam filtration for dose optimization

3. Flat Panel Detector

Parameter	Specification
Detector Type	Digital flat panel detector with CsI scintillator and amorphous silicon (a-Si) TFT or CMOS technology
Active Field Size	Approximately 20 × 20 cm to 30 × 30 cm
Pixel Matrix	Minimum ~1024 × 1024
Pixel Size	Approximately 150 – 210 µm
A/D Conversion	≥16-bit
Spatial Resolution	Approximately 2.4 – 2.5 lp/mm or higher
Frame Rate	Real-time fluoroscopy up to 15 – 30 fps

4. Motion & Mechanical

Parameter	Specification
C-Arm Rotation	±180° or greater
Vertical Travel	Approximately 400 mm or more
Horizontal Travel	Approximately 200 mm or more
Orbital / Tilt Range	Approximately 90° – 130°
Source-Detector Distance	Approximately 900 – 1100 mm
C-Arm Free Space / Depth	Approximately 650 – 800 mm

5. Display & Workstation

Parameter	Specification
Live Monitors	High-resolution LCD/LED monitors (dual 19″ – 32″)
User Interface	Touchscreen controls for imaging and system settings
Image Storage	Integrated storage with DICOM 3.0 networking and PACS compatibility

6. Imaging Modes & Software

Parameter	Specification
Fluoroscopy	Continuous and pulsed fluoroscopy with dose modulation
Radiography	Still image radiography using flat panel detector

Image Enhancement	Real-time noise reduction, edge enhancement, zoom, measurement tools
Advanced Features	Road-mapping, DSA, and dose reporting

7. Power & Environment

Parameter	Specification
Power Supply	Standard mains AC (100 – 240 V, 50/60 Hz)
Battery Option	Need battery backup/FOC UPS
Operating Conditions	Suitable for operating room and clinical environments

8. Safety & Compliance

Parameter	Specification
Radiation Protection	Automatic dose control, collimation, anti-scatter grids
Standards Compliance	IEC / FDA / CE safety and performance standards

Additional Tender Requirements

Parameter	Specification
Equipment Qualification	Design, installation, operation and performance qualifications required
Calibration	Reports must be traceable to international standards
Warranty	Minimum 3 years warranty
Service Support	CMC / AMC for next five years with spare parts availability
Product Details	Brand, model, rating, description, specifications, price and quantity must be furnished
Documentation	Catalogues and technical write-ups in English (hard and electronic copies)
Performance Data	Performance and efficiency parameters must be provided
Training	Demonstration and comprehensive training for user and biomedical staff

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