

## TECHNICAL SPECIFICATIONS FOR 64 SLICE CT SCANNER

The system should be latest state of the art, independent 64 or more rows of detectors with acquisition of at least 64 slices per rotation capable of integrating with any PACS/HIS system. The system should be DICOM - ready with true isotropic volume acquisition and sub millimeter resolution. The model quoted should be, US FDA/European CE certified. **The system should be capable of doing ultra low dose imaging using iterative reconstruction technique.** The essential requirements of the system are as follows:-

### **a) Gantry:**

- Aperture: 70 cms or more
- FOV: 50 cms or more
- 3-D laser lights for positioning.

### **b) X-Ray Generator:**

- High Frequency type.
- Power output: **55 kW** or higher
- mA Range: 20-500 mA (With incremental steps of 10 mA)
- KV Range: **80-140** or more

### **c) X-Ray Tube:**

- Tube Voltage: **80-140 kV** or more
- Anode Heat Storage Capacity of at least 5.0 MHU or direct cooling tube

### **d) Patient Table:**

- Load carrying capacity at least of 150 Kg with positional accuracy of 1 mm or less
- Metal free scanable range of 150 cm or more
- Floating table top with foot pedal/hand control for positioning.

### **e) Spiral Acquisition:**

- Scan Time should be **0.5** sec or less for full 360 degree rotation.
- Minimum slice thickness should be **0.675** mm or less.
- Pitch Factor (volume pitch): freely selectable in auto mode and also manually variable between 0.5 to 1.5 or more. Specify all possible pitch selections.
- Bolus Triggered or bolus chase spiral acquisition should be available.
- Real time x-ray dose reduction which combines both Z axis and angular tube current modulation to adjust the dose to the size and shape of individual.

### **f) Image Resolution:**

1. High contrast resolution should be at least 15 lp/cm for axial and spiral scan at 0% MTF with full FOV.
2. Low contrast resolution – 5mm or less at 3.0 HU using 20 cm CATPHAN phantom on 10 mm slice thickness.

### **g) Data Acquisition System:**

- Detector- Capable of acquiring at least 64 slices per 360 degree of rotation.
- At least 64) rows of independent detectors are required with Z-axis coverage of 38 mm or more.
- Solid state or rare earth detectors of latest technology free from repeated calibration.

### **h) Image Reconstruction:**

- High speed real time reconstruction with display matrix of 1024x1024 or more.

- Reconstructed slice thickness should be sub-millimeter to 10mm freely selectable.

**i) Operator Console:**

- High resolution medical grade LCD color monitors of 19" or more.
- Should perform Registration, scheduling, protocol selection, Volume rendering, volume measurements, Multi-planar Reconstruction, and standard evaluation application and all available post processing functions without the help of the satellite workstation.
- Raw Data storage with at least 500 GB Hard disc having image storing capacity of 2,00,000 or more in 512x512 format.
- Auto-voice capability with custom designed key board and mouse.
- Archiving options: CD-R, DVD, should be available. Blue ray data transfer will be preferred. 5000 rewritable DVDs should be provided.

**j) Workstation client server architecture)**

1. It should be a high speed (minimum post-processing frame rate of 16 frames/sec) CPU with a speed of 3.0 GHz or better and with an independent Hard disc storage capacity of 1 TB or more, with 19 inches or more high resolution medical grade colour LCD monitors capable of simultaneously viewing and performing all post processing functions and filming independently without the help of main console.
2. Memory of the workstation should be independent of the console.
3. Two way data transfer between the operator console & the satellite workstation should be automatic and standard.
4. Post Processing Soft-wares
  - (i) Perfusion CT for brain
  - (ii) CT Angio, VRT, MIP, MPR, 3-D Shaded Surface display, Image Fusion, Vessel segmentation, luminal view
  - (iii) Virtual Endoscopy with facility for virtual dissection and computer aided detection of polyps.
  - (iv) Advanced cardiac package including Coronary Artery Imaging, Calcium Scoring, Myocardial Viability software, Cardiac functional analysis and advanced Vessel Analysis including stenosis assessment. Facility for prospective and retrospective ECG editing, facility for automatic selection of rotation speed according to heart beat and step and shoot for low dose acquisition should be available
  - (v) Automatic bone Removal facility.
  - (vi) Dental CT.
  - (vii) Lung nodule evaluation software.
  - (viii) DSA
5. Interactive & Automatic Cine display should be available.
6. Image Evaluation Tools:
  - (i) Parallel evaluation of multiple ROI in circle, irregular and Polygonal forms,
  - (ii) Statistical Evaluation for area/ volume, S.D, Mean/Max and Histograms.
  - (iii) Distance & angle measurement, freely selectable, positioning of co-ordinate system, grid and image annotation.

**k) Patient communication system:**

1. An integrated intercom and Automated Patient Instruction System (API) should be provided.
2. One closed circuit TV for patient monitoring.

**l) Dry Chemistry Laser Imager:**

1. Resolution: 16 bits/ 500 dpi or more with minimum three ports (Single tray).
2. Support Multiple Film Sizes: one of which must be 17"x14".
3. DICOM 3.0 Compatible.

**n) System Configuration Accessories, spares and consumables:**

- Collapsible wheel chair with rubberized swivel wheels - 01 nos.
- Standard Patient positioning accessories and restraining devices - 02 sets.
- Light weight Lead Aprons "0.25" lead equivalence - 3 Nos. Gonadal shields – 2 Nos, Thyroid shields – 3 Nos and Lead goggles – 2 Nos.
- Lead Glass 100 cm x 150 cm of 2 mm Lead equivalence as per the requirement of the equipment. As per AERB recommendations
- 120 KVA Online UPS of suitable rating should be supplied for the complete system including Gantry, computer system, with at least 30 minutes back up.
- Dual Head Pressure Injector with 700 syringes of 200 ml.
- Software for Remote Diagnostics Service over a telephone line.
- System must be PACS, HIS/RIS interface ready without any new hardware or software.
- A free comprehensive software **update** guarantee for entire life of scanner must be provided.
- Comprehensive Maintenance Contract for next eight years including all the accessories, Air conditioning and CT tube and all major consumables.
  
- Warranty: 24 months from the date of satisfactory installation. The warranty shall cover all the accessories including CT tube and all major consumables.
- Centralized oxygen facility for both CT (to be connected to the nearest port) in gantry and recovery room. **Sucker machine, pulse oxymeter, intubation sets (standard resuscitation accessories )**
- One latest all-in-one desktop computer with printer latest specifications ( for reporting & teleradiology) to be provided.
  
- **Real time CT Fluoroscopy** with at least 6 to 8 frames per second with dedicated 19 inches color LCD monitor. Facility table side controls and foot switch for biopsy to be quoted separately.

**q) Instructions to the vendors/suppliers:** All companies must give product data sheets confirming the specifications along with the tender. ***The compliance statement must be filled strictly under the heading given in the tender.*** Each specification corroborated in the compliance statement must give the page number where it is listed in the product data sheet. Incompletely filled information will not be considered.

**r) Penalty:** Rs.10,000 per day (rupees ten thousand) or **downtime conversion to extended warranty @2 days for every single day of downtime.**

**s) Training of CT :** On-Site training to be provided for three months (at 4 weeks interval). Off-Site training in the country in a reputed teaching hospital for 4 weeks for two doctors.