

16 Slices CT Scan Machine		Fill Your Specifications
CT Scan	Multi Slice Spiral CT Scanner for high resolution whole body scanning including vascular application. The system should be capable of acquiring 16 slices per rotation. Latest slip ring technology. True isotropic volume acquisition and submillimetric resolution.	
CT Procedure	Contrast Media Tracking	
	CT Angiography	
	CT Pulmonary Angiography	
	CT Fluoroscopy for Biopsy	
	Advances 3D analysis	
	Dynamic cerebral perfusion mapping	
	Head CT	
	Thoracic CT	
	Abdominal CT	
	Pelvic CT	
	Skeletal CT	
Interventional CT		
Gantry	Aperture ≥ 70 cm	
	Control Panel: on either side	
	Positioning Lights.	
	FOV ≥ 50 cm	
	Tilt-Remote $\geq \pm 30$ deg	
X Ray Generator	High Frequency type	
	Power output ≥ 60 KW	
	mA Range : up to 500 mA (With incremental steps of 10 mA)	
Spiral CT	Scan Time ≤ 0.5 Sec for full 360 deg rotation.	
	Min slice thickness ≤ 0.625 mm	
	Max slice thickness ≤ 10 mm	
	Slice increment.-specify scan and selectable slice thickness	
	Pitch Factor (volume pitch): variable between 0.5 sec to 2 sec or more and should be user selectable. Specify all possible pitch selections.	
	Single Continuous spiral on time should be at least 100 sec.	
	Should optimize radiation dose and resolution for each selection.	
	Bolus Triggered Spiral acquisition should be possible.	
	Facility of multi-spiral, bi-directional spirals and back to back spirals.	

Tube	Tube current : up to 500mA	
	Real Time mA modulation for dose regulation.	
	Tube Voltage: 60-140 KV	
	Anode Heat Storage Capacity- should be 8 MHU or more	
	Anode Temp Monitoring System.	
	Heat Dissipation: $\geq 800\text{KHU/minute}$	
	Filter and beam limiting devices:	
	Smaller Focal Spot size and number	
	The tube should have dynamic focal spots.	
	The X-ray cooling unit should be inbuilt in the gantry	
PATIENT TABLE	Minimum Load capacity of at least 200Kg with 1 mm positioning accuracy.	
	Table speed Horizontal $\geq 100\text{ mm/sec}$.	
	Vertical Table travel= 50mm/sec	
	Minimum table top height should be 55cm or less from the ground level for easy transportation of trauma patient.	
	Longitudinal Scan Range: at least 130cm or more	
	Manual movement of the table should be possible in case of power failure.	
	Reproducing positional accuracy should be mentioned.	
	Remote Up/Down and forward /backward should be standard.	
	Facility of positioning aid for horizontal isocentric positioning of the patient.	
	Carbon Fibre Table Top.	
TOPOGRAM	Length and width: Specify the range	
	Scan Time: Specify the range	
	Views: Frontal & lateral views.	
	Should be able to interrupt acquisitions manually once the desired anatomy is obtained	
Data Acquisition System	Detector- Capable acquiring 16 slices per 360 deg of rotation.	
	Total effective length of detector array at isocenter should be 20 mm .	
	Inbuilt mechanism for adapting the tube current during each scan this should enable radiation dosage reduction where body part thickness is less.	
	Detector system should not require frequent calibration.	
	Inbuilt pediatric protocols.	

IMAGE RECONSTRUCTION:	Real Time reconstruction speed: 5 images per sec or more at 512x512 matrix.	
	Display Matrix: >=1024x1024	
	Reconstructed slice thickness: 1mm- 10mm. freelyselectable Scan Field and reconstructed field	
MONITORS	Pixel Size < 0.3 mm.	
	Two Flat screen medical grade of at least 19" with fast image refresh rate should be fast and preferably instantaneous and flicker free.	
	Should be non interlaced and progressive display type & sturdy	
Operator Console	Should perform Registration, scheduling, protocol selection , volume rendering, Volume measurements, Multiplanner Reconstruction, and standard evaluation application and all available post processing functions without the help of the satellite workstation as well as film exposure.	
	Raw Data storage with at least 800 GB Hard disc having a minimum of 200,000 image storing capacity in 512x512 format.	
	An independent satellite workstation with Hard Disc of 800GB or more , capable of simultaneous viewing of all post processing functions and filming independently without the help of main console .Data transfer between the operator console & the satellite workstation should be instantaneous	
	Additional fully functional independent workstation of similar capability as satellite workstation should be installed in Radiology department.	
Image Evaluation Tools	Parallel evaluation of multiple ROI in circle, irregular and polygonal forms.	
	Statistical Evaluation for area/ volume, S.D, Mean/Max and Histograms.	
	Profile cuts: horizontal, vertical and oblique views.	
	Distance & angle measurement, freely selectable positioning of co-ordinate system, grid and image annotation.	
	Dynamic evaluation of contrast enhancement in organs and tissues, calculation of time-density, curves, peak enhancement images and time-to-peak images.	

Post processing tools	2-D, including image zoom and pan, image manipulations, including averaging, reversal of grey-scale values, and mirroring; image filter functions, including advanced smoothing algorithm and advanced bone correction.	
	Real-time multi-planar reconstruction (MPR) of secondary views, with viewing perspectives in all planes including curved & orthogonal MPR	
	Standard 3D applications: CT angiography, MIP, MinIP, SSD, VRT, and other advanced 3D applications and color coding for different tissues.	
	3D images for CT guided biopsy, 3D virtual endoscopy, colonoscopy, bronchoscope should be possible.	
	DSA and advanced neurological imaging packages should be provided.	
	Spatial alignment and visualization of two different data sets of one patient generated on different modalities or with different acquisition times. -	
	Perfusion CT for study of brain. Liver, kidney, pancreas etc.	
	Volume measurements.	
	Fusion of morphological data obtained on <i>CT</i> , <i>MR</i> or <i>DSA</i> .	
Patient communication system	An integrated intercom and Automated Patient Instruction System (API) should be provided	
Image quality	Low contrast resolution - specify low contrast resolution of 5mm with 20cm CATPHAN phantom.	
	Specify High contrast resolution at 15 lp/cm or higher 0%and 10% with full FOV.	
	Specify Cross-field homogeneity	
Image documentation	A.Dry View Imaging Camera with the following specifications:	
	Dry Laser Technology	
	Resolution :12 bits/ 500 dpi	
	Supports 5 Multiple Film Sizes: one of which must be 17"x14"	
	Must have 3 or more online film tray sizes.	
DICOM Compatible Attach conformance statement.		

Image documentation	B. State of the art Laser color printer:	
	Color Dry Printer for printing Film Quality Images on plain paper.	
	DICOM Compliant	
	Laser/Thermal Dye Sublimation Technology for B/W or Color Printing	
	Resolution- 1200x1200 dpi. More than 20 ppm.	
ARCHIVAL	Archiving: DVD/CD writer should be provided for archival. Specify minimum number of uncompressed and compressed images that it can store per disc. Option of viewing these discs on any PC without DICOM viewer should be available.	
Upgradeability	Software upgrades that enhance existing applications must be provided by the vendor indefinitely at no cost to the purchaser. These no charge upgrades shall include any circuit boards or parts if software is added to enhance existing capabilities.	
	System should have capability to being upgraded as new technology emerges for at least 7-10years	
	Additional or new software must have the capability of being downloaded by remote computer access. Software must include a free trial period before purchase.	
Power Supply	Power input to be 220-240VAC, 50Hz /415 V 3 Phase.	
	Resettable over current breaker shall be fitted for protection	
	On line UPS of suitable rating of 30 min backup shall be supplied for the complete system including computer system.	
System configuration Accessories, spares and consumables	Good quality light weight vinyl Lead Aprons of 0.5mm lead equivalent : 4 nos	
	Lead Glass 150x100cmx 2mm lead : 1nos	
	Double rows LED view boxes 4 in each row : 2nos	
	Examination room shield should be with respect to SAEC regulations	

Standards and safety	Should be US FDA or CE (from notified body) approved CT Scan	
	Electrical safety conforms to standards for electrical safety IEC-60601	
	Lead Glass window as per room requirement	
	Safety aspects of Radiation dosage leakage should be spelt out	
	Should comply with SAEC Guidelines for radiation leakage	
	Training for two radiologists, two technicians and two biomedical engineers. Radiologists to be trained for clinical whereas the technicians and biomedical engineers to be trained for operation and maintenance (professional service)of the unit.	
	Specify the year of launch of the particular model.	
	Site preparation requirements should be held by the bidder.	
Dual head Pressure Injector with the following: CE (from notified body)	Flow rate -0.1-10 ml/sec, Volume- 1 ml to syringe capacity, programmable pressure limit of 325 psi with 200 ml disposable sterile syringes. Syringe heater range 35 deg C+/- 5 deg	
	C. Should be provided with head mounting device and integral IV pole.	
	100 no's syringes with tubing's to be provide with the machine.	
	Unit will be provided with display monitor to provide Pressure Monitor graph, Flow Profile, Stop Watch Feature, Scan Display, multiphase capability and protocol locking capabilities.	
Warranty	Two years comprehensive onsite warranty for entire CT system after commissioning.	
	Availability of spare parts for minimum (10) years.	
	Spare parts and consumables price list	
Documentation	User manual in English incorporating the newer applications.	
	Service manual in English	
	Assembly manual	
	Log book with instruction for daily, weekly, monthly and quarterly maintenance checklist.	
	The job description of the hospital technician and company service engineer should be clearly spelt out	
Spare parts and consumables part number list.		