S.N.	Technical spec from IIT Madras, Chennai
1	**MICRO & NANO Sources Integrated into a single system X-ray Sources (Dual open tube with MICRO Focal 240kv/320W & Nano Focal 180kv/15W tubes)**
1.1	**240 KV micro focus x-ray tube**
1.1 (a)	Tube voltage up to 240KV
1.1 (b)	output up to 320W
1.1 (c)	Min Focal Spot < 6 micron
1.1 (d)	Target: Tungsten
1.1 (e)	Beam centering automatic
1.1 (f)	Beam focusing automatic
1.1 (g)	Control with embedded controller with GUI software
1.1 (h)	Detailed detectability 1 micron
1.2	**180KV nanofocus x-ray tube**
1.2 (a)	Tube voltage up to 180KV
1.2 (b)	Output up to 15W
1.2 (c)	Min focal spot < 1 micron
1.2 (d)	Target of Tunsten with diamond window
1.2 (e)	Automatic beam centering
1.2 (f)	automatic beam focusing
1.2 (g)	Control with embedded controller with GUI software
1.2 (h)	Detailed detectability 200 nm
2	**Object Manipulator**
2.1	Features 5, axis, optimized metal construction
2.2	Maximum sample diameter 250mm or better
2.3	maximum sample height 420mm or better
2.4	maximum sample weight 10kg or better
2.5 (a)	Travel paths x-axis 300mm
2.5(b)	Travel paths y-axis 420mm
2.5 (c)	Travel paths z-axis 545mm
2.5(d)	Travel paths rotation 360 degree
2.50 €	Travel paths tilt +/- 45 degree
2.6	Control using joystick and software
2.7	Precision of rotation axis < 2 micron
3	**Detector**
3.1	Features: temperature stabilized flat panel detector
3.2	pixel size 200 micron x 200 micron
3.3	Sensitive surface 200 mm x 200 mm approx
3.4	Sensitive surface with IMR 400mmx200mm approx
3.5	Size of 1024x1024 pixel
3.6	Size with IMR is 2048x1024 pixel
3.7	Grey scale resolution: 14bits or better
3.8	Frame rate upto 30 FPS, Image lag <0.8% per ASTM E2597/07
3.9	Control with full integration with x-ray operating system
4	**Control unit**
4.1	Features should be able to control all hardware components
4.2	Controller should be dual / quad core based
4.3	Display with 24" TFT
4.4	RAM 4GB or better

4.5	LAN with Gigabit interface
4.6	Operating system windows XP or better
5	**Reconstruction & visualization unit**
5.4.1	Controller with multicore & multiprocessor based
5.4.2	RAM 96 GB
5.4.3	Storage with 4 & 1 TB HDD
5.4.4	LAN with 2 Gigabit interface
5.4.5	Operating systemWin 7 ultimate (64 bit) or better
5.4.6	Drive: DVD RW
5.4.7	Graphic processor: High end optimized for VGstudio & accelerated CT reconstruction (velo CT II)
6	**Software**
6.1	Data Processing Software including veloCT, agc, bhc+, rar, scan-optimiser, multiscan, mx-reco, quality assurance,VG Studio Max (64 bit) modules comprising of following minimum features
6.1.a	Control all components ie tube, detector & manipulator
6.1.b	Integrated data aqusition, reconstruction , visualization& analysis
6.1.c	Volume recontruction using GPU enabled fast computing
6.1.d	Visualization features of orthogonal viewing, zooming, interpolation, 3-d rendering
6.1.e	Image processing functions on aquired data & reconstructed slices/volumes
6.1.f	Automatic geomety calibration
6.1.g	Beam hardening correction
6.1.h	Ring artifact reduction
6.1.i	Region of interest scanning
6.1.j	Automatic optimization of CT scans eg balancing drifts, image quality analysis
6.1.k	Automated image acquisition & reconstruction of multiple scans
6.1.l	Automated piecewise reconstruction of large volumes
6.1.m	Image quality assurace with automated test sequences
6.1.n	Measurement, result file creation & CT image savings in BMP/JPEG/TIFF
6.1.o	Fast scanning option without sample stoppage for each projections
6.1.p	3-D visualization with pseudo color rendering, sectional, viewing & animation
6.1.q	Surface extraction capaility to point cloud (xyz) & polygon mesh (stl) files
7	**Additional Features**
7.1	System to be housed in Radiation shielded cabinet with radiation dose < 1 micro Sv/hr measured 10 cm from the cabinet wall
7.2	System electrical connection: 230V AC, Single Phase, 2300VA
7.3	Spare plug-in cathodes, consumables (fuses gascates to be provided)
7.4	All system documentation & manuals for operation & maintanance to be provided
7.5	High resolution rotation unit for nano CT package & dimond window for nano focus tube has to be provided
7.7	Installation & training to be provided at site
7.7	Minimum of one year warranty & spare support for minimum 10 years