## TECHNICAL SPECIFICATIONS OF C-ARM MACHINE

Following are the minimum requirements. Products offered must meet these parameters herein.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Technical specifications/ composition of tender enquiry</th>
<th>Compliance on each parameter with detailed substantiation how the offered product meets the requirement. (Simply writing as YES/Complied/As per BIS/CE/ISO terms is not allowed)</th>
<th>Remarks, if any</th>
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<tr>
<td>1.</td>
<td><strong>Mechanical motion requirements for C-Arm:</strong></td>
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<td>a. Motorized Vertical travel: Minimum 400 mm or more</td>
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<td>b. Horizontal travel: 220 mm or better</td>
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<td>C. Rotation of C-arm: +/- 270 deg. or more</td>
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<td>d. Pivotal rotation: 12.5 deg. or more</td>
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<td>e. Orbital rotation: minimum 120 deg. (90 deg. to minimum -30 deg.) or better</td>
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<td>f. Depth / Radius of C-arm: 650 mm or better</td>
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<td>g. Free space between Image Intensifier &amp; X-ray tube:</td>
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<td>Minimum 750 mm or more</td>
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<td>h. Source to Image intensifier distance (SID): 880 mm or more</td>
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<td>j. Total width of C-arm: Maximum 800 mm or less</td>
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<td>Collimator:- Iris Collimator</td>
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<td>3.</td>
<td>The C-arm should have facility of locking the C-arm movements with easy to turn handle on control unit. Rear wheels must be freely movable for easy to turn handle on control unit. Rear wheels must be freely movable for easy positioning of the complete C-arm around the OT table.</td>
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<td>4.</td>
<td>Image Intensifier should have at least triple field 9” input diameter offering resolution and contrast ratio (25:1 or better)</td>
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<td>5.</td>
<td>TV Camera: Ultra Compact CCD camera or camera with CMOS or advanced CMOS sensor with high No of pixels (&gt; 450000) and video band width (at least 20 MHz of better) along with 2 Nos. Medical grade 17” or more 625 lines 100 Hz flicker free TV monitors on separate</td>
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monitor trolley with facility to rotate the image continuously.

6. Direct Radiography: Radiography should be possible on a cassette to be fitted in a holder for 10X 12 inches cassette. The unit should be complete with one such holder and 1 No. cassettes including high speed intensifying screens.

7. X-ray generator: High frequency (> 14KHz) at least 1.9 KW or even better X-ray generator with high capacity rotating anode X-ray tube of dual foci of 0.3 and 0.6 mm.

8. Fluoroscopy output: 40-120 KV in 1 KV steps

9. MA output: Minimum upto 8.0 mA or better

10. Snapshot: Minimum 12.0 mA or better

11. Fluoroscopy rate selectable: 1 image per second to 1 image per 5 second or better

12. Automatic dose rate regulation with KV & mV control

13. Time totaler for fluoroscopy with facility for alarm after every 5 minutes of fluoroscopy

14. Radiography output: 40-120 KV in 1 KV steps

15. mA range: Up to 250 mA or better

16. mA max: Up to 90 mA or better

17. **Image Memory:**
   - At least 1 (LIH) + minimum 20,000 frames dynamic digital memory on Hard Disk with 1024 X 1024 matrix or better.
   - There should be facility to insert patient name through alpha-numeric key board. The system preferably must be upgradable for performing real time digital subtraction angiography with acquisition up to 6 frames/sec. or better and road mapping functions etc. at any later date for peripheral angiography.

18. **Image processing:**
   - The system should have automatic dose level selection.
   - It should preferably have automatic image parameter selection with capability of switching on to manual selection.
   - Image storage of 20,000 images on a 1024 / 1024 matrix
   - It should have image annotation facility; measuring of distances and angles, entering of demographic data of patients, support of DICOM 3.0 functions.
   - Image processing must be a fully digital continuous chain of at least 1k / 1k matrix for image acquisition, processing , storage, archiving and documentation. The system should allow configuration and linking up with the HIS (Hospital information system).
f. Automatic KV and mA technique selection and manual mode.

g. Image Vertical and horizontal reversal should be possible on the LH image after fluoroscopy.

h. Should have 2x and 3x zoom function.

19. **Essential Accessories:** The complete functional system must be quoted with dual channel Laser light source on X-ray tube unit for making a cross to reduce the X-ray dose, built in diode area product meter for display of X-ray dose, light weight lead aprons (12), thyroid shields (12), gonadal shields (12), lead goggles (5) and preferably a CVT and thermal imaging film printer with 12 film rolls and a CD/DVD writer.

20. Two sets of sterile drape for the X-ray tube assembly, image intensifier and C-arm.

21. **Power Requirements:**

   a. Single Phase, 230V AC, 50Hz.

   b. Suitable Stabilizer should be provided along with the unit.

22. **LCD Camera with full 180 Clock wise and Anti Clockwise rotation.**

23. Foot operated backup system on large wheel.

24. Should generate Error code for troubleshooting.

25. **Warranty:**

   Company should provide comprehensive maintenance warranty of 2 years followed by 5 Yrs. CMC included.

26. **Standards, safety and training:**

   a. **The System should have CE (Should be from Notified Body)/ US FDA Approval.**

   b. The Equipment should be AERB approved and should submit documentation for the same.

   c. The unit shall be capable of being stored continuously in ambient temperature of 0 -50 deg. C and relative humidity of 15-90%.

   d. The unit shall be capable of operating in ambient temperature of 20-30 deg C and relative humidity of less than 70%.

   e. Should provide training to end users.

   f. **User/Technical/Maintenance manuals to be supplied in English.**

   g. The responsiveness of the bid will be based on successful demonstration of quoted model.