



SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
	IMP: The technical compliance sheets shall be filled with full technical details. If any clause is not supported by technical details the offer will not be considered.				
1	<b>PURPOSE: (Operations/Jobs involved): Rotation of Jobs up to 80 Ton at various angles as required by job geometry and at various prespecified RPM.</b>	Vendor to Confirm			
2	<b>SPECIFICATION:</b>				
2.1	Load Capacity: 80 ton at 90 ° tilt (Positioner face plate vertical and Job axis Horizontal)	Vendor to Confirm			
2.2	Load Capacity at various angles of tilt. Chart to be provided by vendor	Vendor to Specify			
2.3	Load capacity at overhang / center of gravity at 1500 mm (approx): 60 Ton at 90 ° tilt	Vendor to Confirm with mathematical calculations and also explain how to safely hold the job on the face plate.			
2.4	Load capacity at various offcenter / eccentricity. Chart to be provided by vendor	Vendor to Specify with full mathematical calculations and how they will achieve it in the job.			
2.5	Rotational Speed range of Table: 0.005 - 0.5 (or more) RPM	Vendor to specify and confirm			
2.6	Tilt: 135 ° (Tilt angle protractor to be provided)	Vendor to specify and confirm			
2.7	Time taken to tilt at 135° with Full Load and No Load	Vendor to specify			
2.8	Table Size Dia with / without Extension arms: ≥ 5000 mm. Complete details of extension arm (if any) must be given by Vendor. Extension arm system must be strong enough to carry full load	Vendor to Confirm			

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2.9	Overall height of table when positioner face plate horizontal and Job axis Vertical : Max. 3000 mm approx	Vendor to Confirm			
2.10	Degree of table rotation on vertical axis - 360°	Vendor to Confirm			
2.11	Table should be with concentric circular marking for rapid centering and clamping of work pieces.	Vendor to specify and confirm (S & C)			
2.12	Table equipped with efficient built in earthing for 2000 A and carried on large diameter pre loaded cross roll bearing.	Vendor to S & C			
2.13	No of T -Slots on Face plate: ≥ 8. Size sufficient to take care of job weight and its bending moment	Vendor to S & C			
2.14	General Assembly Drawing with Technical Specifications and all mathematical calculations to be attached with offer.	Vendor to S & C			
2.15	Suitable bottom support for supporting free end of rotating cylindrical and conical jobs.	Vendor to S & C			
<b>3</b>	<b>Motors for Rotation / Tilting</b>				
3.1	Type: AC Vector motor	Vendor to S & C			
3.2	Make and Model: Siemens / ABB / Fanuc / Hitachi / Crompton	Vendor to S & C			
3.3	Capacity and Rating of Motor	Vendor to S & C			
3.4	Controller for Motor: AC Vector drive of Fanuc / Siemens / ABB / Schneider / Yashakawa / Panasonic make only	Vendor to S & C			
<b>4</b>	<b>Operation &amp; Control System: All the controls, switchgear and drive of the turn table rotator shall be housed in a compact IP42 grade enclosure of RITTAL make.</b>	Vendor to S & C			

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4.1	Operational Control at Control Panel.				
4.1.1	Power On-Off switch with indication lamp.	Vendor to S&C			
4.1.2	Local / Remote selector switch	Vendor to S&C			
4.1.3	Start / stop switch for Rotation	Vendor to S&C			
4.1.4	Selector Switch for rotation in clockwise and anticlockwise direction.	Vendor to S&C			
4.1.5	Display system with proper feedback device of Heidenhain / Seimens make for RPM and tilting angle.	Vendor to S&C			
4.1.6	Rotational speed control with Speed infinitely variable in full range.	Vendor to S&C			
4.1.7	Inching of rotation	Vendor to S&C			
4.1.8	Switch for tilting forward reverse of positioner at specified angle	Vendor to S&C			
4.1.9	Emergency Stop Switch	Vendor to S&C			
4.1.10	Equipment should be equipped with Overload protection and indication.	Vendor to S&C			
4.1.11	PLC (if any) of Siemens / Allen Bradley / Telemechanique / Fanuc make only to be used.	Vendor to S&C			
4.1.12	The control panel should be properly concealed and insulated to avoid any earthing fault.	Vendor to S&C			
4.2	Dust tight Remote control pendant: The length of cable connecting the main panel shall be at least 10 M long. The cable shall be housed in heavy duty metallic conduit with PVC sheath of LAPP / Finolux / RARA make. It shall have following controls:	Vendor to S&C			

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4.2.1	Start stop switch for Rotation	Vendor to S&C			
4.2.2	Selector Switch for rotation in clockwise and anticlockwise direction.	Vendor to S&C			
4.2.3	Rotational speed control with Speed infinitely variable in full range.	Vendor to S&C			
4.2.4	Inching of rotation	Vendor to S&C			
4.2.5	Switch for tilting forward reverse of positioner at specified angle	Vendor to S&C			
4.2.6	Emergency Stop Switch	Vendor to S&C			
5	<b>CONSTRUCTION:</b>				
5.1	Vendor to furnish details of material, hardness & constructional details, including explanatory drawings, of various components/assemblies of the machine. Test certificate of the material used to be provided. Vendor to furnish constructional details like thickness etc of structure and top bed plate along with the offer	Vendor to S&C			
5.2	The Positioner will be used for Arc Welding. The bearings and gears should also be suitably protected to avoid ingress of flux, slag etc. The bearings shall be self lubricated.	Vendor to S&C			
5.3	Make of all bearings: SKF / NBC / INA/NRB / FAG / TIMKEN make.	Vendor to S&C			
5.4	Gear box should be of Radicon / Elecon / Shanti Coimbatore / Bonfiglioli Chennai make.	Vendor to S&C			
5.5	The Positioner including all the bearings gears etc to be made suitably to withstand temperature of 250 ° C, which may occur due to welding or preheating for long hrs. The bed plate should be of sufficient thickness to withstand 80 Ton load and should not warp at 250 ° C temperature.	Vendor to S&C			

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5.6	The Positioner to be designed for portability, which might be necessary for shifting the Positioner at different places in the shop. Adequate clamping arrangement to be provided for the purpose.	Vendor to S&C			
5.7	Video images in soft copy explaining the technical features / Literature with photographs, drawings explaining the technical features should be enclosed with the offer	Vendor to S&C			
6	<b>ELECTRICAL SYSTEM :</b>				
6.1	415V $\pm 10\%$ , 50HZ $\pm 3\%$ , 3 Phase AC (3 wire system with out neutral) Power Supply Source will be provided by BHEL at a single point near the positioner, as per layout recommended by Vendor. All types of cables, connections, circuit breakers etc. required for connecting BHEL's power supply point to different parts of the positioner/control cabinets, shall be the responsibility of vendor.	Vendor to S&C			
6.2	All electrical & electronic control cabinets, bearings, gear box, & motors etc. should be dust, heat and vermin proof	Vendor to S&C			
6.3	Motors shall conform to IEC / equivalent International standard / Indian Standards	Vendor to S&C			
6.4	Vendor should ensure the proper earthing for equipment and its peripherals.	Vendor to S&C			
6.5	All Cables should be of LAPP / Finolex / RARA make	Vendor to S&C			
7	<b>Safety / environmental protection is required for the equipment.</b>	Vendor to S&C			

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<b>8</b>	<b>LEVELING &amp; ANCHORING SYSTEM</b>				
8.1	Complete anchoring system including foundation bolts, anchoring materials, fixators, levelling shoes etc shall be supplied for the positioner.	Vendor to S&C			
<b>9</b>	<b>ACCESSORIES:</b>				
9.1	Clamping tools (T- Bolts) capable to hold jobs of 500 mm thickness and 80 Ton weight to be supplied along with Positioner. Methods of clamping for heavy cylindrical jobs with extended CG about 1.5M from plate shall be explained.	Vendor to S&C			
	Tool kit along with Torque Wrench, spanners, grease guns etc. for operation and maintenance of the machine should be supplied. List of such tools should be submitted with offer	Vendor to S&C			
9.2	Accessories if any recommended by vendor for better functioning of equipment.	Vendor to S&C			
<b>10</b>	<b>SPARES:</b>				
10.1	Unit price list for itemised breakup of mechanical, electrical and electronic spares used on the positioner in sufficient quantity as per recommendation of Vendor for 2 years of trouble free operation on three shifts continuous running basis should be offered by vendor. The list to include following, in addition to other recommended spares: (Unit Price of each item of spare should be offered)	Vendor to S&C			
10.2	All types of spares for total positioner and accessories should be available for at least ten years after supply of the positioner. If positioner or control is likely to become obsolete in this period, the vendor should inform BHEL sufficiently in advance and provide drawings of parts / details of spares & suppliers to enable BHEL to procure these in advance, if required	Vendor to S&C			

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10.3	Recommended set of spares for all attachments are to be offered with details.	Vendor to S&C			
10.4	Vendor to confirm that complete list of spares for positioner and accessories, along with specification / type / model, name & address of the spare supplier shall be furnished along with documentation to be supplied with the positioner	Vendor to S&C			
11	<b>DOCUMENTATION : Five sets of following documents (Original Hard copies) in English language should be supplied along with the positioner</b>	Vendor to confirm			
11.1	Operating manuals of positioner.	Vendor to confirm			
11.2	Detailed Maintenance manual of positioner with all drawings of positioner assemblies/sub-assemblies/parts including electrical diagrams. All Assembly/ Sub Assembly Drawings shall be supplied with the part list also	Vendor to confirm			
	Details of lubrication to be provided.	Vendor to confirm			
11.3	Catalogues, O&M Manuals of all bought out items and supplied accessories including drawings, wherever applicable.	Vendor to confirm			
11.4	Complete Master List of parts used in the positioner shall be submitted by the vendor	Vendor to confirm			
11.5	One additional set of all the above documentation in soft copy with all details and drawing wherever possible.	Vendor to confirm			



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12	<b>ERECTION &amp; COMMISSIONING</b>				
12.1	Supplier to take full responsibility for carrying out the erection, start up, testing of positioner, it's control system & all types of other supplied equipment.. Service requirement like power, air, shall be provided by BHEL at only one point to be indicated by supplier in advance. Other requirements like crane and helping personnel shall also be provided by BHEL. Details of these requirements should be informed by vendor in advance.	Vendor to confirm			
12.2	Successful proving of BHEL components by the supplier shall be considered as part of commissioning. All tests, as mentioned at clause 14 (positioner Acceptance) shall form part of the commissioning activity.	Vendor to confirm			
12.3	Tools, instruments and other necessary equipment required to carry out all above activities should be brought by the supplier.	Vendor to confirm			
12.4	Charges, duration, terms & conditions for E&C should be furnished in detail separately by vendor along with offer.	Vendor to confirm			

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<b>13</b>	<b>AMBIENT CONDITIONS &amp; THERMAL STABILITY :</b>				
13.1	Total positioner including all system and all supplied items should continuously work trouble free and efficiently under following operating conditions and should give specified accuracies. Ambient Relative Humidity = Conditions: Temperature = 5 to 50 degree Celsius 95% max. (Vendor to confirm that positioner is suitable for above and details of provisions on the positioner for the same are to be furnished by Vendor)	Vendor to confirm			
<b>14</b>	<b>Positioner ACCEPTANCE: (Tests/Activities To be Performed by Vendor)</b>	Vendor to accept & confirm			
<b>14.1</b>	<b>Tests/Activities should be carried out at supplier's works on the positioner before dispatch :</b>				
14.1.1	The positioner should be tested for continuous running at 8 hrs at various speeds.	Vendor to confirm			
14.1.2	Demonstration of all operational features of the positioner, and all accessories.	Vendor to confirm			
<b>14.2</b>	<b>Test to be carried out at BHEL works while commissioning the positioner</b>	Vendor to confirm			
14.2.1	Demonstration of all features of the positioner & all accessories to the satisfaction of BHEL.	Vendor to confirm			
14.2.2	Demonstration by actual use of all supplied attachments and accessories to their full capacity.	Vendor to confirm			
14.2.3	On Job prove out and one week independent operation of positioner by BHEL after job prove out.	Vendor to confirm			

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14.2.5	Training of BHEL operators and maintenance personnel in operation / maintenance of complete positioner & accessories etc by the supplier's experts / engineers during their stay at BHEL works	Vendor to confirm			
15	<b>PACKING: Sea worthy &amp; rigid packing for all items of complete positioner, all Accessories and other supplied items to avoid any damage/loss in transit.</b>	Vendor to confirm			
16	<b>Warranty: 24 months for the positioner from the date of acceptance of the positioner.</b>	Vendor to confirm			
17	<b>GENERAL : The vendor should submit the following information:</b>				
17.1	Floor area required (Length, Width, Height) for complete positioner & accessories	Vendor to S & C			
17.2	Total weight of the positioner	Vendor to S & C			
17.3	Vendor to submit, along with offer, the reference list of customers where similar positioners have been supplied mentioning the customer, positioner Model, major specifications of the supplied positioner, Year of Supply etc	Vendor to S & C			
17.4	Detailed catalogues , sketch/ photographs of the m/c and accessories/ attachments should be submitted with the offer.	Vendor to S & C			
17.5	In case of dealers, the dealer shall quote for a single best manufacturer (not offer us different manufacturers to select the best among them) and shall be his successful agent for min. 1 year. He shall have dealt with min. 2 such machines in the past and shall have sufficient trained staff to handle the supplied machine and attend the breakdown calls in the period of 24 hours and shall also maintain necessary spares.	Vendor to S & C with full details and testimonials			

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<b>18</b>	<b>QUALIFYING CONDITIONS :</b>				
18.1	Only those vendors who have been supplied Positioners of atleast min. 50 tons capacity to at least one customers in the past ten years of capacity as per clause 2.3 and such machines are presently working satisfactorily for more than one years after commissioning shall quote. The following information is to be submitted by the vendor about the companies where similar machines have been supplied.	Vendor to S & C			
18.1.1	Name of the customer / company where similar machine is installed.	Vendor to S & C			
18.1.2	Complete postal address of the customer.	Vendor to S & C			
18.1.3	Year of commissioning.	Vendor to S & C			
18.1.4	Application for which the machine is supplied.	Vendor to S & C			
18.1.5	Name and designation of the contact person of the customer.	Vendor to S & C			
18.1.6	Phone, FAX no. and email address of the contact person of the customer.	Vendor to S & C			
18.1.7	Performance certificate from any one customer regarding satisfactory performance of bed plates supplied to them. The certificate to be issued within one year of issue of tender	Vendor to S & C			
18.1.8	BHEL reserves the right to verify information provided by vendor. In case the information provided by vendor is found to be false/incorrect, the offer shall be rejected.	Vendor to S & C			