



An ISO 9001
Company

Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

ENQUIRY	Phone: +91 431 257 76 53 Fax : +91 431 252 00 31 Email : skaruna@bheltry.co.in Web : www.bhel.com
NOTICE INVITING TENDER	

TWO PART BID Tender to be submitted in two Parts	Enquiry Number: 2621300070	Enquiry Date: 06.12.2013	Due date for submission of quotation: 24.01.2014
<p>You are requested to quote the Enquiry number date and due date in all your correspondence. This is only a request for quotation and not an order.</p> <p>Please note that under any circumstances both delayed offer and late offers will not be considered. Hence vendors are requested to ensure that the offer is reaching physically our office before 14.00 hrs on the Date of tender opening.</p>			

Item	Description	Quantity	Delivery Required	Delivery Terms Required
10	50 Tons Variable Speed Positioner with Idler as per the technical specification & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	03 Sets.	5 months from the date of Purchase Order	F.O.R ,BHEL Stores, HIGH PRESSURE BOILER PLANT, BHARAT HEAVY ELECTRICALS LIMITED, Tiruchirappalli- 620014, Tamil Nadu

Important points to be taken care during submission of offer:-

1. The rate of EMD for this Tender will be (INR) : 1,50,000/-
2. The Compliance Form for Commercial Terms & Conditions to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.

All updates, amendments, corrigenda, etc., (if any), for each tender will be posted only on the above websites from time to time, as and when required, until each tender is opened. There will be no publication of such updates, amendments, corrigenda, etc., through newspapers or any other media

BHEL's General guidelines / instructions (refer MM/CE/GENL/001-EMD) including bank guarantee formats and list of consortium banks, commercial terms check-list can be downloaded from BHEL web site <http://www.bhel.com> or from the Government tender website <http://tenders.gov.in> (public sector units > Bharat Heavy Electricals Limited page) under above Enquiry reference.

Tenders should reach us before 14:00 hours on the due date
Tenders will be opened at 14:30 hours on the due date
Tenders would be opened in presence of the tenderers who have submitted their offers and who may like to be present

Yours faithfully,
For **BHARAT HEAVY ELECTRICALS LIMITED**

Engineer/ Capital Equipment / MM



Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

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Engineer/ Capital Equipment / MM

Part A

50 Tons Variable Speed Positioner with Idler

Section – I: Qualifying Criteria

The BIDDER has to compulsorily meet the following requirements to get qualified for considering the technical offer:

S.No.	PARTICULARS	VENDOR'S RESPONSE
1.0	Only those vendors (OEMs), who have supplied and commissioned at least 3 sets of Variable Speed Positioners of capacity 50 Tons or more with VFD type of rotational speed control in the last ten years (as on the date of opening of this Tender) and such Equipment is presently working satisfactorily for a minimum period of one year after commissioning (as on the date of opening of this Tender) are eligible to quote.	
2.0	Number Variable Speed Positioners of capacity (50 tons or above) supplied by the vendor till date.	
3.0	Name and postal address of the customer or company where similar equipment is installed.	
4.0	Name and designation of the contact person of the customer.	
5.0	Phone, FAX no and email address of the contact person of the customer.	
6.0	Along with this offer, the Vendor has to submit at least one Performance Certificate from their customers on customer's letter head, for satisfactory performance of Variable Speed Positioners of capacity 50 Tons or more which was supplied to them during the last ten years and is working satisfactorily for a minimum period of one year (as on date of opening of this tender). For obtaining the Performance certificate, a suggestive format is provided IN Section III of Part A.	
7.0	BHEL reserves the right to verify the information provided by vendor. In case the information provided by vendor is found to be false/ incorrect, the offer shall be rejected.	

Section – I I

The BIDDER / VENDOR is requested to provide the following information:

S. No.	PARTICULARS	VENDOR's RESPONSE
8.0	The BIDDER/VENDOR to furnish Reference List of Customers, with full address, details of contact person, where such Variable Speed Positioner of capacity 50 tons or above have been supplied during the last 5 years.	
9.0	Details of Variable Speed Positioners supplied to other BHEL units, if any. (Year of commissioning and Capacity)	
10.0	Details on SERVICE-AFTER-SALES Set-Up in India including the Address of Agents / Service Centers in South India.	
11.0	Details of Manufacturing Facilities available with the vendor for manufacturing the Variable Speed Positioner's Frame and Components: a. Fabrication Facilities b. Machining Facilities c. Heat Treatment Facilities d. Assembly & Testing Facilities	
12.0	Details on International or Indian Standards or Codes followed in the Design & Manufacture of Variable Speed Positioners	
13.0	Details of Quality Assurance System followed for Material Procurement, Fabrication and Non-Destructive Testing of Weldments & other Processes involved	

Section – III

The Performance certificate should be obtained on Customer’s Letter Head

PERFORMANCE CERTIFICATE

1. Supplier of the Equipment :
2. Make & Model of the Equipment :
3. Month & Year of Commissioning :
4. Application for which the Equipment is used:
5. a. Equipment Serial Number :
b. Variable Speed Positioner’s weight carrying & Rotating Capacity :
c. Power Rating of the Drive Mechanism :
d. Speed Control Mechanism :
6. Performance of the Equipment : Satisfactory /Not Satisfactory
7. Feed- back on ‘After Sales Service’ of the Supplier :

Date:

Signature & Seal of the Authority
Issuing the Performance Certificate

PART – B: Technical Specification of 50 Tons Variable Speed Positioner with Idler**Note:-**

1. The Column “**BIDDER’S Technical offer**” of this specification format shall be filled in by the Vendor and submitted along with the offer. Inadequate / incomplete, ambiguous or unsustainable information against any of the clauses of the specifications / requirements shall be treated as non-compliance.
2. The offer and all documents enclosed with offer should be in **English language** only.
3. Vendor’s contact details:

Name & Address of the Vendor(OEM)	Name & Address of the Indian agent:
Telephone no.:	Telephone no.:
Fax no.:	Fax no.:
e-mail:	e-mail:

Scope: - Supply, Erection & commissioning of 50 Tons Variable Speed Positioner with Idler complying with the specification as below.

S.No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER’S TECHNICAL OFFER (with Complete Details)
1.0	Application	For use in a heavy engineering industry for rotating large cylindrical jobs without jerk for welding & fabrication. Jerk during rotation will lead to welding defects.	
1.1	Job Details	Pipe diameter range:406.4 mm to 865 mm Pipe Length 4 to 25 meters Job Weight : 2 to 50 Tons Some pipes will be with heavy tees and elbows the offset of them will create eccentric loading. Eccentric Loading shall be considered as approx. 20% of 50 Tons (around 10 Tons). (Design of 50 Tons Variable Speed Positioner with Idler shall have consideration for probabilities of impact and unbalanced job positioning by which the rollers may have to take additional load than the job weight indicated above.	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER'S TECHNICAL OFFER (with Complete Details)
2.0	TECHNICAL SPECIFICATIONS OF DRIVE UNIT & IDLER UNIT		
2.1	Machine Configuration	<ol style="list-style-type: none"> 1. A set of 50 Tons Variable Speed Positioner with Idler shall consist of one drive unit and one idler unit which in combination help to rotate the job. 2. Clockwise and anticlockwise rotation along with inching facility. 3. Speed regulation through AC variable frequency drives. 4. Rollers mounted on heat treated solid shaft which are in turn housed with bearings. 5. Each drive unit shall consist of an independent AC Motor with suitable worm reduction gear boxes and speed synchronization facility. 6. All Rollers are to be of hardened steel. 	
2.2	Roller Dia of Positioner	350 to 380 mm (Vendor to specify roller dia / confirm)	
2.3	Roller Width at surface	Not to exceed 150 mm (Design considerations can be given to eccentric and impact loading while deciding the roller width.)	
2.4	Total Height of Positioner	Not to exceed 800 mm (Roller top to floor level):	
2.5	Wheel Material & Hardness	Solid Steel Forging / 300 – 350 BHN	
2.6	Roller's rolling surface speed	100 to 900 mm / min	
2.7	Centre to Centre distance of Rollers	Min: (Vendor to specify) Max: (Vendor to specify) To accommodate job diameter range.	
2.8	Roller periphery	Crowning Surface Profile on the roller periphery	
2.9	Electric Motor & Drive	AC Motor with suitable Variable Speed Drive with feedback system and synchronization for uniform job rotation.	
2.10	Drive Motor power-Kw	Vendor to specify	
2.11	Electro-Mechanical Drive Details	BIDDER to provide details on the mode of power transmission from the electric motor to the gear-box driving the Positioner.	
2.12	Gear Box Arrangement	BIDDER to furnish technical details of the Gear Box used & Arrangement proposed for mechanical power transmission. The Gear Box arrangement shall be with foot mounted electric motor.	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER'S TECHNICAL OFFER (with Complete Details)
2.13	Gear Box make	BHEL prefers to have standard gear boxes like Elecon / Shanthi / Greaves / Alloyd or any other make acceptable to BHEL rather than custom- built gear boxes. Planetary Gears are not permitted.	
2.14	Variable Speed Positioner Operation	Through Main Control and Remote Control with option to select the control mode	
2.15	Hand held Control Unit	A hand held control unit with 10 Meter long cable to be provided for Speed Variation, ON & OFF, Emergency Off, Forward & Reverse Rotation functions	
3.0	IDLER UNIT:	The Idler unit is identical in all aspects except that the idler unit will not have any variable drive for rotation. Earthing: 1200 amps. (DC) Earth Return Arrangement contacting Idler Unit's Steel Wheels shall be provided, as welding is the main operation for which the ariable Speed Positioner is intended. Return earth details with data sheet to be submitted with offer.	

4.0	General Features for DESIGN & FABRICATION		
4.1	Wheel Adjustment	<ol style="list-style-type: none"> Each wheel assembly with Housing/Bracket and Integral Drive Unit shall be movable on the Positioner's Base Frame, so as to locate & lock each wheel assembly at required pitches to cover the job diameter range. The wheel adjustment mechanism shall be provided with lead screw with LH and RH threads and capable of adjusting <u>manually</u> for infinite positioning. The mechanism has to be designed to take care of full load. 	
4.2	Hardness and finish of Base frame slide	The sliding surface of the base frame, Drive and idler unit's bottom surfaces shall be smoothly finish machined. The base frame shall have sufficient thickness in order to withstand the bending force due to unevenness on the floor surface.	
4.3	Wheel Alignment	The alignment of the wheel face in the plane perpendicular to the wheel shaft axis to be maintained within 1 mm for the entire stroke of the wheel assembly positions on the base frame.	
4.4	Wheel Positioning	<ol style="list-style-type: none"> There shall be suitable provision for locking the wheel assembly with the base frame, to prevent movement under working / loaded condition. Additionally lock pin arrangement at intervals of around 100 mm, is to be provided. 	
4.5	Wheel Shaft Assembly	The high grade shafts are to be shrunk fit into wheel assemblies / with shrink disc, to eliminate the provision of key arrangement	

4.6	Wheel Support	The wheel assembly with integral shaft shall be supported by heavy duty roller bearings on either side with fabricated bearing housing.	
S.No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER'S TECHNICAL OFFER (with Complete Details)
4.7	Lifting Hook	Four numbers of Lifting Hook are to be provided at suitable locations for lifting the entire Positioner unit by EOT Crane in a geometrically balanced state.	
4.8	Cover for Gears	Suitably profiled outer-covers (easily replaceable) are to be provided for the spur gears, to protect from welding flux, slag and foreign particles, while in operation. The thickness of the steel cover plate shall be minimum 3 mm.	
4.9	Cover for drive / idlers	Suitable Metallic cover has to be provided for both the drive and idler units.	
4.10	Cover for base frame	Suitably profiled steel sheet covers (easily replaceable) are to be provided to cover the sliding surface (top face) of the base frame, to protect from welding flux, slag and other foreign particles falling on it, while in operation. The thickness of the cover plate shall be minimum 3mm.	
4.11	Electric Power Input	Electric Input Power through a 3 Phase AC, $415 \pm 10\%$ V, $50 \pm 2\%$ Hz, 3 Wire System with 4 th Wire for Protective Earthing (No neutral).	
4.12	Ambient Condition	Indoor Working Environment with temperature up to 50°C and Humidity up to 85%, but both do not occur simultaneously. The offered equipment shall be tropicalized to withstand the above conditions.	
4.13	Control Voltage	preferably 24 V ---- Bidder to Specify	
4.14	Bought-Out Items:		
	a. BIDDER has to list down all the Bought-Out Items with makes and technical specifications.		
	b. BHEL prefers to have only reputed makes of Bought-Out Items / Components from companies, like ABB / SIEMENS / GE / BALDOR for Electric Motors and TIMKEN / SKF for Bearings. All electrics shall be of reputed make like Siemens / L&T / BCH / Telemecanique.		
	c. The variable speed drive shall be of ABB / SIEMENS / ALLEN BRADLEY make.		
	d. The electric motor used shall have a speed of 1450 rpm.		
	e. The Gear box shall be of Greaves / Elecon / Bonfiglioli or any other reputed make acceptable to BHEL.		
5.0	Structural Fabrication		

5.1	Base Frame and Wheel Bracket / Housing	Heavy Steel Fabrication Procedures to be followed	
S.No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER'S TECHNICAL OFFER (with Complete Details)
5.2	Raw Material	Tested and certified steel plates only should be used. Test Certificates to be produced for BHEL verification during Pre dispatch inspection.	
5.3	Welded Joints	Butt Joints are not allowed for length Build-Up in plates.	
5.4	Welded Joint Testing	All Fillet Welded Joints in the positioner shall be subjected to Liquid Penetrant Inspection (LPI) and Magnetic Particle Inspection (MPI). Test Documents to be produced for BHEL verification. Random MPI / LPI to be shown to BHEL at the time of inspection at vendor's works.	
5.5	Heat Treatment	The Structural Items (Base Frame / Wheel Housing, etc.) shall be Stress Relieved after welding and NDT examinations.	
5.6	Machining Operation	All mechanical mating / sliding surfaces are to be machined and ground to the required finish after heat treatment wherever necessary.	
5.7	Surface Cleaning	All steel parts are to be shot blasted or chemically treated for surface cleaning.	
5.8	Painting	The Positioner to be painted as specified below: a. One coat of Red Oxide Primer (Zinc Chromate) with 25 μ of DFT (Dry Film Thickness) and 48 hours of compulsory curing after painting. b. Two coats of Enamel Paint [Ethyl Zinc Silicate of Colour – International Tractor Orange] each with a DFT of 25 μ and intermittent curing of 16 hours.	
5.9	Frame Dimensions	BIDDER has to indicate the tentative DIMENSIONS for the Base Frame of Drive and Idler Units.	
6.0	Spares Supply:		
6.1	BIDDER to Quote for the following spares along with the Positioner : a) Bearings for each wheel assembly – 2 Sets. b) Seals, gaskets & Belts used in the Positioner – 1 Set. c) Pulleys & Couplings used in the Positioner– 1 Set. d) AC Variable Frequency Drive – 1 No.		
7.0	Inspection	The following Schedule of Inspection will be carried out, prior to dispatch of Positioner from Supplier's Works: a) Verification of Test Certificates.	

		b) Idle Run Test and Load Test (on mutually agreed norms). c) Verification of O&M Manuals as per Specification Clause No.8.3.	
S.No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER'S TECHNICAL OFFER (with Complete Details)
8.0	DRAWINGS / DOCUMENTS / DETAILS:		
8.1	Drawings and Documents along with offer:	<p>The following documents and details are to be submitted along with offer for technical evaluation of the tender</p> <ol style="list-style-type: none"> GA Drawing of the Positioner. GA Drawing of Wheel Drive Mechanism GA Drawing of Electric/Electronic System. Sub-Assembly Drawing for Wheels. Calculations for Selection of Electric Motors, Gear Reducers, etc. Weight of the Positioner assembly. Return earth arrangement with data sheet <p>Note: All the drawings should have the major & critical dimensions and list of bought out items with make and specification.</p>	
8.2	Drawings and Documents for Approval prior to manufacture:	<p>The following documents and details are to be submitted for BHEL Approval, prior to taking up the manufacture of the Positioner.</p> <ol style="list-style-type: none"> GA Drawing of the Positioner. GA Drawing of Wheel Drive Mechanism. GA Drawing of Electric/Electronic System. Sub-Assembly Drawing for Wheels. Calculations for Selection of Electric Motors, Gear Reducers, etc. Wiring Diagram with Logic Circuits. Weight of the Positioner (Drive Unit & Idler Unit separately) including all Electrical Equipment. <p>Note: All the drawings to have the major & critical dimensions with part descriptions, make and specification.</p>	
8.3	Drawings and Documents to be supplied along with Equipment supply: O & M Manuals	<p>Each Positioner set shall be provided with Three Copies of Operation & Maintenance Manual containing the following technical details :</p> <ol style="list-style-type: none"> General Arrangement drawing of Positioner Electrical Wiring Diagram Gear Box Details / Drawings Drawings of wear components like box nut, screw rod for wheel frame 	

		<p>movement, open gears and pinion if any</p> <ul style="list-style-type: none"> e) Specifications of Bought-Out Items f) Warranty Card for all Bought-Out Items g) Trouble Shooting Chart for all Sub-Systems h) Variable speed Drive manual. i) Mechanical manufacturing drawings for all wearing parts. j) O&M manual with complete specification of the equipment and Preventive Maintenance check list. <p>Note: 1. One soft copy of the entire documents stated above to be provided in Pen drive. 2. One Hard copy and one soft copy to be submitted at the time of inspection at suppliers works.</p>	
9.0	ERECTION & COMMISSIONING		
9.1	Erection / Assembly	Erection / Assembly of the Positioner will have to be done by the Qualified Technical Representative of the Supplier at BHEL Works	
9.2	Commissioning	Commissioning, Performance Prove –Out for Carrying & Rotating Capacities and Smooth Functioning of the Variable Speed Positioner at BHEL Works shall be the responsibility of the supplier.	
10.0	Guarantee	The Variable Speed Positioner complete shall be guaranteed for a minimum period of 12 months from the date of commissioning at BHEL or 18 months from the date of dispatch.	