



An ISO 9001
Company

Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

ENQUIRY NOTICE INVITING TENDER	Phone: +91 431 257 76 53 Fax : +91 431 252 00 31 Email : skaruna@bheltry.co.in Web : www.bhel.com
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TWO PART BID	Enquiry Number:	Enquiry Date:	Due date for submission of quotation:
Tender to be submitted in two Parts	2631600003	28.01.2016	29.02.2016

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.

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.

Item	Description	Quantity
10	10 Ton Idler Positioner	12 Nos.
20	30 Ton Variable Speed Positioner with Idlers	02 Sets.

as per the technical specification & commercial conditions applicable (to be downloaded from web site www.bhel.com or <http://tenders.gov.in>)

Important points to be taken care during submission of offer

1. The rate of EMD for this Tender will be (INR) : 1,00,000/-
2. The Compliance form for Acceptance of Commercial Terms & Conditions to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.
3. 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 Compliance form 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**


Sr. Engineer / MM / Capital Equipment

Part A

10 Tons Idler Positioner

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 Minimum TEN years of experience in Design, Manufacturing ,supply and commissioning of variable speed positioners of capacity 30 Tons or more with VFD type of rotational speed control are eligible to quote.	
2.0	Only those vendors (OEMs), who have supplied and commissioned at least TWO sets of variable speed positioners of capacity 30 Tons or more with VFD type of rotational speed control in the past ten years (as on original date of opening Tender) should quote. Vendor to provide the details of these customers to whom they have supplied these equipment.	
3.0	Vendor has to submit at least one Performance Certificate from their customers, for satisfactory performance of variable speed positioners of capacity 30 Tons or more with VFD type of rotational speed control quoted against this enquiry, for a minimum period of one year (as on original date of opening tender) and is presently working satisfactorily For obtaining the Performance certificate, a suggestive format is provided.	
4.0	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 – II

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

S.NO	PARTICULARS	VENDOR's RESPONSE
5.0	The BIDDER/VENDOR to furnish Reference List of Customers, with full address, details of contact person, where such Variable Speed Positioner of capacity 30 tons or above have been supplied.	
6.0	Details of Variable Speed Positioners supplied to other BHEL units, if any. (Year of commissioning and Capacity)	
7.0	Details on SERVICE-AFTER-SALES Set-Up in India including the Address of Agents / Service Centres in South India.	
8.0	Details of Manufacturing Facilities available with the vendor for manufacturing the Idler Positioner's Frame and Components: a. Fabrication Facilities b. Machining Facilities c. Heat Treatment Facilities d. Assembly & Testing Facilities	

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. Service After Sales support from the Supplier : Satisfactory /Not Satisfactory

Date:

Signature & Seal of the Authority

Issuing the Performance Certificate

Name:

Designation:

Office/mobile no:

Mail id:

PART – B
Technical Specification of 10 Tons Idler positioner.
QTY: 12 NOS

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:	Name & Address of the Indian agent:
Telephone no.:	Telephone no.:
Fax no.:	Fax no.:
e-mail:	e-mail:

Scope: - Supply, Erection & commissioning of EACH 10 Tons load carrying Idler positioner complying with the specification as below.

S.No.	PARTICULARS	BHEL SPECIFICATIONS	Vendor’s Response
1.0	Application	<p>To use in a heavy engineering industry for rotating large cylindrical Jobs/Pipes for welding & fabrication.</p> <p>The idler positioners are intended to use along with the existing set of ONE 30 Tons Variable Speed Positioner with ONE Idler positioner. The modified station will consist of ONE 30T Variable Speed Positioner with THREE 10 Ton idler positioner (2 new idler positioner quoted for this tender for each station) which in combination help to rotate the job. (Total 12 idlers required to modify 6 stations).</p>	
1.1	Job Details	<p>Pipe diameter range:406.4 mm to 865 mm Pipe Length : 4 to 25 meters Job Weight : 2 to 30 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 total load 30 Tons (around 6 to 8 Tons). (Design of 10 Tons Idlers 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).</p>	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	Vendor's Response
2.0	TECHNICAL SPECIFICATIONS OF IDLER UNIT		
2.1	Idler positioner Configuration	<ol style="list-style-type: none"> 1. This idlers should rotate Clockwise and anticlockwise directions. 2. All Rollers are to be of hardened steel. 3. Rollers mounted on heat treated solid shaft which are in turn housed with bearings. 4. Manually Variable Height adjustment with hand lever up to 100 mm with suitable lead screw, lock nut and minimum 2 nos ball bushing guide rod with dust protection and grease nipple arrangement to withstand load carrying and rotation of each 10 Ton load. <p>Vendor to provide the design details of the lead screw and load capacity calculations. Vendor to confirm</p>	
2.2	Roller Dia of Positioner	350 mm for 6 Idler positioners and 300mm for remaining 6 idler positioners In order to match the existing station Vendor to 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. Vendor to specify	
2.4	Total Height of Positioner	Not to exceed 800 mm including 100mm height up and down adjustment (Roller top to floor level). Vendor to confirm	
2.5	Wheel Material & Hardness	Solid Steel Forging / 300 – 350 BHN. Vendor to confirm	
2.6	Roller's rolling surface speed	100 to 900 mm / min. Vendor to confirm	
2.7	Centre to Centre distance of Rollers	Min: 450 mm (Vendor to confirm) Max: 650 mm (Vendor to confirm) Must accommodate job diameter range.	
2.8	Roller periphery	Crowning Surface Profile on the roller periphery. Vendor to confirm	
2.9	Lubrication	Appropriate lubrication points to be provided for all bearings & box nuts. Vendor to confirm	
3.0	Earthing for Idler positioners:	1200 amps. (DC) Earth Return Arrangement contacting Idler Unit's Steel Wheels shall be provided, as welding is the main operation for which the variable Speed Positioner is used. Vendor to provide details along with offer.	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	Vendor's Response
4.0	General Features for DESIGN & FABRICATION		
4.1	Wheel Adjustment	<ol style="list-style-type: none"> 1. Each wheel assembly with Housing/Bracket shall be movable on the Positioner's Base Frame 2. There shall be suitable provision for locking the wheel assembly with the base frame, to prevent movement under working / loaded condition. 3. Additionally lock pin arrangement at intervals of around 50 mm, is to be provided on the base frame. 4. The wheel adjustment mechanism shall be provided with lead screw with LH and RH threads and capable of adjusting manually for infinite positioning .The mechanism has to be designed to take care of full load. (Note: In existing positioners M75x 10 thread for both LH and RH is used). Vendor to confirm 	
4.2	Hardness and finish of Base frame slide	The sliding surfaces of the base frame, idler units shall be hardened and ground. The base frame shall have sufficient thickness in order to withstand the bending force due to unevenness on the floor surface. Vendor to confirm	
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. Vendor to confirm	
4.4	Wheel Shaft Assembly	The high grade shafts are to be shrunk fit into wheel assemblies to eliminate the provision of key arrangement. Vendor to confirm.	
4.5	Wheel Support	The wheel assembly with integral shaft shall be supported by heavy duty roller bearings on either side with fabricated bearing housing. Vendor to confirm	
4.6	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. (For easy shifting from one place to another). Vendor to confirm	
4.7	Cover for base frame	Suitably profiled steel sheet covers (with easily replaceable provisions) 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. Vendor to confirm	
4.8	Electric Power Input	Electric Input Power used in existing drive positioner 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). Vendor to confirm	
4.9	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. Vendor to confirm	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	Vendor's Response
4.10	Levelling screw	The idler units are placed on floor without foundation. To levelling and locking the units, levelling screw at suitable location is to be provided. Vendor to confirm	
4.11	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 TIMKEN / SKF for Bearings or any other make acceptable to BHEL. Vendor to confirm	
5.0	Structural Fabrication		
5.1	Base Frame and Wheel Bracket / Housing	Heavy Steel Fabrication Procedures to be followed. Vendor to Specify Details of all Structural materials (Like Thickness, Material Grade & Weight). Vendor to confirm	
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. Vendor to confirm	
5.3	Welded Joints	Butt Joints are not allowed for length Build-Up in plates. Vendor to confirm	
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. Vendor to confirm	
5.5	Heat Treatment	The Structural Items (Base Frame / Wheel Housing, etc.) shall be Stress Relieved after welding and NDT examinations. Vendor to confirm	
5.6	Machining Operation	All mechanical mating/ sliding surfaces are to be machined and ground to the required finish after heat treatment wherever necessary. Vendor to confirm	
5.7	Punch Mark for alignment	Punch marks are required to ensure aligning the positioners in a straight line and parallel to each other thereby eliminating the skewing of job. Punch Marks to be provided at suitable location to avoid hindrance between them for measuring the diagonal length and straight length between the punch marks. Vendor to confirm	
5.8	Surface Cleaning	All steel parts are to be surface clean before painting. Vendor to confirm	
5.9	Painting	The Positioner to be painted as specified below: a. One coat of Red Oxide Primer painting. b. Two coats of Enamel Paint [Ethyl Zinc Silicate of Colour – International Tractor Orange]. Vendor to confirm	
5.10	Frame Dimensions	BIDDER has to indicate the tentative DIMENSIONS for the Base Frame and Idler Units. Vendor to confirm	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	Vendor's Response
6.0	Spares Supply:		
6.1	BIDDER to Quote for the following spares along with the Positioner : a) Bearings for wheel assembly – 2 Sets. b) Box nut – (for LH/RH & Height Adjustment) – 2 Set in Each type. c) Wheels – 1 Set. Vendor to confirm		
7.0	Manufacturing drawings approval		
7.1	After placement of Purchase order, vendor has to submit all manufacturing drawings to BHEL within 30 days for approval before manufacture. BHEL will approve the same in 15 days. Vendor to confirm		
8.0	Pre Dispatch Inspection at vendor's works		
8.1	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 c) Verification of O&M Manuals as per Specification Clause No.8.3. Vendor to confirm		
9.0	DRAWINGS / DOCUMENTS / DETAILS:		
9.1	Drawings and Documents along with offer:	The following documents and details are to be submitted along with offer for technical evaluation of the tender a. GA Drawing of the Idler Positioner. b. Sub-Assembly Drawing for Wheel assembly. c. Weight of the Idler Positioner assembly. Note: All the drawings should have the major & critical dimensions and list of bought out items with make and specification. Vendor to confirm	
9.2	Drawings and Documents for Approval prior to manufacture:	The following documents and details are to be submitted for BHEL Approval, prior to taking up the manufacture of the Idler Positioner. a. GA Drawing of the idler Positioner. b. Sub-Assembly Drawing for Wheel assembly. c. Weight of the idler Positioner. Note: All the drawings to have the major & critical dimensions with part descriptions, make and specification. Vendor to confirm	
9.3	Drawings and Documents to be supplied along with Equipment supply: O & M Manuals	Each Positioner set shall be provided with two Copy of Operation & Maintenance Manual containing the following technical details : a. General Arrangement drawing of Positioner b. Specifications/data sheet of Bought-Out Items c. Mechanical manufacturing drawings for all wearing parts. Note: 1. One soft copy of the entire documents stated above to be provided in CD/DVD. 2. One Hard copy and one soft copy to be submitted at the time of inspection at suppliers works. Vendor to confirm.	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	Vendor's Response
10.0	ERECTION & COMMISSIONING		
10.1	Erection / Assembly	Erection / Assembly of the Positioner will have to be done by the Technical Representative of the Supplier at BHEL Works. Vendor to confirm	
10.2	Commissioning	Commissioning, Performance Prove –Out for Carrying & Rotating Capacities and Smooth Functioning of the idler Positioner at BHEL Works shall be the responsibility of the supplier. Vendor to confirm	
11.0	Guarantee	The equipment 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. Vendor to confirm	

Part A

30 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 Minimum TEN years of experience in Design, Manufacturing ,supply and commissioning of variable speed positioners of capacity 30 Tons or more with VFD type of rotational speed control (as on the opening of this tender) are eligible to quote.	
2.0	Only those vendors (OEMs), who have supplied and commissioned at least TWO sets of variable speed positioners of capacity 30 Tons or more with VFD type of rotational speed control in the past ten years (as on original date of opening tender) should quote. Vendor to provide the details of these customers to whom they have supplied these equipment.	
3.0	Vendor has to submit at least one Performance Certificate from their customers, for satisfactory performance of variable speed positioners of capacity 30 Tons or more with VFD type of rotational speed control quoted against this enquiry, for a minimum period of one year (as on original date of opening tender) and is presently working satisfactorily For obtaining the Performance certificate, a suggestive format is provided.	
4.0	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 – II

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

S.NO	PARTICULARS	VENDOR's RESPONSE
5.0	The BIDDER/VENDOR to furnish Reference List of Customers, with full address, details of contact person, where such Variable Speed Positioner of capacity 30 tons or above have been supplied.	
6.0	Details of Variable Speed Positioners supplied to other BHEL units, if any. (Year of commissioning and Capacity)	
7.0	Details on SERVICE-AFTER-SALES Set-Up in India including the Address of Agents / Service Centres in South India.	
8.0	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	

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. Service After Sales support from the Supplier : Satisfactory /Not Satisfactory

Date:

Signature & Seal of the Authority

Issuing the Performance Certificate

Name:

Designation:

Office/mobile no:

Mail id:

PART – B
Technical Specification of 30 Tons Variable Speed Positioner with Idlers

QTY: 2 Sets (Each set: 1 Drive+ 3 Idlers)

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:	Name & Address of the Indian agent:
Telephone no.:	Telephone no.:
Fax no.:	Fax no.:
e-mail:	e-mail:

Scope: - Supply, Erection & commissioning of 30 Tons Variable Speed Positioner with Idlers complying with the specification as below.

S.No	PARTICULARS	BHEL SPECIFICATIONS	Vendor’s Response
1.0	Application	To use in a heavy engineering industry for rotating large cylindrical Jobs/Pipes for welding & fabrication. Vendor to confirm	
1.1	Job Details	Pipe diameter range:406.4 mm to 865 mm Pipe Length : 4 to 25 meters Job Weight : 2 to 30 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 30 Tons (around 6Tons to 8 Tons). (Design of 30 Tons Variable Speed Positioner with Idlers 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. Vendor to confirm	
2.0	TECHNICAL SPECIFICATIONS OF DRIVE UNIT & IDLER UNIT		
2.1	Machine Configuration and features	<ol style="list-style-type: none"> 1. A Set of 30 Tons Variable Speed Positioner with Idlers shall consist of ONE drive unit and THREE idler units 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 (VFD). 	

S.No	PARTICULARS	BHEL SPECIFICATIONS	Vendor's Response
2.1 cont		<p>4. Each drive unit roller wheel shall consist of an independent AC Motor with suitable worm reduction gear boxes and speed synchronization facility. The drive unit should have 30 Ton rotating capacity and 10 Ton load carrying capacity. Each Idler unit should have 10 Ton load carrying capacity.</p> <p>5. The Idler positioners must have manually Variable Height adjustment mechanism with hand lever up to 100 mm with suitable lead screw, lock nut and minimum 2 Nos ball bushing guide rod with dust protection and grease nipple arrangement to withstand load carrying and rotation of job. Vendor to provide the design details of the lead screw and load capacity calculations.</p> <p>6. Height adjustment mechanism is NOT required in Drive positioner.</p> <p>7. All Rollers are to be of hardened steel.</p> <p>8. Rollers mounted on heat treated solid shaft which are in turn housed with bearings. Vendor to confirm</p>	
2.2	Roller Dia of Positioner	350 mm (Vendor to specify exact roller dia)	
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.) Vendor to specify	
2.4	Total Height of Positioner	Not to exceed 800 mm including 100mm height up and down adjustment (Roller top to floor level). Vendor to specify	
2.5	Wheel Material & Hardness	Solid Steel Forging / 300 – 350 BHN. Vendor to confirm	
2.6	Roller's rolling surface speed	100 to 900 mm / min. Vendor to confirm	
2.7	Centre to Centre distance of Rollers	Min: Around 450mm (Vendor to specify) Max: Around 650mm (Vendor to specify) Must accommodate entire job diameter range specified.	
2.8	Roller periphery	Crowning Surface Profile on the roller periphery. Vendor to confirm	
2.9	Electric Motor & Drive	AC Motor with suitable Variable Speed Drive with synchronization for uniform job 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 variable Speed Positioner is intended. Vendor to confirm	
2.10	Drive Motor power-Kw	Vendor to specify	

S.No	PARTICULARS	BHEL SPECIFICATIONS	Vendor's Response
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. Vendor to specify	
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. Vendor to specify	
2.13	Variable Speed Positioner Operation	Through Main Control panel and Hand held Remote Control panel with option to select the control mode. Vendor to confirm	
2.14	Hand held Remote 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. Vendor to confirm	
2.15	Lubrication	Appropriate lubrication points to be provided for all bearings & box nuts. Vendor to confirm	
2.16	Electrical Control Panel	AC VFD panel consisting of Input MCB, START/STOP/RESET push buttons, ON/OFF TRIP Indicator lamps (LED type), Speed varying POT - 10 Turns with Dial indication. IP-54 enclosure with cooling fan. Panel board should have lock and key arrangements. Suitable rated terminal blocks must be provided for power and Control wiring with clear markings. Provision Shall be given for cable entry. PAINT: Siemen grey. Vendor to confirm	
2.17	Levelling screw	The drive and idler units are placed on floor without foundation. To levelling and locking the units, levelling screw at suitable location is to be provided. Vendor to confirm	
3.0	IDLER UNIT:	The Idler unit with 100 mm height adjustment mechanism is identical in all aspects except that the idler unit will not have any 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 variable Speed Positioner is intended. Vendor to provide details along 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. 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 50 mm, is to be provided. The wheel adjustment mechanism shall be provided with lead screw with LH and RH threads and capable of adjusting manually for infinite positioning. The mechanism has to be designed to take care of full load. Vendor to confirm 	

S.No	PARTICULARS	BHEL SPECIFICATIONS	Vendor's Response
4.2	Hardness and finish of Base frame slide	The sliding surfaces of the base frame, Drive and idler units shall be hardened and ground. The base frame shall have sufficient thickness in order to withstand the bending force due to unevenness on the floor surface. Vendor to confirm	
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. Vendor to confirm	
4.4	Wheel Shaft Assembly	The high grade shafts are to be shrunk fit into wheel assemblies to eliminate the provision of key arrangement. Vendor to confirm	
4.5	Wheel Support	The wheel assembly with shaft shall be supported by heavy duty roller bearings on either side with fabricated bearing housing. Vendor to confirm	
4.6	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. (For easy shifting from one place to another). Vendor to confirm	
4.7	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. Vendor to confirm	
4.8	Cover for base frame	Suitably profiled steel sheet covers (with easily replaceable provisions) 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. Vendor to confirm	
4.9	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). Vendor to confirm	
4.10	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. Vendor to confirm	
4.11	Control Voltage	Control Voltage 24 V. Bidder to Confirm.	

S.No	PARTICULARS	BHEL SPECIFICATIONS	Vendor's Response
4.12	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 1440 rpm.		
	e. BHEL prefers to have standard gear boxes like Elecon / Shanthi / Greaves / Allroyd/ Bonfiglioli or any other make acceptable to BHEL rather than custom-built gear boxes. Vendor to confirm		
5.0	Structural Fabrication		
5.1	Base Frame and Wheel Bracket / Housing	Heavy Steel Fabrication Procedures to be followed. Vendor to Specify Details of all Structural materials (Like Thickness, Material Grade & Weight). Vendor to confirm	
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. Vendor to confirm	
5.3	Welded Joints	Butt Joints are not allowed for length Build-Up in plates. Vendor to confirm	
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. Vendor to confirm	
5.5	Heat Treatment	The Structural Items (Base Frame / Wheel Housing, etc.) shall be Stress Relieved after welding and NDT examinations. Vendor to confirm	
5.6	Machining Operation	All mechanical mating/ sliding surfaces are to be machined and ground to the required finish after heat treatment wherever necessary. Vendor to confirm	
5.7	Punch Mark for alignment	Punch marks are required to ensure aligning the positioners in a straight line and parallel to each other thereby eliminating the skewing of job. Punch Marks to be provided at suitable location on positioners to avoid hindrance between them for measuring the diagonal length and straight length between the punch marks. Vendor to confirm	
5.8	Surface Cleaning	All steel parts are to be surface clean before painting. Vendor to confirm	
5.9	Painting	The Positioner to be painted as specified below: a. One coat of Red Oxide Primer (Zinc Chromate). b. Two coats of Enamel Paint [Ethyl Zinc Silicate of Colour – International Tractor Orange] each. Vendor to confirm	

S.No	PARTICULARS	BHEL SPECIFICATIONS	Vendor's Response
5.10	Frame Dimensions	BIDDER has to indicate the tentative DIMENSIONS for the Base Frame of Drive and Idler Units. Vendor to confirm	
6.0	Spares Supply:		
6.1	BIDDER to Quote for the following spares along with the Positioner :		
	<ul style="list-style-type: none"> a) Bearings for wheel assembly – 2 Sets. b) Belts used in the Positioner – 1 Set. c) Pulleys and Couplings used in the Positioner– 1 Set. d) AC Variable Frequency Drive – 1 No. e) Box nut – (for LH/RH & Height Adjustment) – 2 Set in Each type. f) Pinion and Gear – 1 Set. Vendor to confirm 		
7.0	Inspection	<p>The following Schedule of Inspection will be carried out, prior to dispatch of Positioner from Supplier's Works:</p> <ul style="list-style-type: none"> a) Verification of Test Certificates. b) Idle Run Test and Load Test. c) Verification of O&M Manuals as per Specification Clause No.8.3. Vendor to confirm 	
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> <ul style="list-style-type: none"> a. GA Drawing of the drive and idler Positioner. b. GA Drawing of Wheel Drive Mechanism c. GA Drawing of Electric/Electronic System. d. Sub-Assembly Drawing for Wheel assembly. e. Weight of the Positioner assembly. <p>Note: All the drawings should have the major & critical dimensions and list of bought out items with make and specification. Vendor to confirm</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> <ul style="list-style-type: none"> a. GA Drawing of the Positioner. b. GA Drawing of Wheel Drive Mechanism. c. GA Drawing of Electric/Electronic System. d. Sub-Assembly Drawing for Wheel assembly. e. Calculations for Selection of Electric Motors, Gear Reducers, etc. f. Wiring Diagram with Logic Circuits. g. Weight of the Positioner (Drive Unit & Idler Unit separately) including all Electrical Equipment. <p>Note: 1.All the drawings to have the major & critical dimensions with part descriptions, make and specification. 2 After placement of Purchase order, vendor has to submit all manufacturing drawings to BHEL within 30 days for approval before manufacture.BHEL will approve the same within 15 days. Vendor to confirm.</p>	

8.3	Drawings and Documents to be supplied along with Equipment supply: O & M Manuals	Each Positioner set shall be provided with Three Copies of Operation & Maintenance Manual containing the following technical details : a. General Arrangement drawing of Positioner b. Electrical Wiring Diagram c. Gear Box Details / Drawings d. Specifications/data sheets of Bought-Out Items e. Variable speed Drive manual. f. Mechanical manufacturing drawings for all wearing parts. g. Screw rods and box nuts details. Vendor to confirm	
S.No	PARTICULARS	BHEL SPECIFICATIONS	Vendor's Response
		Note: 1. One soft copy of the entire documents stated above to be provided in CD/DVD. 2. One Hard copy and one soft copy to be submitted at the time of inspection at supplier's works. Vendor to confirm	
9.0	ERECTION & COMMISSIONING		
9.1	Erection / Assembly	Erection / Assembly of the Positioner will have to be done by the Technical Representative of the Supplier at BHEL Works. Vendor to confirm	
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. Vendor to confirm	
10.0	Guarantee	The entire equipment 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. Vendor to confirm	