



Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

An ISO 9001
Company

ENQUIRY

NOTICE INVITING TENDER

Phone: +91 431 257 79 38

Fax : +91 431 252 00 31

Email : tvenkat@bheltry.co.in

Web : www.bhel.com

TWO PART BID

Tender to be submitted in two Parts

Enquiry
Number:

2851300032

Enquiry
Date:

27.11.2013

Due date for submission of
quotation:

06.01.2014

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	Delivery Schedule
10	CNC Four Roll Plate Rolling Machine as per the technical specification & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	1.00 No	8 months from date of PO

Important points to be taken care during submission of offer

1. Checklist No. BND/IMP/02 & BND/IND/02A and to be filled and enclosed along with the offer failing which, the Offer will not be considered for evaluation.
2. Material shall be delivered to FOR, BHEL Stores, POWER EQUIPMENT FABRICATION PLANT, BHARAT HEAVY ELECTRICALS LIMITED, Mundipar- 441804, Taluka: Sakoli, District: Bhandara, Maharashtra State.
3. Time period required for Erection & Commissioning shall be 1 Month from the date of intimation by BHEL requesting supplier to depute Service Engineers about site readiness.
4. EMD for this Tender will be (₹) : 2,00,000.00
5. Vendor should submit all Technical documents in duplicate.
6. 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 Enquiry reference "2851300032".

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. Manager / Capital Equipment / MM

T. VENKATESWARAN
Senior Manager
Capital Equipment / MM
BHEL, Tiruchirappalli - 620 014.

4 ROLL PLATE ROLLINGMACHINE (Capacity –30 mm)

PART - A

SECTION- 1: Qualifying Criteria

The BIDDER has to compulsorily meet the Qualifying Criteria indicated in **Section 1** to get qualified. Otherwise the technical offer will not be considered.

S No.	REQUIREMENTS	VENDOR'S RESPONSE
1.1	The BIDDER / VENDOR (OEM) shall have a minimum of TEN Years of Continuous Experience in the Design, Manufacture & Supply of ' 4 ROLL PLATE ROLLING MACHINE '. Vendor shall indicate the actual no. of years of experience in the field	
1.2	<p>Only those vendors (OEMs) should quote, who have commissioned in the past (10) years (on the original date of opening of Tender) at least ONE '4 ROLL PLATE ROLLING MACHINE' having all the following features:</p> <ol style="list-style-type: none"> 1. Rolling of 30mm thick plate to min. ID 2050mm of length 3000mm. 360N/mm² plate yield strength, 500N/mm² UTS. 2. Pre-bending of 18mm thick plate and rolling to min. ID 620mm of length 3000mm. 360N/mm² plate yield strength, 500N/mm² UTS. 3. Max. out of parallelism of rollers 0.05mm. 4. Control of roller positions and movement through CNC Digital with hydraulic system. 5. Guidance of side rolls through planetary links. 6. CNC control of full machine. 7. Conical rolling through CNC control and hydraulics. 8. All movement and rolling of rolls shall be hydraulic. <p>either (i) in at least one country other than the country of origin to establish vendor's (OEM's) global business activity or (ii) in India ; and the referred machine is presently working satisfactorily for more than one year after commissioning (on the original date of opening of Tender). The name and contact addresses of the customers to whom the machine has been supplied has to be furnished with details.</p> <p>BHEL reserves the right to accept or reject the OEMs based on the assessment of their technical and financial capability.</p>	

S No.	REQUIREMENTS	VENDOR'S RESPONSE
1.3	<p>Vendor has to submit at least ONE PERFORMANCE CERTIFICATE from their customers in India or from the customers to whom the machine was supplied outside the country of origin, for satisfactory performance of the machine as given under Clause 1.2 above, for a minimum period of one year (on the original date of opening of Tender). (Original Certificate or through E-mail directly from the customer). The original performance certificate may be returned after verification by BHEL, if required.</p> <p>For obtaining the Performance certificate, a suggestive format is provided.</p>	
1.4	<p>BHEL reserves the right to verify the information provided by the Vendor for the referred machine at their referred customer's works. It shall be the responsibility of the vendor to facilitate the visit of BHEL's team at their referred customer works .The Travel and Boarding expenses for BHEL Personnel shall be borne by BHEL. In case the information provided by vendor is found to be false/ incorrect, the offer shall be rejected.</p>	

SECTION - 2:

The BIDDER / VENDOR are requested to provide the following information:-

S No.	REQUIREMENTS	VENDOR'S RESPONSE
2.1	<p>The BIDDER / VENDOR to furnish reference list of Customers, with complete address, details of contact person, where CNC 4 ROLL PLATE ROLLING MACHINES have been supplied in the past.</p>	
2.2	<p>Specify details of CNC4 ROLL PLATE ROLLING MACHINES supplied to other units of BHEL, if any (Year of commissioning with all parameters etc.)</p>	
2.3	<p>Details on SERVICE-AFTER-SALES Set-up in India including the Address of Agents / Service Centres in India.</p>	
2.4	<p>Any additional data to supplement the manufacturing capability of the BIDDER for the subject equipment.</p>	

SECTION – 3:

The BIDDER to note:

S No.	REQUIREMENTS	VENDOR'S RESPONSE
3.1	The BIDDER / VENDOR shall submit the offer in TWO parts. 1. Technical Offer [with PART A & PART B] 2. Commercial Offer and Price bid.	
3.2	The Technical Offer shall contain complete details against all clauses of Technical Specifications given by BHEL.	
3.3	The Technical Offer shall be supported by copies of product Catalogues, DataSheets and technical details of Bought- Out- Items.	
3.4	The Commercial Offer (given with the Technical Offer) shall contain the Scope of Supply and the Un-Priced Part of the Price-Bid, for confirmation.	

Suggestive Format of Performance Certificate:

The Performance certificate should be produced on **Customer's Letter Head** and submitted along with the offer.

PERFORMANCE CERTIFICATE

1.0	Machine Supplied by(Manufacturer's name)	
2.0	Make & Model number of the Machine	
3.0	Month & Year of Commissioning	
4.0	Application for which m/c is used	
5.0	Machine Details	
5.1	CNC 4 Roll rolling machine	
5.2	Top roll diameter	
5.3	Bottom roll diameter	
5.4	Side roll diameter	
5.5	Max plate thickness that can be rolled (YS-360N/mm ²) length 3000mm	
5.6	Max plate thickness that can be pre-bend (YS-360N/mm ²) length 3000mm	
5.7	Hydraulic system and make	
5.8	Roller parallelism to min 0.05mm	
5.9	Planetary side roll guiding system	
5.10	CNC rolling system and cone forming	
6.0	Performance of the Machine (Please tick the appropriate option)	Not Satisfactory
		Average
		Good
		Satisfactory
7.0	Service after sales (Please tick the appropriate option)	Not Satisfactory
		Average
		Good
		Satisfactory
8.0	Other remarks (if any)	
Date:		Signature & Seal of the Authority Issuing the Performance Certificate

PART - B: Technical Specification**Note:-**

1. The Column “**Vendor’s offer with Technical details**” in this specification 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.

Name & Address of the Supplier:	Name & Address of the Indian agent(if any)
Telephone no.:	Telephone no.:
Fax no.:	Fax no.:
e-mail:	e-mail:

Scope: - Supply, Erection & Commissioning of **CNC 4 Roll Plate Rolling machine** for BHEL complying with the specification as below.

S no	Technical Specification	Technical parameters	Vendor’s offer with Technical details
1.0	Purpose & Work Piece Material		
1.1	Purpose: Plate Rolling and cone forming of plates of different material	Vendor to confirm	
1.2	Work Piece Material: Carbon Steel, Alloy Steel. Stainless steel and other materials which can be formed in the capacity of machine	Vendor to confirm	

S no	Technical Specification		Vendor's offer with Technical details
2.0	Specification		
2.1	MACHINE CONFIGURATION: The rolling machine shall be able to roll plates and form cones. The machine shall be 4 roll rolling with both CNC and manual control. All drives and force generation shall be hydraulic. Electronic parallelism system to be provided. Bottom and side rolls shall be tiltable in both sides to conveniently do the cone rolling. Use of hydraulic motors fitted with heavy duty planetary gear boxes for the rotation of rollers. Use of planetary guides with heavy duty pivots to guide the movement of side rolls. Use of side supports for supporting the plates on the machine. Use of extra heavy duty permanent lubricated self-aligning spherical roller bearings. Hydraulic yoke movement. 56-60 HRC, induction hardened, ground finish rolls crowned to compensate deflection. Suitable hydraulic power pump and filter unit with all its accessories shall be supplied with machine.	Vendor to confirm and explain the offered machine in detail	
2.2	CONSTRUCTION: Vendor to furnish details of material, hardness & constructional details including explanatory drawings of various components/ and assemblies of the whole machine; method of operation and control. Necessary lifting hook shall be provided for easy and safe transportation of machine from place to place within the shop floor.	Vendor to confirm and explain the offered machine in detail	
2.3	CAPACITY AND SIZE		
2.3.1	Yield strength of steel considered for deciding machine capacity shall be min. 360N/mm ²	Vendor to Confirm and Specify (C&S)	
2.3.2	UTS of steel considered for deciding machine capacity shall be min. 500N/mm ²	Vendor to (C&S)	
2.3.3	Plate rolling length (maximum) shall be Max. 3000mm	Vendor to (C&S)	
2.3.4	Machine rolling length shall be Min. 3100mm	Vendor to (C&S)	
2.3.5	Nominal plate thickness for rolling shall be min.30mm	Vendor to (C&S)	
2.3.6	Nominal rolling diameter, ID shall be min. 2050mm for 30mm thickness	Vendor to (C&S)	

2.3.7	Nominal rolling diameter, ID for 24mm thick, 3000mm in length plate shall be 620mm	Vendor to (C&S)	
2.3.8	Working in pre bending mode, ID for 22mm thick, 3000mm in length plate shall be min. 2000mm	Vendor to (C&S)	
2.3.9	Working in pre bending mode, ID for 18mm thick, 3000mm in length plate shall be 620mm	Vendor to (C&S)	
2.3.9.1	Max. thickness of plate that can be rolled to 600 mm ID	Vendor to specify	
2.3.10	Diameter of top roll shall be Min. 410 mm	Vendor to (C&S)	
2.3.11	Diameter of bottom roll shall be Min. 380 mm	Vendor to (C&S)	
2.3.12	Diameter of side rolls shall be Min. 325 mm	Vendor to (C&S)	
2.3.13	Total no. of rolls shall be 4	Vendor to (C&S)	
2.3.14	Driven rolls shall be 2 (top & bottom)	Vendor to (C&S)	
2.3.15	Type of drives for driven rolls: Independent hydraulic motors with planetary gear boxes for each roll and shall be directly connected.	Vendor to (C&S)	
2.3.16	Minimum applied force at bottom roll shall be Min. 225 Tons	Vendor to (C&S)	
2.3.17	Minimum applied force by side rolls for pre-bending shall be Min.110 Tons	Vendor to (C&S)	
2.3.18	Minimum applied drive torque	Vendor to specify	
2.3.19	Rolling speed shall be upto 6M/min	Vendor to (C&S)	
2.3.20	Adjustment speed, bottom roll shall be min. 375mm/min	Vendor to (C&S)	
2.3.21	Adjustment speed, side rolls shall be min. 975mm/min	Vendor to (C&S)	

2.3.22	Roll speed control shall be Hydraulic infinitely variable	Vendor to (C&S)	
2.3.23	Automatic speed compensation between the top and bottom rolls shall be through digital and proportional valves	Vendor to (C&S)	
2.3.24	Reversing of the rotation direction shall be through reversing of hydraulic motors	Vendor to (C&S)	
2.3.25	All rolls shall be hardened, ground and polished, Induction hardened having hardness 56-60 HRC	Vendor to confirm & specify in detail	
2.3.26	All rolls shall have accurate crowning to compensate for deflection	Vendor to specify in detail	
2.3.27	Lower roll position control shall be hydraulic with digital control	Vendor to (C&S)	
2.3.28	Lower roll and side roll parallelism control shall be through hydraulic and CNC digital control system and high precision linear encoders	Vendor to (C&S)	
2.3.29	Operation of side rolls shall be through hydraulic and CNC digital control system and high precision guiding through heavy duty planetary guides. No torsion bars	Vendor to (C&S)	
2.3.30	Out of parallelism of any two rolls shall not be more than max. 0.05mm	Vendor to (C&S)	
2.3.31	Cone bending feature shall be hydraulic and CNC controlled. Vendor to specify plate thickness, width and angle to be formed	Vendor to (C&S)	
2.3.32	Rising of top roll after tilting of drop end shall be hydraulic and lockable	Vendor to (C&S)	
2.3.33	All bearings shall be self-aligning, high precision, double crown, life time lubricated, heavy duty spherical roller of SKF make	Vendor to (C&S)	
2.3.34	Max hydraulic pressure at cylinders:	Vendor to specify	
2.3.35	The 3 adjustable rolls shall move in position through heavy duty chromium plated hydraulic cylinders	Vendor to (C&S)	
2.3.36	Min./max. oil delivery capacity of hydraulic pump	Vendor to specify	

2.3.37	The whole hydraulic system shall be of Rexroth, Yuken or Vickers make	Vendor to (C&S)	
2.3.38	The oil chiller shall be scope of hydraulic power unit	Vendor to (C&S)	
2.3.39	Hydraulic Operating of drop end: (Yoke)	Vendor to (C&S)	
2.3.40	Energy saving system: During re-rolling the bottom roll shall drop down and the oil shall be diverted to top one for increased speed of rolling	Vendor to (C&S)	
2.3.41	Hydraulic overhead support of capacity min. 8 Tons	Vendor to (C&S)	
2.3.42	Side support with rollers of 1.5M length at feeding side to sustain max. plate load and shall ease plate feeding	Vendor to (C&S)	
2.3.43	Display unit shall be min. 15” colour TFT LCD Flat screen	Vendor to (C&S)	
2.3.44	CNC System : min. 7 axes control, open Industrial control system with built in time proven 3D rolling machine control software of OEM make.	Vendor to specify	
2.3.45	CNC drives and motors used shall be from reputed international make such as Siemens, Fannuc, Rexroth, Yasakawa or Baummuller.	Vendor to (C&S)	
2.3.46	CNC controller shall of Siemens, Fannuc or OEM make.	Vendor to (C&S)	
2.3.47	Scales and encoders shall be of Heidenhein make	Vendor to (C&S)	
2.3.48	Capabilities of CNC System : The system shall have the features like capability to program the forming with the help of inbuilt library, calculate and determine the job feeding, prebending, rolling, unloading, cone forming sequence etc, automatic adjustment for the rolling allowance as per the empirical values already defined in the software, automatic adjustment of all the required axes for any forming.	Vendor to specify all features in detail	
2.3.49	System shall show all CNC related and machine problems in plain English language. System shall have soft keys for the selection of specific operations on each display.	Vendor to specify all features in detail	
2.3.50	It shall be possible to view the list of program.		
2.3.51	Feature of 2D and 3D simulation for rolling both during checking as well as during production.		

2.3.52	Graphic display of full processing zone etc. in different colours, Zooming facility.																																										
2.3.53	CNC system which gives automatic rolls and overload protection system.																																										
2.3.54	The system shall have all the features job counters, time study for each job, machine run hours, power used, etc.																																										
2.3.55	<p>Additional information</p> <p>Pre-bending capacity with straight end:</p> <table border="1" data-bbox="790 443 1125 1435"> <thead> <tr> <th>S. No.</th> <th>Pre-bending capacity with straight end</th> <th>360N/mm² yield strength Steel Plate thickness in mm</th> <th>270N/mm² yield strength Steel Plate thickness in mm</th> </tr> </thead> <tbody> <tr><td>1.</td><td>1.00 x plate thickness</td><td></td><td></td></tr> <tr><td>2.</td><td>1.25 x plate thickness</td><td></td><td></td></tr> <tr><td>3.</td><td>1.50 x plate thickness</td><td></td><td></td></tr> <tr><td>4.</td><td>2.00 x plate thickness</td><td></td><td></td></tr> <tr><td>5.</td><td>2.50 x plate thickness</td><td></td><td></td></tr> <tr><td>6.</td><td>3.00 x plate thickness</td><td></td><td></td></tr> </tbody> </table> <p>Circular bending capacity : _____</p>	S. No.	Pre-bending capacity with straight end	360N/mm ² yield strength Steel Plate thickness in mm	270N/mm ² yield strength Steel Plate thickness in mm	1.	1.00 x plate thickness			2.	1.25 x plate thickness			3.	1.50 x plate thickness			4.	2.00 x plate thickness			5.	2.50 x plate thickness			6.	3.00 x plate thickness				Vendor to specify												
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5.5	Motors shall conform to IEC or Indian Standards	Vendor to confirm	
5.6	All cables and cable trays required for the machine shall be included in the offer.	Vendor to confirm	
5.7	Vendor shall ensure that the machine and its peripherals are properly earthed.	Vendor to confirm	
5.8	The electrical components used shall be from reputed international make such as Siemens / Telemecanique / Merlin Genn / GE/ ABB and shall be in accordance with DIN/IEC Standards .	Vendor to confirm	
6.0	Safety Arrangements: Following safety features in addition to other standard safety features should be provided on the machine:		
6.1	Machine shall have adequate and reliable safety interlocks / devices to avoid damage to the machine, work piece and the operator due to malfunctioning or mistakes.	Vendor to confirm	
6.2	A detailed list of safety alarms / indications provided on machine should be submitted by the supplier.	Vendor to confirm	
6.3	Emergency Switches at suitable locations as per International Norms should be provided.	Vendor to confirm	
7.0	Environmental Performance of the Machine: The Machine shall conform to following factors related to environment safety:		
7.1	Maximum noise level shall be 80 dB (A) at normal load condition, 1 m away from the machine with correction factor for back ground noise, if necessary. This will be measured as per international standards like DIN 45635-16 . Supplier to demonstrate compliance to noise level, if so required.	Vendor to confirm	
7.2	If any safety / environmental protection enclosure is required it shall be built in the machine by the vendor.	Vendor to confirm	
7.3	Paint of the machine shall be oil resistant and shall not peel off.	Vendor to confirm	
8.0	Tools for Erection, Operation & Maintenance		
8.1	Special tools and equipment required for erection of the machine shall be brought by the vendor. Necessary tools like Torque Wrench, Spanners, Keys, grease guns etc. for operation and maintenance of the machine shall be supplied by the vendor. List of such tools shall be submitted with the offer.	Vendor to confirm	
9.0	Essential Accessories: Tooling		

9.1	All essential accessories shall be supplied with the machine. A list of all accessories shall be submitted with the offer.	Vendor to offer	
10.0	Spare		
10.1	Complete parts manual. Itemized breakup list of mechanical, hydraulic, electrical & electronic and CNC spares used in the machine 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, in addition to other recommended spares (Unit Price of each item of spare should be offered in the price bid)	Vendor to specify	
10.2	Mechanical & Hydraulic Spares: All types of Valves, Pressure Switches, Transducers, Flow Switches, Filters, Seals, O-rings, Hydraulic Hoses etc.	Vendor to specify	
10.3	Electrical & Electronic Spares: All types of Relays, Contactors, Proximity Switches, Limit switches, Push Buttons, Indicating Lamps, Semiconductor Fuses, Special Fuses, Circuit Breakers, Main Power Switch etc.	Vendor to specify	
10.4	All types of spares for total machine and accessories should be available for at least 10 years after supply of the machine. If the machine 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 specify	
10.5	The complete list of spares for machine and accessories, along with specification / type / model, name & address of the spares supplier along with documentation, to be supplied with the machine.	Vendor to confirm	
11.0	Documentation: Four sets of following documents (Hard copies) in English language should be supplied along with the machine	Vendor to confirm	
11.1	Operating manuals of Machine	Vendor to confirm	

11.2	Full details of Control system along with diagnostic/trouble shooting details, maintenance manuals for control system comprising of interface circuit, mounting instructions, trouble shooting, drive circuit diagrams, etc. Drawings for control schematics and electronic modules, electrical wiring, pneumatic and hydraulic system, lubrication details, spare parts manual including their pictorial views as applicable showing each part identified by a number. All CNC concerned manuals like Installation manual, Connecting manual, Diagnostic manual, Parameter manual, programming manual PLC manual, circuit diagram & PLC ladder diagram, Interfacing manual, Complete software backup and hard copy of the PLC program also on CD; CNC machine data, setting data and machine alarms to be provided. Two sets of each of these are to be forwarded within six weeks from the date of placing the purchase order.	Vendor to confirm	
11.3	Detailed Maintenance manual of machine with all drawings of machine assemblies/sub-assemblies/parts including Electrical / Pneumatic/ Hydraulic circuit diagrams and all assembly/Sub Assembly Drawings shall be supplied with the parts list.	Vendor to confirm	
11.4	Catalogues, O&M Manuals of all bought out items including drawings, wherever applicable should be provided by the vendor.	Vendor to confirm	
11.5	Detailed specification of all rubber items and hydraulic/lube fittings	Vendor to confirm	
11.6	Complete Master List of parts used in the machine shall be submitted by the vendor,	Vendor to confirm	
11.7	Spare parts list		
11.8	One additional set of all the above documentation in soft copy	Vendor to confirm	
12.0	Training		
12.1	Four BHEL Persons shall be trained at supplier's works for mutually agreed period in the area of (a) CNC Programming/Technology, Use of all CNC Features, Programming for Measuring Systems & supplied accessories etc. (b) Electrical, Electronic & CNC maintenance for machine & other supplied equipment (c) Mechanical & Hydraulic maintenance of the machine & other supplied equipment (d) Operation of the machine & other supplied equipment. (e) for advanced features and specialised training if so required by BHEL Supplier to quote for man/week basis	Vendor to agree	
12.2	Training of BHEL machine operators in operation of complete machine & accessories etc by the	Vendor to agree	

	supplier's experts / engineers during their stay at BHEL works.		
12.3	Two weeks supervision of independent operation of machine by BHEL after job prove out.	Vendor to agree	
12.4	Air-fare, boarding & lodging for the trainees shall be borne by BHEL.		
12.5	Competent, English speaking experts shall be arranged by the vendor for satisfactory & effective training of BHEL personnel.	Vendor to agree	
12.6	Vendor to quote for training duration on a per man day basis.	Vendor to note	
13.0	Erection & Commissioning		
13.1	Supplier to take full responsibility for carrying out the erection, start up, testing of machine. Its control & all types of other supplied equipment, machining of test pieces etc. Service requirement like power, air & water shall be provided by BHEL at only one point as indicated by the supplier in their foundation / layout drawings. All material handling and other requirements like crane and helping personnel shall be arranged by the vendor. Details of these requirements should be informed by the vendor in advance.	Vendor to note	
13.2	Successful trial of the machine by supplier at BHEL on trial components shall be considered as part of commissioning. All tests as mentioned in Clause 15.0 (Machine Acceptance) shall form part of the commissioning activity.	Vendor to note	
13.3	Tools Tackles and other necessary equipments required to carry out above activities shall be brought by the supplier.	Vendor to note	
13.4	Commissioning spares, required for commissioning of the machine within stipulated time, shall be brought by the supplier on returnable basis	Vendor to note	
13.5	Any portion of the machine, accessories and other supplied items where if paint has rubbed or peeled off during transit or erection should be repainted and merged with the original surrounding paint by the vendor, for this purpose. The vendor should supply sufficient quantity of touch-up paint of various colours of paints used.	Vendor to note	
13.6	Schedule of Erection and Commissioning shall be submitted with the offer.	Vendor to submit	
13.7	Charges, duration, terms & conditions for E&C should be furnished in detail along with the offer	Vendor to submit	
14.0	Geometrical Accuracies		
14.1	The machine shall be tested for Geometrical Accuracy as per relevant ISO Standard or Equivalent Standard at supplier works	Vendor to confirm	

15.0	Machine Acceptance (Tests/Activities to be Performed & Demonstrated by the Vendor)	Vendor to confirm	
15.1	Tests/Activities to be carried out at Vendor's works on the machine before dispatch		
15.1.1	The vendor shall inform the various standards (testing, measurements, motors, workmanship) applicable for this machine acceptance. Standards shall be Indian / International.	Vendor to furnish	
15.1.2	Data sheet of all machine parameters	Vendor to submit	
15.1.3	Internal routine test report	Vendor to submit	
15.1.4	Quality plan for final factory inspection to BHEL review.	Vendor to submit	
15.1.5	The machine shall be tested for its full capacity at supplier works. Test piece shall be arranged by the supplier only.	Vendor to accept	
15.2	Tests/Activities to be carried out at BHEL works while commissioning the machine		
15.2.1	The machine shall be tested for its full capacity at BHEL works. BHEL will supply the trial components for testing at BHEL	Vendor to accept	
15.2.2	Demonstration of all features of the machine & accessories if any to the satisfaction of BHEL for efficient and effective use of the machine.	Vendor to accept	
16.0	Packing: Sea worthy & rigid packing for all items of complete machine & accessories to avoid any damage/loss in transit. When machine is despatched, all small loose items shall be suitably packed in boxes	Vendor to accept	
17.0	Guarantee: 24 months from the date of commissioning of the machine. Free replacement of any defective part or service with additional 12 months guarantee on replaced item.	Vendor to accept	
18.0	General		
18.1	Machine Model	Vendor to furnish	
18.2	Total connected load (KVA)	Vendor to furnish	
18.3	Floor area required (Length × Width × Height) for complete machine & accessories.	Vendor to furnish	
18.4	Painting of Machine / Electrical Panels shall be Apple green, to colour code RAL 6011 (polyurethane)	Vendor to note	
18.5	Total weight of the machine	Vendor to furnish	
18.6	Weight of heaviest part of the machine	Vendor to furnish	
18.7	Weight of the heaviest assembly / sub-assembly of the Machine	Vendor to furnish	
18.8	Dimensions of largest part/ sub-assembly/ assembly of the machine	Vendor to furnish	

18.9	Detailed catalogues, sketch/ photographs of the m/c and accessories/attachments should be submitted with the offer.	Vendor to submit	
18.10	Hydraulic Pneumatic & oil piping should be preferably metallic except places where flexible piping is essential. All the pipes required for the same shall be included in the standard scope of the machine.	Vendor to note	