



# 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 78 30

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Email : [skaruna@bheltry.co.in](mailto:skaruna@bheltry.co.in)

Web : [www.bhel.com](http://www.bhel.com)

### TWO PART BID

Tender to be submitted in two parts.

#### Enquiry

Number:

**2621200017**

#### Enquiry

Date:

**31.01.2012**

#### Due date for submission

of quotation:

**01.03.2012**

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 (Item required at BHEL on)
10	<b>Horizontal Milling Machine for PPPU Unit at Thirumayam</b> as per the technical specification, general guidelines instructions & commercial conditions applicable (to be downloaded from web site <a href="http://www.bhel.com">www.bhel.com</a> or <a href="http://tenders.gov.in">http://tenders.gov.in</a> )	<b>01 No.</b>	<b>25.05.2012</b>

### Important points to be taken care during submission of offer

1. Checklist to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.
2. Subsequent to the hosting of this Enquiry, any corrigendum to the Enquiry will be hosted in the BHEL Web-site only. Hence BHEL Portal shall be viewed by the vendors regularly to know the details of corrigendum. In case if any vendor without seeing the corrigendum quoted as per original Enquiry and intimate that they have wrongly quoted will not be considered and rejected. However as per the appropriate Policy of BHEL action will be taken on them in this regard.

BHEL's General guidelines / instructions (refer MM/CE/GT/001) 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 referred above.

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 / MM / Capital Equipment

**QUALIFYING CRITERIA for HORIZONTAL MILLING MACHINE**

S. No.	SPECIFICATION	REQUIREMENTS	BIDDER's RESPONSE
1.0	<b>REFERENCE LIST / QUALIFYING CONDITIONS:</b>		
1.1	Only those Bidders (Original Equipment Manufacturers), who have supplied and commissioned at least two number of Horizontal Milling Machine of same (Table Traverses, Load Carrying Capacity) or higher sizes, in the past five years and such machines shall be presently working satisfactorily for more than one year (from the date of commissioning) , should participate & quote in this tender.	Vendor to comply	
2.0	The following information should be submitted by the Bidder about the companies where the above referred machines have been supplied. This is required from all the Bidders for qualification of their offer.	Vendor to comply	
2.1	Name of the customer /company where similar machine is installed.	Vendor to furnish	
2.2	Complete Postal Address of the Customer(s) using bidder's machines of similar specifications	Vendor to furnish	
2.3	Year of commissioning of the machines listed under the above Clause No.1.1.	Vendor to furnish	
2.4	Name and designation of the contact person of the bidder's customer(s) for correspondence by BHEL.	Vendor to furnish	
2.5	Telephone, FAX Number and E-Mail Address of the Contact Persons	Vendor to furnish	
2.6	P.O. Copy and the Commissioning Report of the referred machine(s) under Clause No.1.1.	Vendor to furnish	
2.7	A reference letter from the client on the client's letter head indicating the model of the machine supplied, table size of the machine, spindle power , commissioning date and it's present performance should be enclosed with the offer.	Vendor to furnish	

## Technical specification for Horizontal milling machine for PPPU/Tirumayam

SL. NO.	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER with technical details
1	PURPOSE & WORKPIECE MATERIAL		
1.1	PURPOSE: The machine is intended for machining ferrous & non - ferrous, castings and forgings of valve and soot blower components.	Vendor to confirm	
2	CONFIGURATION: Knee Type Horizontal milling Machine	Vendor to confirm	
3	Construction: The machine should have a rigid construction suitable for heavy stock removal.	Vendor to confirm.	
3.1	Machine should be metric execution	Vendor to confirm	
4	TABLE	confirm	
4.1	Size of Table (L X B) : Approx 2000 x 350 mm	Vendor to specify	
4.2	Work piece Clamping area: Aprox 1400 mm x 300 mm	Vendor to confirm	
4.3	Max Weight of Work piece: Aprox 600 Kos	Vendor to confirm	
4.4	Details of T-Slots (No/Size/Pitch)	Vendor to specify	
4.5	Power operated traverses	Vendor to specify	
	Longitudinal- 1200 mm or more		
	Transverse / cross - 320 mm or more		
	Vertical - 425 mm or more		
4.6	Min distance from left hand table end to centre of spindle – Aprox 185 mm	Vendor to specify	
4.7	Load carrying capacity of table	Vendor to specify	
5	MILLING SPINDLE		
5.1	Taper in Spindle:	ISO 50	
5.2	Spindle Motor Power (AC Continuous Duty S1): The Spindle motor shall be of reputed make acceptable to BHEL(Details of model. make, type to be furnished in the offer.	Min 7.5 Kw	
5.3	Spindle Speed range: around 40 to 1800 RPM	Vendor to specify	
5.4	No of speed ranges : around 18	Vendor to specify	
5.5	Min/Max distance from spindle lower face to table top - 60/S00 mm	Vendor to specify	
5.6	Vertical Quill movement - min 70 mm	Vendor to specify	
5.7	Swiveling of Milling head - 45 deg on	Vendor to	

## Technical specification for Horizontal milling machine for PPPU/Tirumayam

	either side	specify	
6	FEEDS	Vendor to specify	
6.1	Rapid feeds - Longitudinal, cross & vertical	Vendor to specify	
6.2	Cutting Feed range: Longitudinal & Cross travel - around 20 to 1500 mm/min Vertical travel - around 4 to 300 mm/min	Vendor to specify	
6.3	Feed drives shall be through AC servo motors. Vendor to furnish details of the make, rating and model no of the AC servo motors and the AC servo drives with the offer.	Vendor to specify and furnish the details.	.
6.4	Details of the feed mechanism for the longitudinal, cross and vertical movements to be furnished in the offer.	Vendor to furnish.	.
7.0	MACHINE LIGHTS		
7.1	Machine Lights for sufficient illumination should be provided for clear visibility,	Vendor to confirm	
7.2	Light fittings. Consumables. Adapters/receptacles should have compatibility with Indian equivalents.	Vendor to confirm	
8.0	Lubrication System		
8.1	Lubrication system. preferably centralized . for lubrication of all rotating & moving parts, guide ways lead screws, gears spindle etc	Vendor to specify	
8,2	First filling of all required oils & Grease etc should be supplied by vendor	Vendor to specify	
9.0	COOLANT SYSTEM:		
9.1	Re-circulating flood coolant system with filtration to filter chips and swarf.	Vendor to specify	
9.2	Coolant collection and recirculation system should be leak proof to avoid spillage on shop floor.	Vendor to confirm	
9.3	Coolant pump & motor details are to be submitted with the offer	Vendor to confirm	
9.4	Coolant Tank Capacity	Vendor to specify	
10.0	ELECTRICAL:		

## Technical specification for Horizontal milling machine for PPPU/Tirumayam

10.1	415V +- 10%, 50 HZ +- 3 HZ, 3 Phase AC (3 wire system without neutran.Power Supply will be provided by BHEL at a single point near the machine. as per the 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 machine/control cabinets, shall be the responsibility of the vendor .Requirement of grounding/earthing with required material details is to be informed by vendor well in advance so that the same could be incorporated during construction of foundation	Vendor to confirm	
10.2	Tropicalisation : All electrical/electronic equipment shall be tropicalized,	Vendor to confirm	
10.3	All electrical & electronic control cabinets & panels should be dust and vermin proof and shall have IP 54 protection.	Vendor to confirm	
10.4	All electrical components in the cabinets should be mounted on DIN Rail.	Vendor to confirm	
10.5	Motors & drives shall be of ABB/SIEMENS/Mitsubishi/any other reputed make acceptable to BHEL.	Vendor to confirm	,
10.6	Vendor should ensure proper earthing for the machine and its peripherals.	Vendor-to confirm	
11,0	SAFETY ARRANGEMENTS		
11.1	Machine should have adequate and reliable safety interlocks or devices to avoid damage to the machine, work piece and the operator due to the malfunctioning or mistakes	Vendor to confirm	
11.2	, All the pipes. cables etc on the machine should be well supported and protected. These should not create any hindrance to machine operator's movement for effective use of machine.	Vendor to confirm	
11.3	All the rotating parts used on the machine should be statically & dynamically balanced to avoid undue vibrations,	Vendor to confirm	
11.4	Emergency Switches at suitable locations as per International Norms should be provided.	Vendor to confirm	

## Technical specification for Horizontal milling machine for PPPU/Tirumayam

12.0	ENVIRONMENTAL PERFORMANCE OF THE MACHINE:		
12.1	Maximum noise level shall not exceed 85 dB(A) at normal load condition, 1 meter away from the machine.	Vendor to confirm	
12.2	There shall not be any emissions from the machine except fumes of cutting fluid during machining.	Vendor to confirm	
12.3	There should not be any <i>effluent</i> from the machine. In case there are any effluents from the machine, requisite effluent treatment plant or pollution control device should be built into the machine by the supplier.	Vendor to confirm	
12.4	No hazardous chemicals shall be used in the machine.	Vendor to confirm	
12.5	If any safety / environmental protection enclosure is required, it should be built in the machine by the vendor.	Vendor to confirm	
12.6	Paint of the machine should be oil / coolant resistant and should not peel off and mix up with coolant.	Vendor to confirm	
13.0	TOOLINGS		
13.1	Adaptors for Milling : The vendor shall supply the following milling adaptors(Screwed end) a) ISO 50: MT 4 - 2 Nos b) ISO 50 : MT 3(S) - 2 Nos c) ISO 50: MT 2(5) - 2 Nos d) ISO 50 : Adaptors for face/ shoulder mills with ID – 22, 27, 32, 40 each one No	Vendor to confirm	
14.0	LEVELING & ANCHORING SYSTEM		
14.1	Complete anchoring system including foundation bolts. Anchoring steel materials, fixators, leveling shoes etc to be supplied.	Vendor to confirm	
15.0	TOOLS FOR OPERATION & MAINTENANCE		
15.1	Necessary tools like Torque Wrench, Spanners, Keys, grease guns etc for operation and maintenance of the machine should be supplied. List of such tools should be submitted with offer.	Vendor to confirm	
16.0	ACCESSORIES		
16.1	Vertical milling attachment <b>(Vertical milling attachment the mandatory requirement.</b>	Vendor to specify	

## Technical specification for Horizontal milling machine for PPPU/Tirumayam

	<u>Hence the Offer is acceptable only with vertical milling attachment otherwise the offer will not be considered )</u>		
16.2	Universal dividing head with tailstock	Vendor to specify	
16.3	Box type Table Size =600x500x500mm approx – one no	Vendor to specify	
16.4	Machine vice 200mmn	Vendor to specify	
17.0	SPARES:		
17.1	1} The Vendor shall recommend and submit list of spares required for the machine for two years of trouble free operation on three Shifts I day basis under two headings as a)Mechanical Spares and b) Electrical & electronic spares. 2} Un-priced list of spares with quantities. Specified at a & b above, should be submitted with this technical offer.	Vendor to submit	
17.2	All types of spares for the total machine and its accessories should be available for minimum ten years, after supply of the machine. If any spares or controls are likely to become obsolete within this period, the vendor should inform BHEL and provide details of its suppliers to enable BHEL to procedure them in advance.	Vendor to confirm	
17.3	In case of ordering a complete list of spares for the machine and its accessories along with the spares specification /type/ model and name& address of the spare supplier shall be submitted along with the documentation while supplying the machine.	vendor to confirm	
18.0	DOCUMENTATION:		
18.1	Along with the offer the vendor should furnish a dimensioned layout drawing of the machine & its accessories.	vendor to confirm	
18.2	3 sets of following documents (3 Hard copies) in English language should be supplied along with the machine.	Vendor to confirm	
18.2.1	Operating Manuals of Machine		

## Technical specification for Horizontal milling machine for PPPU/Tirumayam

18.2.2	Detailed Maintenance manual of machine with all drawings of machine assemblies/sub assemblies/parts including electrical/lubrication/ coolant circuit diagrams.	Vendor to confirm	
18.2.3	Catalogues /O & M Manuals of all bought out items	Vendor to confirm	
18.2.4	Detailed specification of all fittings	Vendor to confirm	
18.2.5	Bearings: Make & Specification for all bearings used in the machine	Vendor to specify	
18.2.6	PLC Program printouts (Ladder Diagram & Statement list) with comments in English - if Machine incorporates PLC Controls.	Vendor to confirm	
18.2.7	PLC Program & PLC data on CD - if Machine incorporates PLC Controls.	Vendor 10 confirm	
18.2.8	The Vendor shall submit complete Master list of parts used in the machine.	Vendor to Submit.	
18.3	One additional set of all the above documents on CD ROM, wherever possible.	Vendor to confirm	
19.0	TRAINING:		
19.1	The Vendor shall train Three BHEL Engineers in Operation and Maintenance (Mechanical, Electrical/Electronics and CNC System) of the Machine at Vendor's works for a period not exceeding 3 working days.	Vendor to confirm	
19.2	Travel fare boarding & 10dginQ for the BHEL Engineers shall be borne by BHEL		
19.3	The Vendor shall impart training to BHEL's Machine Operators and Maintenance crew in Operation and Maintenance after the commissioning of the Machine at BHEL works for not less than 6 working days	Vendor to confirm	
19.4	Competent, English speaking experts shall be arranged by the Vendor during training for satisfactory & effective training of BHEL personnel	Vendor to confirm	
19.5	Vendor to quote on the basis of per man per day for training at vendor's works	Vendor to specify	
20.0	FOUNDATION.		

## Technical specification for Horizontal milling machine for PPPU/Tirumayam

20.1	Vendor shall submit the preliminary layout drawing for getting BHEL's approval within one month from the date of letter of intent (LOI). Vendor shall submit complete foundation details including static and dynamic loads within three months after getting BHEL's approval. The layout should consist of all requirements pertaining to complete machine including space requirement for accessories. BHEL shall construct complete foundation of the machine.	Vendor to confirm	
20.2	The Vendor shall indicate detailed specifications of grouting compound and Grouting procedure etc for foundation bolts of the machine.	Vendor to specify	
21	<b>ERECTION &amp; COMMISSIONING</b>		
21.1	1. Supplier to take full responsibility for supervision of the erection. Start up, testing of machine, its control system & all types of other supplied equipment, machining of test pieces etc are the responsibility of the supplier. 2. Service requirement like power, air & water shall be provided by BHEL at only one point to be indicated by supplier in their foundation/ layout drawings. 3. Other requirements like crane & helping personnel shall also be provided by BHEL, free of cost.	Vendor to confirm	
21.2	Tools, Tackles, Test Mandrels, instruments and other necessary equipment required to carry out all above activities should be brought by the supplier.	Vendor to confirm	
21.3	The supplier shall arrange commissioning spares required for commissioning of the machine.	Vendor to confirm	
21.4	Portion, if any, of the machine, accessories and other supplied items where paint has rubbed off or peeled 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 colors of paint used.	Vendor to confirm	

## Technical specification for Horizontal milling machine for PPPU/Tirumayam

21.5	Schedule of erection and commissioning shall be submitted with the offer	Vendor to confirm	
21.6	Duration. Terms & conditions for E&C should be furnished with this technical offer in detail. Charges for the same shall be submitted with the Price bid.	Vendor to confirm	
22.0	ACCURACY TESTS:		
22.1	GEOMETRICAL ACCURACY:		
22.2	Geometrical Accuracy Tests shall be in accordance with manufacturer's standard. Detailed Test Charts for the same, clearly showing the accuracies to be achieved on the machine, shall be submitted with the offer.	Vendor to confirm	
22.3	All the above accuracies to be demonstrated to BHEL engineers during pre-acceptance tests at Suppliers works and during Erection & Commissioning at BHEL works.	Vendor to confirm	
23.0	AMBIENT CONDITIONS & THERMAL STABILITY:		
23.1	Power Supply: AC 415 V +- 10% Frequency: 50 Hz +- 3 Hz Phases: 3 Phase 3 Wire System Compressed air supply: 60-70 psi Ambient Temperature: MAX 45 \deg Relative Humidity: 85 % Vendor to confirm that the machine is suitable for above conditions.	Vendor to confirm	
23.2	Weather conditions are tropical. Atmosphere may be dust laden during some part of the year. Machine will be installed in the normal shop floor condition. Vendor to confirm that the machine is suitable for the above.	Vendor to confirm	
23.3	Thermal Stability of the machine shall be good enough to withstand the specified ambient conditions in order to meet the accuracy requirements of BHEL components Vendor to confirm for trouble - free operation of the machine.	Vendor to confirm	
23.4	The Vendor should confirm that the machine and its accessories is suitable for continuous operation at its full capacity for 24 hours a day and 7 days a week through out.	Vendor to confirm	

## Technical specification for Horizontal milling machine for PPPU/Tirumayam

24.0	MACHINE ACCEPTANCE: (Tests/Activities should be performed by the Vendor)		
24.1	Tests/Activities should be carried out at supplier's works on the machine before dispatch:		
24.2	Geometrical accuracies as per the test chart.		
24.3	The Machine should be tested for continuous running of 48 hrs.if any breakdown occurs during this test the test should be repeated for 48 hrs from start.	Vendor to confirm	
24.4	Demonstration of all features of the machine control system & accessories.	Vendor to confirm	
24.5	Machining of test piece. Vendor to supply test piece and tooling for its machining.	Vendor to confirm	
24.6	Tests/Activities should be carried out at BHEL works while commissioning of the machine:		
24.7	Geometrical accuracies as per the test chart.	Vendor to confirm	
24.8	The Machine should be tested for continuous running of 48 hrs.if any breakdown occurs during this test the test should be repeated for 48 hrs from start.	Vendor to confirm	
24.9	Demonstration of all features of the machine, control system & accessories for the efficient use of the machine.	Vendor to confirm	
24.1	Machining of test piece. Test pieces and tooling for its machining shall be arranged by BHEL.	Vendor to confirm	
25.0	PACKING:		
25.1	Rigid packing for all items of complete machine, all accessories and supplied items to avoid any damage /loss in transit. When the machine is dispatched in containers, all small loose items shall be suitably packed in boxes.	Vendor to confirm	
26.0	GUARANTEE:		
26.1	18 months from dispatch or 12 months from the date of acceptance of machine at BHEL.	Vendor to confirm	
27.0	GENERAL:		
27.1	Machine Model:	Vendor to specify	

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27.2	Total Connected load (KVA)	Vendor to specify	
27.3	Floor area required (Length, Width Height) for complete machine & accessories.	Vendor to specify	
27.4	Make of bought items to be furnished to BHEL for approval.	Vendor to confirm	
27.5	Painting of Machine / Electrical Panels: SYNTHETIC ENAMEL GLOSSY FINISH APPLE GREEN PAINT as per IS 5/1994. Shade (ISC) No : 281	Vendor to specify	
27.6	Total Weight of the machine.	Vendor to specify	
27.7	Weight of the Heaviest Dart of the machine.	Vendor to specify	
27.8	Weight of the Heaviest assembly / sub assembly of the Machine.	Vendor to specify	
27.9	Dimensions of largest Dart / sub assembly / assembly of the machine.	Vendor to specify	