



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 7421
Email : vkaruna@bhel.in
Web : www.bhel.com

TWO PART BID

Tender to be submitted in two Parts

Enquiry
Number:

2622000006

Enquiry
Date:

06.06.2020

Due date for submission of
quotation:

03.07.2020

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	(Indigenous Vendors) Matl. will be Delivered to
10	HORIZONTAL MILLING MACHINE as per the technical specification & commercial conditions applicable (to be downloaded from web site (http://www.bhel.com) http://www.bhel.com/tender/tender_home.php or https://eprocure.gov.in/epublish/app)	1.00 No.	FOR, BHEL Stores, High Pressure Boiler Plant, Tiruchirappalli - 620014

Important points to be taken care during submission of offer

1. Material shall be delivered to: Indigenous Vendors: As stated above.
Foreign Vendors: CFR Chennai Seaport / CPT Chennai Airport
2. Delivery required 4 Month including PDI from the date of purchase order.
3. Erection & Commissioning period required 4 Week from the date of intimation by BHEL to vendor for deputation of their Engineers for E&C.
4. EMD for this Tender will be (not less than): INR 40,000/-
5. Compliance Form Nos.: TRY/IND/07 to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.
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>) http://www.bhel.com/tender/tender_home.php or from the Government tender website <https://eprocure.gov.in/epublish/app> under above Enquiry reference.

(This is not an E-tender, please submit your offer in hard copies)

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**

DGM / Capital Equipment / MM

V. KARUNAKARAN
Dy. General Manager
Capital Equipment / MM
BHEL / Tiruchirappalli - 620 014

HORIZONTAL MILLING MACHINE, Qty. 1 no.

Part A - Qualifying Criteria

S. No	BHEL Specification	Bidder's Offer
1.0	QUALIFYING CRITERIA	
1.1	Bidder / OEM who have manufactured, supplied and commissioned at least ONE Knee type - Horizontal OR Universal Milling Machine in the last 10 years are eligible to quote.	
1.2	Bidder has to submit at least ONE Performance Certificate from their customer (end user), for satisfactory performance of Knee type - Horizontal OR Universal Milling Machine with Table clamping size of 1400mm x 300mm or higher meeting the following conditions: a) The Equipment must have been supplied within the last 10 years as on the first date of tender opening. b) The Equipment must have performed satisfactorily for at least one year during this period. For obtaining the Performance certificate, a suggestive format is provided at the end of part-A.	
1.3	PO document for the above mentioned supplied equipment to be enclosed	
1.4	BHEL reserves the right to verify the information provided by the Bidder. In case the information provided is found to be false/ incorrect, the offer is liable for rejection.	
2.0	INFORMATION TO BE PROVIDED BY BIDDER	
2.1	Bidder shall provide contact details(phone no & email id) including the address of his Agents / Service Centres in India	
2.2	Details of Horizontal/Universal milling machines supplied to other BHEL units if any	
2.3	The BIDDER to furnish Reference List of Customers (max 10 customers) including Contact details(phone no & email id).	
3.0	BIDDER to note	
3.1	The BIDDER shall submit the offer in Two Parts – 1. Technical [with PART A & PART B] & 2. Commercial and Price Bid.	
3.2	The Bidder's offer against each clause in PART A & B of the offer should be filled by the BIDDER compulsorily with complete details.	

S. No	BHEL Specification	Bidder's Offer
3.3	The BIDDER shall assure a continuous support for Spares and Service for Ten Years, from the date of commissioning of the equipment at BHEL Works.	
3.4	The Technical Offer shall be supported by Product Catalogue and Data Sheets in original and complete technical details / literature on the quoted model of equipment.	
3.5	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 to be produced **on Customer's Letter Head.**

PERFORMANCE CERTIFICATE

- 1 Make & Series of the equipment
- 2 Month & Year of Commissioning
- 3 Equipment type: Knee type - Horizontal Milling machine / Vertical Milling machine/Universal milling machine
(Strike off whichever is not applicable)
- 4 Table Clamping size:.....length x.....width
- 5 Application for which the equipment is used
- 6 Performance of the equipment Satisfactory / Not Satisfactory
(Strike off whichever is not applicable)
- 7 Service support after sales Satisfactory / Not Satisfactory
(Strike off whichever is not applicable)
- 8 Any Other remarks
- 9 This performance certificate was issued on: (DD/MM/YYYY)

Signature & Seal of the Authority
Issuing the Performance Certificate

Contact details of issuing authority

Name & Designation:

Office No/ Mobile no:

Email ID:

HORIZONTAL MILLING MACHINE, Qty. 1 no.

Part B – Technical Specification

SL. NO.	PARTICULARS AND BHEL SPECIFICATION			BIDDER'S OFFER with technical details															
1	PURPOSE & WORKPIECE MATERIAL																		
1.1	PURPOSE: The Horizontal Milling machine is intended for machining of small Components of various sizes having flat, irregular surfaces. The machining activities includes milling, step machining, slot cutting, notching etc		Bidder to confirm																
1.2	Job Material Detail: <table><tr><td>Material</td><td>Normal Hardness (HBW)</td><td>Hardness at Welded condition (HBW)</td></tr><tr><td>20MnMoNi55</td><td>220</td><td>330</td></tr><tr><td>SA-350 Gr.L F2</td><td>200</td><td>300</td></tr><tr><td>Stainless Steel</td><td>220</td><td>320</td></tr><tr><td>Ti-Alloy</td><td>230</td><td>320</td></tr></table>		Material	Normal Hardness (HBW)	Hardness at Welded condition (HBW)	20MnMoNi55	220	330	SA-350 Gr.L F2	200	300	Stainless Steel	220	320	Ti-Alloy	230	320	Bidder to confirm	
Material	Normal Hardness (HBW)	Hardness at Welded condition (HBW)																	
20MnMoNi55	220	330																	
SA-350 Gr.L F2	200	300																	
Stainless Steel	220	320																	
Ti-Alloy	230	320																	
1.3	Maximum Weight of the Job: 600Kgs		Bidder to confirm																
2.0	Machine type: Knee Type Horizontal Milling Machine		Bidder to confirm																
3.0	Construction: The machine should have a rigid construction suitable for smooth, vibration-free machining and heavy stock removal.		Bidder to confirm and to provide details																
3.1	Overarm with bracket, arbor, milling cutter, spacers etc.		Bidder to specify																
4.0	TABLE DETAILS																		
4.1	Size of Table (L X W): 2000mm x 350 mm Minimum		Bidder to specify																
4.2	Work piece Clamping area: 1400 mm x 300 mm Minimum		Bidder to confirm																
4.3	Details of T-Slots (No/Size/Pitch) - Preferably M20 standard. 3 or 5 slots to be provided in the table		Bidder to specify																
4.4	Electrically operated movement																		
4.4.1	Longitudinal - 1200 mm or more		Bidder to specify																
4.4.2	Transverse / cross - 320 mm or more		Bidder to specify																
4.4.3	Vertical: 425 – 450 mm		Bidder to specify																
4.5	Min distance from left hand table end to centre of spindle – Approx 180 mm		Bidder to specify																

SL. NO.	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER with technical details
4.6	Load carrying capacity of table: Not less than 600kg	Bidder to specify	
5.0	MILLING SPINDLE		
5.1	Spindle position: Horizontal	Bidder to confirm	
5.2	Taper in Spindle: ISO 50 /BT 50	Bidder to specify	
5.3	Spindle Motor type- AC Continuous Duty and IE2 or better to be provided.	Details of model. make, type to be furnished in the offer.	
5.4	Motor kW rating: minimum 7.5 kW.	Bidder to confirm and provide calculation details	
5.5	Motor make: ABB/SIEMENS/CROMPTON/GE/KEC/ BALDOR or any other make acceptable to BHEL.	Bidder to specify	
5.6	Spindle Speed range: 40 to 1800 RPM	Bidder to specify	
5.7	No of speed ranges: 18	Bidder to specify	
5.8	Min/Max distance from spindle centre to table top – around 70/500 mm	Bidder to specify	
6.0	TRAVERSE AND FEED RATE		
6.1	Rapid traverse		
6.1.1	Longitudinal travel in mm/min	Bidder to specify	
6.1.2	Cross travel in mm/min	Bidder to specify	
6.1.3	Vertical travel in mm/min	Bidder to specify	
6.2	Cutting Feed		
6.2.1	Longitudinal travel: around 20 to 1500 mm/min or better	Bidder to specify	
6.2.2	Cross travel - around 20 to 1500 mm/min or better	Bidder to specify	
6.2.3	Vertical travel - around 4 to 300 mm/min or better	Bidder to specify	
6.3	Feed drives shall be through AC Induction motors. Bidder to specify and furnish the details.		
6.4	Motor kW rating: Bidder to specify and provide calculation details		
6.5	Motor make: ABB/SIEMENS/CROMPTON/GE/KEC/ BALDOR or any other make acceptable to BHEL. Bidder to specify		
6.6	Details of the feed mechanism for the longitudinal, cross and vertical movements to be furnished in the offer.	Bidder to furnish	
7.0	MACHINE LIGHTS		
7.1	Machine Lights for sufficient illumination should be provided for clear visibility.24V LED light fitting preferred.	Bidder to confirm	

SL. NO.	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER with technical details
7.2	Light fittings, Consumables, Adapters/receptacles should have compatibility with Indian equivalents.	Bidder to confirm	
8.0	LUBRICATION SYSTEM		
8.1	Lubrication system. Centralized lubrication of all rotating & moving parts, guide ways lead screws, gears spindle etc. Details to be provided.	Bidder to specify	
8.2	First filling of all required oils & Grease etc should be supplied by bidder	Bidder to specify	
8.3	Hydraulic oil preferably of grade 68 or equivalent available in the Indian market to be specified	Bidder to specify	
8.4	Lubrication oil tank capacity in litres	Bidder to specify	
9.0	COOLANT SYSTEM		
9.1	Re-circulating flood coolant system with filtration to filter chips etc.	Bidder to specify	
9.2	Coolant collection and recirculation system should be leak proof to avoid spillage on shop floor.	Bidder to confirm	
9.3	Coolant pump & motor details are to be submitted with the offer	Bidder to confirm	
9.4	Coolant Tank Capacity in litres	Bidder to specify	
9.5	The coolant to be discharged into the built-in coolant tank in the machine base.	Bidder to specify	
9.6	Tray at the base for collection of chips and coolant	Bidder to specify	
9.7	Operator control panel should be located ergonomically. Bidder to provide the details of controls		
10.0	ELECTRICAL:		
10.1	Input power supply of 415V $\pm$ 10% V, 50 HZ $\pm$ 3 HZ, 3 Phase AC (3 wire system without neutral Power Supply will be provided by BHEL at a single point near the machine.	Bidder to note	
10.2	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 bidder.	Bidder to confirm	
10.3	Requirement of grounding/earthing with required material details is to be informed by bidder well in advance so that the same could be incorporated during construction of foundation	Bidder to confirm	

SL. NO.	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER with technical details
10.4	All electrical & electronic control cabinets & panels should be dust and vermin proof and shall have IP 54 protection.	Bidder to confirm	
10.5	All electrical components in the cabinets should be mounted on DIN Rail.	Bidder to confirm	
10.6	Bidder should ensure proper earthing for the machine and its peripherals.	Bidder to confirm	
10.7	Floor surface inside the panel should be free from mounting of any components/instruments	Bidder to confirm	
10.8	Digital Read Out System on all X,Y and Z axes (Longitudinal, vertical & cross travel) with suitable linear scales and scanner, with 0.005 mm resolution, for visualising table movement positions.	Bidder 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	Bidder 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.	Bidder to confirm	
11.3	All the rotating parts used on the machine should be statically & dynamically balanced to avoid undue vibrations.	Bidder to confirm	
11.4	Emergency Switches at suitable locations as per International Norms should be provided.	Bidder to confirm	
11.5	Suitable arrangement/covers for protecting the guide-ways from the ingress of chips.	Bidder to specify	
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.	Bidder to confirm	
12.2	If any safety / environmental protection enclosure is required, it should be built in the machine by the bidder.	Bidder to confirm	
12.3	Paint of the machine should be oil / coolant resistant and should not peel off and mix up with coolant.	Bidder to confirm	

SL. NO.	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER with technical details
13.0	TOOLINGS		
13.1	Adaptors for Milling: The bidder shall supply the following milling adaptors(Screwed end) a) ISO 50 / BT 50: MT 4 - 2 Nos. b) ISO 50 / BT 50: MT 3 - 2 Nos. c) ISO 50 / BT 50: MT 2 - 2 Nos. d) ISO 50 / BT 50: Adaptors for face/ shoulder mills with ID – 22, 27, 32, 40, 63 - 1 No. each e) Collet Holder (5mm-30mm) - 3 Nos. f) Face Mill cutter dia 125mm - 3 Nos. g) Shoulder Mill cutter Dia 65mm - 2 Nos.	Bidder to specify	
14.0	LEVELING & ANCHORING SYSTEM		
14.1	Complete anchoring system including foundation bolts. Anchoring steel materials, fixators, leveling shoes etc to be supplied.	Bidder to confirm	
14.2	BHEL will do grouting/Anchoring as per the layout provided by the supplier.	Bidder to note and confirm	
15.0	TOOLS FOR OPERATION AND 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.	Bidder to confirm	
16.0	ACCESSORIES		
16.1	Suitable provision to include a Vertical milling attachment (in future) must be available in the equipment to enable BHEL to procure and use the same in this machine in future if needed. Without this provision, the equipment is not acceptable.	Bidder to confirm	
16.2	Optional: A universal vertical milling head with 45 degree rotation on either side of vertical axis to be quoted separately.	Bidder to note	
16.3	Optional: Indexing Head suitable for Mounting both horizontally and vertically for direct indexing up to 24 divisions to be quoted seperately	Bidder to note	
16.4	Machine vice - Mechanical/ hydraulic with solid/ swivel base, jaw widths: 150 mm - 250 mm, jaw opening up to 300 mm	Bidder to specify	
16.5	Clamping kit consisting of T, coupling, flange nuts, step clamps and blocks etc.	Bidder to specify	

SL. NO.	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER with technical details
17.0	SPARES		
17.1	1) The Bidder shall recommend and submit list of spares required for the machine for two years of trouble-free operation on three Shifts per 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.	Bidder to submit	
17.2	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.	Bidder to confirm	
18.0	DOCUMENTATION		
18.1	Along with the offer the bidder should furnish a dimensioned layout drawing of the machine & its accessories.	Bidder to confirm	
18.2	Following listed Documents (3 Hard copies and 1 softcopy in Pendrive) in English language should be supplied along with the machine.		
18.2.1	Detailed Maintenance manual of machine with all drawings of machine assemblies/ subassemblies/parts including electrical/lubrication/ coolant circuit diagrams.	Bidder to confirm	
18.2.2	Catalogues /O & M Manuals of all bought out items		
18.2.3	Detailed specification of all fittings		
18.2.4	Bearings: Make & Specification for all bearings used in the machine		
19.0	TRAINING:		
19.1	The Bidder shall impart training to BHEL's Machine Operators and Maintenance crew in Operation and Maintenance during commissioning of the Machine at BHEL works.	Bidder to confirm	
19.2	Competent, English speaking experts shall be arranged by the Bidder during training for satisfactory & effective training of BHEL personnel	Bidder to confirm	
20.0	FOUNDATION		

SL. NO.	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER with technical details
20.1	Bidder shall submit complete foundation details including static and dynamic loads within one month after receipt of purchase order. The layout should consist of all requirements pertaining to complete machine including space requirement for accessories. BHEL shall construct complete foundation of the machine.	Bidder to confirm	
20.2	The Bidder shall indicate detailed specifications of grouting compound and Grouting procedure etc for foundation bolts of the machine.	Bidder to specify	
21.0	The equipment shall be offered for Inspection by BHEL at vendor's works prior to dispatch. Bidder to specify the number of days required for Pre Despatch Inspection (PDI). PDI charges if any shall be quoted by the bidder separately in their offer	Bidder to confirm	
22.0	ERECTION & COMMISSIONING		
22.1	a) 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. b) Service requirement like power, air & water shall be provided by BHEL at only one point near the machine c) Other requirements like crane & helping personnel shall also be provided by BHEL.	Bidder to confirm	
22.2	Tools, Tackles, Test Mandrels, instruments and other necessary equipment required to carry out all above activities should be brought by the supplier.	Bidder to confirm	
22.3	The supplier shall arrange commissioning spares required for commissioning of the machine.	Bidder to confirm	
22.4	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 bidder. For this purpose, the bidder should supply sufficient quantity of touch up paint of various colors of paint used.	Bidder to confirm	
23.0	ACCURACY TESTS:		

SL. NO.	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER with technical details
23.1	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.	Bidder to confirm	
23.2	All the above accuracies to be demonstrated to BHEL engineers during pre-acceptance tests at Suppliers works and during Erection & Commissioning at BHEL works.	Bidder to confirm	
24.0	AMBIENT CONDITIONS & THERMAL STABILITY		
24.1	Ambient Temperature: Max 45 deg Relative Humidity: 85 % Bidder to confirm that the machine is suitable for above conditions.	Bidder to confirm	
24.2	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. Bidder to confirm that the machine is suitable for the above.	Bidder to confirm	
24.3	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. Bidder to confirm for trouble - free operation of the machine.	Bidder to confirm	
24.4	The Bidder 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.	Bidder to confirm	
25.0	MACHINE ACCEPTANCE		
25.1	Tests/Activities should be performed by the Bidder during Pre dispatch Inspection:		
25.1.1	Geometrical accuracies as per the test chart.	Bidder to confirm	
25.1.2	Demonstration of all features of the machine control system & accessories.	Bidder to confirm	
25.1.3	Machining of test piece: Bidder to arrange sample test piece and tooling for its machining.	Bidder to confirm	
25.2	Tests/Activities should be carried out at BHEL works while commissioning of the machine:		
25.2.1	Geometrical accuracies as per the test chart.	Bidder to confirm	

SL. NO.	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER with technical details
25.2.2	Demonstration of all features of the machine, control system & accessories for the efficient use of the machine.	Bidder to confirm	
25.2.3	Machining of test piece: Test pieces and tooling for its machining will be arranged by BHEL. Milling/ slotting/ step machining will be performed on the test piece and required dimensional accuracy to be obtained as per bidder quality chart.	Bidder to confirm	
26.0	PACKING		
26.1	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.	Bidder to confirm	
27.0	GUARANTEE		
27.1	12 months from the date of commissioning of machine at BHEL works or 18 months from dispatch whichever is earlier	Bidder to confirm	
28.0	GENERAL		
28.1	Machine Make and Model	Bidder to specify	
28.2	Total Connected load (kVA)	Bidder to specify	
28.3	Floor area required (Length, Width and Height) in m for complete machine & accessories.	Bidder to specify	
28.4	Make of bought items to be furnished to BHEL for approval.	Bidder to confirm	
28.5	Painting of Machine / Electrical Panels: SYNTHETIC ENAMEL GLOSSY FINISH APPLE GREEN PAINT as per IS 5/1994. Shade (ISC) No.: 281	Bidder to specify	
28.6	Total Weight of the machine in kg	Bidder to specify	
28.7	Weight of the Heaviest assembly / sub assembly of the Machine.	Bidder to specify	
28.8	Dimensions of largest sub assembly / assembly of the machine.	Bidder to specify	