



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 76 53
Fax : +91 431 252 07 19
Email : skaruna@bheltry.co.in
Web : www.bhel.com

TWO PART BID

Enquiry
Number:
2731100005

Enquiry
Date:
22.03.2011

Due date for submission
of quotation:
22.04.2011

Tender to be submitted in two parts.

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	Universal Milling Machine as per the technical specification, general guidelines instructions & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	01 No.	30.11.2011


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 that may be hosted in the BHEL Web-site as well as Government Tenders-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


Manager / MM / Capital Equipment

**SPECIFICATION CUM COMPLIANCE CERTIFICATION FOR CONVENTIONAL
UNIVERSAL MILLING MACHINE
QUANTITY : 1 No**

	NOTE:-				
	1. Vendor (OEM) must submit complete information against clause no. 18.0 The offer meeting this clause would only be processed.				
	2. The "Offered" Column and where applicable, the "Deviations" & "Remarks" Column of this 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.				
	3. The offer and all documents enclosed with offer should be in English language only.				
ADDRESS OF THE SUPPLIER :					
TELEPHONE NOS.:					
FAX NOS.:					
E-MAIL ADDRESS :					
SCOPE: SUPPLY, ERECTION & COMMISSIONING OF UNIVERSAL MILLING MACHINE COMPLYING WITH SPECIFICATION AS BELOW					
Sl. No.	Description of BHEL Requirement	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
1.0	MAIN PARAMETERS				
	PURPOSE	For Milling of Carbon Steel, Alloy Steel, Stainless Steel, Titanium and Inconel components.			
2.0	TECHNICAL PARAMETERS				
2.1	Table :				
2.1.1	Overall Size	Vendor to specify			
2.1.2	Clamping area	approx. 1350mm long x 310mm wide			
2.1.3	T-slots : No x Size x Centre Distance	Vendor to specify			

Sl. No.	Description of BHEL Requirement	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
2.1.4	Table weight carrying capacity	around 350 kg			
2.1.5	Longitudinal traverse - power operated	800 mm			
2.1.6	Vertical traverse - power operated	400 mm			
2.1.7	Cross - power operated	230 mm			
2.2	Feeds :				
2.2.1	Number of Feeds	Vendor to specify			
2.2.2	Feed Range: Longitudinal / Cross	16-800 mm / min			
2.2.3	Feed Range: Vertical	4-200 mm / min			
2.2.4	Rapid Rate : Longitudinal / Cross	2500 mm / min			
2.2.5	Rapid Rate : Vertical	600 mm /min			
2.3	Milling spindle :				
2.3.1	Spindle Nose Taper	ISO-40			
2.3.2	Number of Speeds	Vendor to specify			
2.3.3	Speed Range	45-1800 rpm			
2.3.4	Diameter of Front Bearing	Vendor to specify			
2.3.5	Swivel of table to either side	45 deg			
2.3.6	Minimum/Maximum distance from centre of milling spindle to table top surface.	Vendor to specify			
2.3.7	Distance from spindle centre to lower face of over arm	Vendor to specify			

Sl. No.	Description of BHEL Requirement	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
2.4	Drive Motors :				
2.4.1	Spindle motor				
2.4.1.1	Make	SIEMENS/ABB or any other make acceptable to BHEL			
2.4.1.2	Power / RPM	5.5 KW (min.) Vendor to indicate motor RPM			
2.4.2	Feed Motor				
2.4.2.1	Make	SIEMENS/ABB or any other make acceptable to BHEL			
2.4.2.2	Power / RPM	1.5 KW (min.) Vendor to indicate motor RPM			
2.5	Gear System, Clutches & Lubrication	Vendor to give complete details regarding arrangement of feed and speed gear system, their range, number of Electrical clutches, etc and Lubrication system.			
2.6	Tool Clamping	Vendor to furnish details			
2.7	Machine light	Vendor to provide			
2.8	Constructional Details	Vendor to furnish details			
3.0	COOLANT SYSTEM:-				
3.1	Type	Flood coolant			
3.2	Tank capacity, discharge rate, type of filtration, power of motor, splash guard & piping.	Vendor to furnish all details			

Sl. No.	Description of BHEL Requirement	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
4.0	ACCESSORIES 1. Machine vice - width of jaws 150mm – 2 Nos. 2. Milling arbors : a. ISO 40 / MT 2 - 2 Nos. b. ISO 40 / MT 3 - 2 Nos. c. ISO 40 / Dia 22 face mill Stub arbor - 2 Nos. d. ISO 40 / Dia 27 face mill Stub arbor - 2 Nos,	vendor to confirm			
5.0	ELECTRICAL :				
5.01	415V (fluctuation + 10% / -15%), 50HZ (fluctuation +/-3 Hz), 3 Phase AC (3 wire system with out neutral) Power Supply will be provided by BHEL at a single point near the machine, as per 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 vendor. Requirement of grounding / earthing with required material details should be informed by vendor well in advance so that same could be incorporated during construction of foundation.	vendor to confirm			
5.02	All electrical equipment shall be Tropicalized and shall have IP 54 degree of protection	vendor to confirm			
5.03	All electrical control cabinets & panels should be dust and vermin proof	vendor to confirm			

Sl. No.	Description of BHEL Requirement	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
5.04	All electrical components in the cabinets should be mounted on DIN Rail	vendor to confirm			
5.05	Motors shall conform to IEC or Indian Standards. Specify make & rating.	vendor to confirm			
5.06	All electrics shall be of reputed make like Siemens, L&T, BCH, Tele-mechanique.	vendor to confirm			
5.07	Electrical drives shall be of Siemens / ABB / L&T / Eurotherm and PLC of SEW / Allen Bradley / Siemens / Messung / Fanuc	vendor to confirm			
5.08	All components / devices / terminals are to be incorporated with ferrules.	vendor to confirm & specify			
5.09	Vendor should ensure the proper earthing for the machine and its accessories.	vendor to confirm			
5.10	Wiring: All electrical motors, limit switches etc, on the machine shall be wired using PVC sheathed cable running in conduits to common terminal block	vendor to confirm			
5.11	External wiring from / to control panel, control desk, external motors etc shall be by means of unarmoured multi-core / multi strand copper cables.	vendor to confirm			
5.12	All cables/ hoses moving with traversing axes should be installed in cable drag chain. Additionally, all the cable trays required for laying of cables should be included in the offer.	vendor to specify			

Sl. No.	Description of BHEL Requirement	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
5.13	BHEL prefer to have standard gear boxes used in the machine. Gear boxes shall be of Radicon / greaves / Bonfiglioli or any other reputed make acceptable to BHEL.	vendor to confirm			
5.14	All pneumatics shall be of Festo make and hydraulics if any shall be of Rexroth / Vickers make.	vendor to confirm			
6.0	ENVIRONMENTAL PERFORMANCE OF THE MACHINE :				
6.1	Maximum noise level shall not exceed 85 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. Vendor to demonstrate compliance to noise level, if so required.	vendor to confirm			
6.2	The machine shall be suitable for an ambient temperature of + 50° C and relative humidity of 85 % respectively, but both do not occur simultaneously.	vendor to confirm			
6.3	If any safety / environmental protection enclosure is required it shall be built in the machine by the vendor.	vendor to confirm			
6.4	There shall not be any emissions from the machine except fumes of cutting fluid during machining.	vendor to confirm			

Sl. No.	Description of BHEL Requirement	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
7.0	SAFETY ARRANGEMENTS:				
7.1	Machine shall have adequate and reliable safety interlocks / devices to avoid damage to the machine, work piece and the operator due to mistakes or the malfunctioning.	vendor to confirm			
7.2	A detailed list of all alarms / indications provided on machine should be submitted by the Vendor.	vendor to specify			
7.3	Emergency Switches at suitable locations as per International Norms should be provided.	vendor to confirm			
7.4	Enclosures or protective covers shall be provided for the moving parts (either linear or rotary), as a safety measure, as per industry standards.	vendor to confirm			
7.5	All the rotating parts used on machine should be statically & dynamically balanced to avoid undue vibrations, Noise and suitably guarded.	vendor to confirm			
8.0	MACHINE SPARES				
8.1	Itemised break-up of mechanical, hydraulic, electrical and electronic spares used on the machine in sufficient quantity for 2 years of trouble free operation on three shifts continuous running basis should be offered by vendor.	vendor to recommend and confirm			

Sl. No.	Description of BHEL Requirement	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
8.2	Mechanical & Hydraulic Spares: Bearings, Clutches, gears and all types of Pumps, Valves, Pressure Switches / Transducers, Filters, Seals, 'O' Rings, Hydraulic Hoses, etc.	vendor to specify			
8.3	Electrical: All types of Relays, Contactors, Proximity Switches, Printed Circuit Boards, Push Buttons, Indicating Lamps, Semiconductor Fuses, Special Fuses, Circuit Breakers, Main Power Switch, etc.	vendor to specify			
8.4	All types of spares for total machine and accessories shall be available for at least ten years after supply of the machine. If 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 & Vendors to enable BHEL to procure these in advance, if required.	vendor to specify			
8.5	Vendor to confirm that complete list of spares for machine and accessories, along with specification / type / model, and name & address of the spare Vendor shall be furnished along with documentation to be supplied with the machine.	vendor to confirm			
9.0	DOCUMENTATION :				
9.1	Set of Documents to be submitted along with the Offer for technical evaluation:	vendor to confirm			

Sl. No.	Description of BHEL Requirement	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
9.1.1	General Lay-out of the machine with major and critical dimensions in line with the specification				
9.1.2	General Assembly drawing of the machine with bill of materials and critical dimensions.				
9.1.3	Sub-assembly / Arrangement drawings with bill of materials and critical dimensions.				
9.1.4	List of bought out items with make and specification along with catalogues: Drives, Motors, Gear boxes, etc.				
9.1.5	Hydraulic / Pneumatic Circuit with Bill of Materials (if proposed in the system)				
9.1.6	Electrical Circuit with Bill of Materials.				
9.1.7	Video images on CD /Hard copy of literature with photographs & drawings explaining the technical features.				
9.2	Set of Documents to be submitted after placement of order for approval / verification before manufacturing:	vendor to confirm			
9.2.1	General Lay-out of the machine with major and critical dimensions in line with the specification and Preliminary Foundation drawing.				
9.2.2	General Assembly drawing of the machine with bill of materials and critical dimensions.				

Sl. No.	Description of BHEL Requirement	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
9.2.3	Sub-assembly / Arrangement drawings with bill of materials and critical dimensions.				
9.2.4	Hydraulic / Pneumatic Circuit with Bill of Materials (if available in the system)				
9.2.5	Electrical Circuit with Bill of Materials.				
9.2.6	Quality Plan				
9.3	Set of Documents to be submitted along with machine:	vendor to confirm			
9.3.1	Three sets of following documents as Hard copies and 1 set of all documents including bought out item catalogues – soft copy in CD in English Language should be supplied along with the machine.				
9.3.2	One set of complete documents as Hard copy and complete documents in CD / Pen drive to be submitted during inspection at supplier's works for verification.				
9.3.3	Operating Manuals of equipments				
9.3.4	Detailed Maintenance manual of machine with all drawings of machine assemblies/sub-assemblies/parts including Electrical /PCB circuit diagrams/ Pneumatic/ Hydraulic Circuit Diagrams. All Assembly/ Sub Assembly Drawings shall be supplied with the part list / Bill of Materials giving complete specification and make of components.				

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9.3.5	Maintenance, Interface & Commissioning Manuals for speed drives.				
9.3.6	Manufacturing drawings for all wearing components like bushes, pulleys, gears, etc.				
9.3.7	Catalogues, O&M Manuals of all bought out items including drawings, wherever applicable highlighting the specific model used in the supplied machine.				
9.3.8	Detailed specification of all rubber items, hoses, fittings, etc. List of bearings, belts used to be provided.				
9.3.9	Operating Manuals, Maintenance Manuals & Catalogues for all supplied Accessories.				
9.3.10	Complete Master List of parts used in the equipment.				
9.3.11	Complete list of spares for equipments and accessories, along with item part no / specification / type / model, and name & address of the spare supplier shall be furnished.				
10.0	Compressed air supply				
10.1	BHEL supplied compressed air will be at a pressure of 60 PSI to 70 PSI only . All pneumatic systems on the machine shall be designed to operate efficiently at this air pressure. A suitable refrigerant type air drier shall be included in the system by the vendor.	vendor to confirm			

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11.0	TRAINING OF BHEL PERSONNEL	vendor to specify			
11.1	Air-fare, boarding & lodging for the trainees shall be borne by BHEL.				
11.2	Competent, English speaking experts shall be arranged by the vendor during training for satisfactory & effective training of BHEL personnel.				
11.3	BHEL Personnel shall be trained at Supplier's Works for mutually agreed period (3 Days) in the area of a. Mechanical, Electrical & Electronic Maintenance for Machine & other Accessories supplied c. Operation of the Machine & other Accessories supplied				
11.4	After commissioning the machine at BHEL, training to be provided to the operators and maintenance staff for a period of 5 days.				
11.5	Bidder to quote for training on man-day / week basis				
12.0	ACCURACY TESTS:				
12.1	Geometrical Accuracy Tests shall be in accordance with ISO standard or equivalent applicable standard. Detailed Test Charts for the same, clearly showing the accuracies to be achieved on the machine, shall also be submitted with the offer.	vendor to specify			

Sl. No.	Description of BHEL Requirement	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
12.2	Test mandrel for checking spindle run-out & alignment..etc, should be supplied along with the machine.	vendor to specify			
13.0	INSPECTION & MACHINE ACCEPTANCE				
13.1.0	<u>MACHINE ACCEPTANCE:</u> (Tests/Activities to be performed by Vendor at Vendor's works, on the machine, before despatch :)	vendor to confirm			
13.1.1	Physical Inspection and Verification of Certificates or Records for Materials of Construction, Bought-out Items, Adherence to Machine Building Procedures given by the Vendor, etc.				
13.1.2	Idle running of mechanical, electrical components / parts of machine for 48 hrs. continuously and accuracy tests				
13.1.3	Demonstration of all features of the machine, control system & accessories				
13.1.4	Machining of test piece. Vendor to supply test piece and tooling for it's machining.				
13.2.0	Tests / Activities to be carried out at BHEL works while commissioning the machine:	vendor to confirm			
13.2.1	Demonstration of all features of the machine, control system & accessories to the satisfaction of BHEL for efficient and effective use of the machine				
13.2.2	Demonstration by actual use of all supplied attachments and accessories to their full capacity.				

Sl. No.	Description of BHEL Requirement	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
13.2.3	Idle running of mechanical, electrical components / parts of machine for 48 hrs. continuously and accuracy tests				
13.2.4	Training to BHEL operators & maint. Staff for 5 days after commissioning.				
13.2.5	Machining of test piece. Vendor to supply test piece and tooling for it's machining.				
14.0	MACHINE ERECTION & COMMISSIONING	vendor to confirm			
14.1	Foundation: Vendor to submit the layout and foundation drawing for getting BHEL's approval within one month from the date of Letter of Intent (LOI) / P.O. whichever is earlier. The layout should consist of all requirements pertaining to complete machine including space. BHEL shall construct complete foundation as per the drawing supplied by vendor.				
14.2	Vendor to take full responsibility for supervision of the erection, vendor shall start up, test the machine, it's control & all types of other supplied equipment, carrying out welding of test pieces etc. Service requirement like power & air shall be provided by BHEL at only one point to be indicated by Vendor in their foundation/layout drawings. Other requirements like crane and helping personnel shall also be provided by BHEL.				

Sl. No.	Description of BHEL Requirement	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
14.3	All tests, as mentioned in Clause No.13.2.0 shall form part of the commissioning activity.				
14.4	Tools, Tackles, Testing Instruments and other necessary equipment required to carry out all above activities shall be brought by the Vendor.				
14.5	Commissioning spares, required for commissioning of the machine within stipulated time, shall be brought by the Vendor on returnable basis.				
14.6	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 colours of paint used.				
14.7	Schedule of Erection and Commissioning shall be submitted with the offer.				
14.8	Charges, duration, terms & conditions for Erection & Commissioning should be furnished in detail separately by Vendor along with the Technical Offer.				
14.9	<u>LEVELLING & ANCHORING SYSTEM</u> : Vendor to supply the required foundation details for mounting the machined rails on the floor. Machined rails with anchoring and leveling materials shall form part of the scope of supply, by the vendor.				

Sl. No.	Description of BHEL Requirement	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
15.0	MACHINE PACKING : Sea worthy & rigid packing for all items of complete machine, control panels , all accessories and other supplied items to avoid any damage/loss in transit. When machine is dispatched in containers, all small loose items shall be suitably packed in boxes	vendor to confirm			
16.0	<u>GUARANTEE:</u> The equipment has to be guaranteed for its performance and also of the sub-assemblies / bought-out items, for a minimum period of 12 months from the date of commissioning at BHEL Works. OR 18 months from dispatch.	vendor to confirm			
17.0	GENERAL :				
17.1	Machine Model No.	vendor to furnish			
17.2	Total connected load (KVA):	vendor to furnish			
17.3	Floor area required (Length, Width, Height) for complete machine & accessories Total connected load in KW	vendor to furnish			
17.4	Painting of Machine / Electrical Panels : SYNTHETIC ENAMEL GLOSSY FINISH APPLE GREEN PAINT AS PER IS 5/1994. Shade : (ISC)NO-281.	vendor to furnish			
17.5	Total weight of the machine	vendor to furnish			

Sl. No.	Description of BHEL Requirement	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
17.6	Vendor to submit ,reference list of customers where similar machines have been supplied mentioning broad specifications of the supplied machine i.e. Model, Load Carrying Capacity,Traverses, Main Drive Rating, etc	vendor to furnish			
17.7	GA Drg. with layout and stroke dimensions, catalogues , sketch/ photographs of the m/c and accessories/ attachments should be submitted with the offer.	vendor to furnish			
18.0	REFERENCE LIST / QUALIFYING CONDITIONS :				
18.1	Only those vendors(OEMs), who have supplied and commissioned at least one Universal Milling Machine of same (Table traverses, Load carrying capacity) or higher sizes in the past five years and such machine is presently working satisfactorily for more than one year after commissioning, should quote. The following information should be submitted by the vendor about the companies where referred machines have been supplied. This is required from all the vendors for qualification of their offer.	Vendor to comply			
18.1.1	1. Name of the customer / company where similar machine is installed.	vendor to furnish			

Sl. No.	Description of BHEL Requirement	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
18.1.2	2. Complete postal address of the customer.	vendor to furnish			
18.1.3	3. Year of commissioning.	vendor to furnish			
18.1.4	4. Name and designation of the contact person of the customer.	vendor to furnish			
18.1.5	5. Phone, FAX no. and email address of the contact person of the customer.	vendor to furnish			
18.1.6	P.O copy / Commissioning report of the referred machine	vendor to furnish			
18.2	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			