



An ISO 9001  
Company

## Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

MATERIALS MANAGEMENT / CAPITAL EQUIPMENT

### ENQUIRY NOTICE INVITING TENDER

Phone: +91 431 257 7653  
Fax : +91 431 252 0719  
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:

2621100157

Enquiry  
Date:

13.10.2011

Due date for submission of  
quotation :

14.11.2011

You are requested to quote the Enquiry number date and due date in all your correspondences. 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 No.	Item Description	Quantity (Nos.)	Consignee address
10	Radial Drilling Machine 80 mm as per the technical Specification, scope & 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> )	01	BHEL Trichy
20		04	Power Plant Piping Unit Thirumayam

#### Important Points to be taken care during the submission of offer:-

1. Check list to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.
2. The First item (Sl.No.10) consisting of 01 No. of Radial Drilling Machine 80 mm dia is to delivered at BHEL, Trichy and The Second Item (Sl.No.20) consisting of 04 Nos. of Radial Drilling Machine 80 mm dia is to be delivered at Thirumayam Unit.
3. The delivery period required is 6 Months.

BHEL's General guidelines /instructions including bank guarantee formats and list of consortium banks, commercial terms checklist 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) Tender Enquiry reference "2621100157"

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  
Manager

MM / Capital Equipment  
BHEL, TRICHY-620 014

**PART A**  
**RADIAL DRILLING MACHINE**  
**SECTION – I: QUALIFYING CRITERIA**

The BIDDER has to compulsorily meet the following requirements to get qualified for considering the technical offer:

S. No.	REQUIREMENTS	Vendor's Response
1	<p>Only those vendors (<b>OEMs</b>), who have supplied and commissioned at least one <b>RADIAL DRILLING MACHINE</b> with</p> <p><b>1. Spindle power of 10 KW or more,</b></p> <p><b>2. Drilling capacity of minimum 75 mm on steel and</b></p> <p><b>3. Drilling radius of 2000 mm or more from column center</b> in the past ten years are only eligible to quote.</p> <p>Such supplied machine should currently be working satisfactorily for a minimum period of one year counted reverse from the date of opening of this Tender.</p> <p><i>(However, if such machine is already supplied to BHEL, then that machine should currently be working satisfactorily for a minimum period of six months counted reverse from the date of opening of this Tender.)</i></p> <p>One Performance Certificate for such a machine should be submitted to qualify for this tender. The performance certificate must contain the details indicated in section-IV at the end of this specification (Part-A)</p>	
	<b>Vendor should specify below where similar machine has been supplied.</b>	
1.1	Name and postal address of the customer or company where similar machine is supplied.	
1.2	Name and designation of the contact person of the customer.	
1.3	Phone, FAX no and email address of the contact person of the customer.	
1.4	Month and Year of commissioning of the machine.	
1.5	Parameters of machine supplied, viz. Spindle power, Drilling capacity and the application for which the machine is supplied.	
1.6	BHEL reserves the right to verify the information provided by vendor. In case the information provided by vendor is found to be false/ incorrect, the offer shall be rejected.	
1.7	<b>DELIVERY</b> - The bidder shall quote the best possible delivery. However the delivery shall not exceed 6 months with an additional grace period of 2 months. The additional grace period will attract a penalty which is explained in the commercial terms of the enquiry. The delivery period shall be reckoned from date of purchase order to dispatch from the vendor works.	

## **SECTION – I I**

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

<b>S. No.</b>	<b>REQUIREMENTS</b>	<b>Vendor's Response</b>
3.0	The BIDDER/VENDOR to furnish Reference List of Customers, with full address, details of contact person, where RADIAL DRILLING MACHINES have been supplied in the past.	
4.0	Details of RADIAL DRILLING MACHINES supplied to other BHEL units, if any. (Year of commissioning, Spindle power and Drilling capacity).	
5.0	Details on SERVICE-AFTER-SALES Set-Up in India including the Address of Agents / Service Centers in South India.	
6.0	Any Additional Data to supplement the manufacturing capability of the BIDDER for the subject equipment.	

## **SECTION – III**

The BIDDER to note:

<b>S. No.</b>	<b>PARTICULARS</b>	<b>Vendor's Response</b>
7.0	The BIDDER / VENDOR shall submit the offer in TWO PARTS. 1. Technical Offer [with PART A & PART B] and Commercial offer. 2. Price Bid.	
8.0	The Technical Offer shall contain a comparative statement of Technical <b>Specifications demanded by BHEL</b> and <b>Offer Details submitted by the Bidder</b> , against each clause. A just 'CONFIRMED' or 'COMPLIED' or 'YES' or 'NO-DEVIATION' or similar words in the technical comparative statement may lead to disqualification of the Technical Offer.	
9.0	The Technical Offer shall be supported by product Catalogues & Data Sheets and also technical details of Bought-Out-Items with copies of Product Catalogue to the extent possible.	
10.0	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.	

## SECTION – IV

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

### PERFORMANCE CERTIFICATE

1. Supplier of the machine			
2. Make & Model of the M/C			
3. Month & Year of Commissioning			
4. Application for which M/C is used			
5	a) Spindle Motor Power (cont. rating) b) Drilling Capacity on steel c) Max Drilling radius in mm d) Spindle Taper (Morse No) e) Spindle speed range(RPM) f) Spindle feed range (mm/rev)		
6. Performance of the Equipment (Tick whichever is <b>applicable</b> )		Satisfactory	
		Good	
		Average	
		Not Satisfactory	
7. Service after sales (Tick whichever is <b>applicable</b> )		Satisfactory	
		Good	
		Average	
		Not Satisfactory	
<div style="display: flex; justify-content: space-between;"> <div>Date:</div> <div>Signature &amp; Seal of the Authority Issuing the Performance Certificate</div> </div>			

PART- B**TECHNICAL SPECIFICATION FOR RADIAL DRILLING MACHINE – Dia. 80mm**

Clause No	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER With Technical Details																																
1.0	<b>PURPOSE:</b> This machine is intended for Drilling, Counter Boring, Tapping, and Spot facing (Internal & External) on large diameter power and utility Boiler Pipes and Piping components. The work piece material will be <b>Steel Pipes / Castings / Forgings</b> .																																	
1.1	<b>WORK-PIECE MATERIAL DATA:</b>																																	
1.2	Max. work piece size in mm: <b>3500</b> Length <b>x1400</b> Width <b>x 900</b> Height																																	
1.3	Work piece Weight : <b>2000 Kgs</b> .																																	
1.4	<table><tr><th>Work piece type</th><th>Material</th><th>ASTM Specification</th><th>Hardness</th></tr><tr><td rowspan="2">Steel Pipes</td><td>Carbon Steel</td><td>SA 106 Gr A,B,C</td><td>185 BHN</td></tr><tr><td>Alloy Steel</td><td>SA 335 P91,11,12,22,92</td><td>225 BHN</td></tr><tr><td rowspan="4">Steel Castings</td><td rowspan="2">Carbon Steel</td><td>A216 WCB, WCC</td><td>185 BHN</td></tr><tr><td>A352 LCB, LCC</td><td>225 BHN</td></tr><tr><td>Alloy Steel</td><td>A 217 WC5, WC6, WC9, C12A</td><td>210 BHN</td></tr><tr><td>Stainless Steel</td><td>A351 CF3M, CF8, CF8C and CF8M</td><td>230 BHN</td></tr><tr><td rowspan="3">Steel Forgings</td><td>Carbon Steel</td><td>SA105</td><td>185 BHN</td></tr><tr><td rowspan="2">Alloy Steel</td><td>SA 182 F22 Class 3</td><td>210 BHN</td></tr><tr><td>SA 182 F91</td><td>225 BHN</td></tr></table>	Work piece type	Material	ASTM Specification	Hardness	Steel Pipes	Carbon Steel	SA 106 Gr A,B,C	185 BHN	Alloy Steel	SA 335 P91,11,12,22,92	225 BHN	Steel Castings	Carbon Steel	A216 WCB, WCC	185 BHN	A352 LCB, LCC	225 BHN	Alloy Steel	A 217 WC5, WC6, WC9, C12A	210 BHN	Stainless Steel	A351 CF3M, CF8, CF8C and CF8M	230 BHN	Steel Forgings	Carbon Steel	SA105	185 BHN	Alloy Steel	SA 182 F22 Class 3	210 BHN	SA 182 F91	225 BHN	
Work piece type	Material	ASTM Specification	Hardness																															
Steel Pipes	Carbon Steel	SA 106 Gr A,B,C	185 BHN																															
	Alloy Steel	SA 335 P91,11,12,22,92	225 BHN																															
Steel Castings	Carbon Steel	A216 WCB, WCC	185 BHN																															
		A352 LCB, LCC	225 BHN																															
	Alloy Steel	A 217 WC5, WC6, WC9, C12A	210 BHN																															
	Stainless Steel	A351 CF3M, CF8, CF8C and CF8M	230 BHN																															
Steel Forgings	Carbon Steel	SA105	185 BHN																															
	Alloy Steel	SA 182 F22 Class 3	210 BHN																															
		SA 182 F91	225 BHN																															

Clause No	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
<b>2.0.0</b>	<b>MACHINE CONFIGURATION:</b>		
	The machine shall have a thick base plate and vertical column to which is mounted a horizontal radial arm. The horizontal arm shall move up and down the column and can be rotated / locked at any position. The drilling head shall move along the radial arm towards or away from the column and can be locked at any position. The spindle shall be housed in the drilling head and shall rotate and also move up / down. The drilling head shall have counter balance arrangement.	Vendor to confirm	
<b>2.1</b>	<b>CAPACITY</b>		
2.1.1	Drilling capacity in steel <b>(Min 80 mm)</b>	Vendor to specify	
2.1.2	Drilling capacity in cast iron <b>(Min 100 mm)</b>	Vendor to specify	
2.1.3	Tapping capacity in steel <b>(65mm)</b>	Vendor to specify	
2.1.4	Tapping capacity in cast iron <b>(75mm)</b>	Vendor to specify	
<b>2.2</b>	<b>SPINDLE</b>		
2.2.1	Spindle Taper	MT 6	
2.2.2	Quill diameter <b>(Not less than 100 mm)</b>	Vendor to specify	
2.2.3	Spindle motor power <b>(Min required=10 KW)</b>	Vendor to specify	
2.2.4	Spindle travel or stroke: <b>(Min required=450 mm)</b>	Vendor to specify	
2.2.5	Braking System to slow down and stop the spindle	Vendor to describe	
<b>2.3</b>	<b>SPINDLE SPEED AND FEED</b>		
2.3.1	Spindle speed range: <b>11 to 1250 rpm</b>	Vendor to specify	
2.3.2	Number of steps for Spindle speed : <b>Min 16 steps</b>	Vendor to confirm	
2.3.3	Spindle feed range Min / Max : <b>0.04 to - 2.8 mm/rev</b>	Vendor to specify	

Clause No	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
2.3.4	No of feed steps: <b>Min 16 steps</b>	Vendor to confirm	
2.3.5	Mode of pre selection of feed and speed	Vendor to specify	
2.3.6	Auto depth control mechanism for spindle travel	Vendor to confirm	
2.3.7	Powered Feeding	Vendor to confirm	
<b>2.4</b>	<b>ARM</b>		
2.4.1	Column face to spindle center - Max	2500 mm	
2.4.2	Column face to spindle center - Min	500 mm	
2.4.3	Spindle head travel on radial arm	2000 mm	
2.4.4	Base plate surface to spindle end - Max	2000 mm	
2.4.5	Base plate surface to spindle end - Min	550 mm	
2.4.6	Spindle travel or stroke: <b>(Min required=450 mm)</b>	Vendor to specify	
2.4.7	Vertical travel of radial arm : <b>(Min required=1000 mm )</b>	Vendor to specify	
2.4.8	Arm rotation ( Right & Left)	180 °	
2.4.9	Centralized Clamping / unclamping for the arm with push button	Vendor to specify	
2.4.10	Power of Arm Locking motor, if any	Vendor to specify	
2.4.11	Power locking of sleeve on column	Vendor to specify	
2.4.12	Powered Drill head traverse on Arm	Vendor to confirm	
2.4.13	Arm Elevating motor power: <b>(Min required=3 KW )</b>	Vendor to specify	
<b>2.5</b>	<b>COLUMN</b>		
2.5.1	Column sleeve dia <b>(Not less than 500 mm)</b>	Vendor to specify	
<b>2.6</b>	<b>MACHINE GUIDE WAYS</b>		
2.6.1	Width of Arm guide ways	Vendor to specify	
2.6.2	Hardness of guide ways	Vendor to specify	

Clause No	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
<b>2.7</b>	<b>BASE PLATE</b>		
2.7.1	Base plate area ( <b>Min 3500x1400 mm</b> )	Vendor to specify	
2.7.2	Base plate thickness ( <b>min. 300 mm</b> )	Vendor to specify	
2.7.3	Base plate working surface	Vendor to specify	
2.7.4	Size of T-slots: <b>M24</b>	Vendor to confirm	
2.7.5	T-slot pitch ( <b>as per DIN standard</b> )	Vendor to specify	
<b>2.8</b>	<b>COOLANT FACILITY</b> 1. Flood coolant with suitable pump, motor & filtration system shall be offered. 2. Proper collection and recirculation shall be ensured. 3. Coolant on/off facility through push buttons on control panel	Vendor to confirm	
2.8.1	Coolant flow: <b>Minimum 30 Litres / min</b>	Vendor to confirm	
2.8.2	Coolant motor power : <b>min 0.18 Kw</b>	Vendor to confirm	
<b>2.9</b>	<b>LUBRICATION SYSTEM</b> Centralized auto lubrication shall be offered with metering cartridges and necessary electrical interlock.	Vendor to Confirm	
<b>2.10</b>	<b>CONSTRUCTION</b> Vendor has to furnish constructional details of the machine including explanatory drawings / Catalogues of various components/ assemblies like Column, Base plate, Arm, Drilling unit, Spindle etc.	Vendor to furnish	
<b>2.11</b>	<b>OPERATION CONTROL</b> Machine's operation control shall be provided on the drill head itself. No separate switch box is needed. Joy Stick / push button arrangement shall be provided for head & arm	Vendor to confirm	



	movement. All switches should be within reach of operator for convenient, efficient & safe operation. All indications should also be conveniently placed.		
<b>Clause No</b>	<b>PARTICULARS AND BHEL SPECIFICATION</b>	<b>BIDDER'S OFFER With Technical Details</b>	
<b>3.0</b>	<b>MACHINE LIGHTS:</b>		
3.1	Machine Light of 24V to be provided in the Headstock for sufficient illumination of working area.	Vendor to confirm	
3.2	All light fittings, consumables, adapters / receptacles should have compatibility with Indian equivalents	Vendor to confirm	
<b>4.0</b>	<b>HYDRAULIC SYSTEM</b> If the machine has hydraulics, then the details of the system should be furnished	Vendor to provide	
<b>5.0</b>	<b>ELECTRICAL SYSTEM:</b>		
5.1	AC Power Supply of 415V $\pm 10\%$ , 50HZ $\pm 1.5$ HZ, (3 Phase 3 wire system) 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.	Vendor to confirm	
5.2	Tropicalization: All electrical equipment shall be tropicalized	Vendor to confirm	
5.3	All electrical controls & systems should be dust and vermin proof	Vendor to confirm	
5.4	All electrical components in the cabinets should be mounted on DIN Rail	Vendor to confirm	
5.5	All electrical panels should be provided with fluorescent lamps for sufficient illumination and power receptacles of 220Volts, 5/15 Amp AC. All adapters/receptacles should have compatibility with Indian equivalents.	Vendor to confirm	

Clause No	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
5.6	Vendor should ensure the proper earthing for the machine and its accessories.	Vendor to confirm	
5.7	All motors shall be from M/s <b>Siemens/KEC/ ABB</b> or any other makes acceptable to BHEL and confirming to IEC standard.	Vendor to confirm	
5.8	All electrical devices like contactors, relays and limit switches, push buttons etc. shall be from <b>Siemens / L&amp;T/ Alstom / Cuttler Hammer / Telemechanique.</b>	Vendor to confirm	
5.9	All components/devices/terminals are to be incorporated with ferrules. (Numbered)	Vendor to confirm	
6.0	<b>SAFETY ARRANGEMENTS:</b> Following safety features in addition to other standard safety features should be provided on the machine:	Vendor to confirm	
6.1	Machine should have adequate and reliable safety interlocks / devices to avoid damage to the machine, work piece and the operator due to the malfunctioning or mistakes.	Vendor to confirm	
6.2	All the pipes, cables etc. on the machine should be well supported and protected.	Vendor to confirm	
6.3	All the rotating parts used on machine should be statically & dynamically balanced to avoid undue vibrations.	Vendor to confirm	
6.4	Emergency Switches at suitable locations as per International norms are to be provided.	Vendor to confirm	
6.5	Oil & water pipe lines should not run with electrical cable.	Vendor to confirm	
6.6	A detailed list of safety alarms / indications provided on machine should be submitted by the supplier.		
7.0	<b>ENVIRONMENTAL PERFORMANCE OF THE MACHINE: The Machine shall conform to following factors related to environment</b>	Vendor to confirm	

Clause No	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
7.1	Noise level shall not exceed 85 dB (A) at normal load condition, 1 meter away from the machine with correction factor for back ground noise, if necessary.	Vendor to confirm	
7.2	If any safety / environmental protection enclosure is required it should be built in the machine by the vendor.	Vendor to confirm	
7.3	Paint of the machine should be oil / coolant resistant and should not peel off and mix up with coolant.	Vendor to confirm	
<b>8.0</b>	<b>LEVELING &amp; ANCHORING SYSTEM</b>		
8.1	Complete anchoring system including foundation bolts; anchoring materials, fixators, leveling shoes etc shall be supplied by the vendor. BHEL shall construct foundation for the machine. Vendor shall furnish the foundation details in advance.	Vendor to confirm	
<b>9.0</b>	<b>TOOLS FOR OPERATION &amp; MAINTENANCE</b>		
9.1	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	
9.2	Test mandrel if any for checking spindle run-out & alignment should be supplied	Vendor to confirm	
9.3	Utility tools like drifts , cotter pins of all sizes (2 sets)	Vendor to confirm	
9.4	<b>Reduction Sleeves:</b> MT6 to MT5 - 2 Nos. MT6 to MT4 - 2 Nos. MT4 to MT3 - 2 Nos. MT4 to MT2 - 2 Nos.	Vendor to offer	
9.5	Tapping Attachment with collets- M6 to M24 - 2 Sets	Vendor to offer	

Clause No	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
9.6	Tapping Attachment with collets- M24 to M48 - 2 Sets	Vendor to offer	
9.7	Tapping Attachment with collets- M48 to M60 - 2 Sets	Vendor to offer	
<b>10.0</b>	<b>ACCESSORIES</b>		
10.1	Cast iron Box Table - 1 No 1000mm (L) x 750mm (B) x 500mm (H) with T-Slots for M 24	Vendor to offer	
10.2	Tilting Table - 1 No 725mm (L) x 500mm (B) x 600mm (H) with T-Slots for M24	Vendor to offer	
10.3	Safety interlocks for feed mechanism to prevent overloading.	Vendor to specify	
<b>11.0</b>	<b>SPARES:</b>		
11.1	The Vendor shall recommend and submit list of spares required for the machine for two years of trouble free operation on three shifts /day basis under two headings as <b>a) Mechanical spares:</b> <b>b) Electrical / Electronic spares:</b> <b>c) Un-priced list</b> of spares (mentioned in a&b above) with quantities should be submitted with the technical offer. <b>d) Priced list</b> of the spares (mentioned in a&b above) shall be submitted in a sealed cover with the commercial bid.	Vendor to furnish	
11.3	All types of spares should be available for at least ten years after supply of the machine. In case the machine is likely to become obsolete within ten years period, the vendor should inform BHEL to procure the spares in advance.	Vendor to confirm	

Clause No	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
11.4	Vendor to confirm for provision of complete list of spares for the machine and accessories with specification / type / model, and name & address of the spare supplier along with documentation incase of ordering	Vendor to confirm	
<b>12.0</b>	<b>DOCUMENTATION:</b>		
12.1	Three sets of following documents (Hard copies) in English language should be supplied along with the machine	Vendor to confirm	
12.2	Detailed Operation and Maintenance manual of machine with all drawings of machine assemblies/sub-assemblies/parts including Electrical / Coolant circuit diagrams.	Vendor to confirm	
12.3	Catalogues, O&M Manuals and drawings of all bought out items, bearings etc.	Vendor to confirm	
12.4	Electronic and electrical interconnecting drawings (i.e. Between machine, control panel and drives). <b>Hard copy: 3 Nos</b>	Vendor to confirm	
12.5	Electrical circuits and Hydraulic circuits, if any with BOM	Vendor to confirm	
12.6	Detailed specification of all rubber items and hydraulic / lubrication fittings	Vendor to confirm	
12.7	The vendor shall submit complete Master List of parts used in the machine.	Vendor to confirm	
12.8	One additional set of all the above documentation on CD ROM.	Vendor to confirm	

Clause No	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
<b>13.0</b>	<b>ERECTION &amp; COMMISSIONING</b>		
13.1	<ol style="list-style-type: none"> <li>1. Vendor to supervise erection &amp; commissioning including start up, testing of machine, it's control system &amp; all other supplied equipment, machining of test pieces etc.</li> <li>2. The vendor shall bring special tools and equipment required for erection of the machine</li> <li>3. Service requirement like power, air &amp; water shall be provided by BHEL at only one point to be indicated by Vendor in their foundation/layout drawings.</li> <li>4. Material handling facility will be provided by BHEL free of cost.</li> </ol>	Vendor to confirm	
13.2	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.	Vendor to confirm	
13.3	Duration, terms & conditions for E&C should be furnished with this technical offer in detail.	Vendor to specify	
<b>14.0</b>	<b>ACCURACY TESTS</b>		
<b>14.1</b>	<b>GEOMETRICAL ACCURACIES</b>		
14.2	Geometrical Accuracy Tests shall be in accordance with IS: 2199, ISO 2423 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 confirm	

Clause No	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
14.3	All the above accuracies to be demonstrated to BHEL engineers during pre-acceptance tests at Suppliers works and during Commissioning at BHEL Works.	Vendor to confirm	
<b>15.0</b>	<b>AMBIENT CONDITIONS &amp; THERMAL STABILITY</b>		
15.1	Ambient Temperature: max. 50 deg C (in a year) Relative Humidity - 85%	Vendor to note	
15.2	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	
15.3	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	
15.4	The machine, including attachments and accessories, should be suitable for 3 shifts, continuous operation.	Vendor to confirm	
<b>16.0</b>	<b>MACHINE ACCEPTANCE: (Tests/Activities to be Performed by Vendor)</b>	Vendor to confirm	
<b>16.1</b>	<b>Tests/Activities to be carried out at supplier's works on the machine before dispatch:</b>	Vendor to confirm	
16.1.1	Geometrical Accuracy Tests as per test chart provided by the supplier	Vendor to confirm	
16.1.2	<b>Full load test to demonstrate the maximum power, drilling and tapping capacities:</b> The capacity and capability of the machine is to be demonstrated on test pieces and tools (vendor's scope). Successful machining of at least 5 holes and 3 tapping of maximum size will be considered for accepting the machine. The drilling depth shall be min 150mm and tapping depth shall be min 100 mm.	Vendor to confirm	

Clause No	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER With Technical Details
16.2	<b>Test to be carried out at BHEL works while commissioning the machine:</b>	Vendor to confirm
16.2.1	Geometrical Accuracy Tests as per test chart.	Vendor to confirm
16.2.2	<b>Full load test to demonstrate the maximum power, drilling and tapping capacities:</b> The capacity and capability of the machine is to be demonstrated on actual Jobs provided by BHEL with tools supplied by BHEL. Successful machining of at least 10 holes and 5 tapping of maximum size will be considered for accepting the machine. The drilling depth shall be min 150mm and tapping depth shall be min 100 mm.	Vendor to confirm
17.0	<b>TRAINING</b>	
17.1	Training of BHEL machine operators in operation and maintenance of complete machine at BHEL works during commissioning.	Vendor to confirm
18.0	<b>FOUNDATION</b>	
18.1	Vendor shall submit the preliminary General Arrangement Drawing and Layout Drawing of the machine for getting BHEL's approval within 4 weeks from the date of Letter of Intent (LOI) / P.O. Foundation drawing and details like static / dynamic load etc. and final Layout drawings shall be submitted by the supplier within 2 weeks after getting BHEL's approval. BHEL shall construct complete foundation for the machine. The vendor shall also indicate specification of grouting compound.	Vendor to confirm
18.2	Foundation bolts, leveling plates etc. to be supplied with the machine	Vendor to confirm
19.0	<b>PAINTING:</b> Painting of Machine / Electrical Panels: RAL 6011 Apple Green (Polyurethane Paint)	Vendor to confirm



Clause No	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
<b>20.0</b>	<b>PACKING</b>		
20.1	Sea worthy & rigid packing for all items of complete machine, 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	
<b>21.0</b>	<b>GUARANTEE</b>		
21.1	12 months from the date of acceptance of the machine or 18 months from the date of supply whichever is earlier.	Vendor to confirm	
<b>22.0</b>	<b>SPECIAL POINTS:</b>		
22.1	Machine configuration shall be such that drilling head; arm, column and base shall be sturdy enough to withstand all types of reactionary forces developed.	Vendor to specify	
22.2	For drill head movement in the arm, hardened guide-ways with linear motion bearings preferred. screw rod should be covered with suitable bellows.	Vendor to specify	
22.3	Dial collar on headstock having good quality of chromium plating.	Vendor to confirm	
22.4	All locking mechanisms shall be smooth and trouble free to operate.	Vendor to confirm	
22.5	Flexible metal hose for coolant is preferable at headstock.	Vendor to specify	
22.6	Efficient lubrication system is to be introduced to avoid oil leakage from spindle during higher strokes.	Vendor to confirm	
22.7	First fill of lubrication oil & grease is in supplier's scope.	Vendor to confirm	
<b>23.0</b>	<b>GENERAL POINTS</b>		
23.1	Machine Model No	Vendor to specify	
23.2	Total connected load (KVA):	Vendor to specify	

Clause No	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
23.3	Floor area required (Length, Width, Height) for complete machine & accessories	Vendor to specify	
23.4	Total weight of the machine	Vendor to specify	
23.5	The offer shall clearly indicate the list of standard accessories that will be supplied along with the machine	Vendor to list	
23.6	Accessories other than those specified shall be quoted separately as optional items.	Vendor to specify	
23.7	Hard copy of literature / Catalogs with photographs & drawings explaining the technical features shall be enclosed with the offer	Vendor to furnish	
23.8	Coolant tank should not be integral part of the machine. Lubrication pump should be kept outside of head stock	Vendor to confirm	