



Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

An ISO 9001
Company

CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

ENQUIRY	Phone: +91 431 257 76 83 Fax : +91 431 252 07 19 Email : ramado@bheltry.co.in Web : www.bhel.com
----------------	---

	Enquiry Number:	Enquiry Date:	Due date for submission of quotation:
	2720800018	29.10.2008	01.12.2008

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

Item	Description	Quantity	Delivery (Item required at BHEL on)
10	Conventional Horizontal Boring Machine – Dia 110 mm as per the technical specification & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	1 No.	30.09.2009

**Note: Offer should be
Foreign Bidders: CFR Mumbai Port**

Indigenous Vendors:
FOR, BHEL, Stores
Industrial Valves Plant
433, Industrial Complex
Goindwal – 143 423
District: Tarn Taran (Punjab), India

BHEL commercial terms & conditions with Price Bid and Bank Guarantee formats along with technical specifications can be downloaded from BHEL web site <http://www.bhel.com> or from the Government tender website <http://tenders.gov.in> (public sector units > Bharat Heavy Electricals Limited page) under Enquiry reference “2720800018”.

Tenders should reach us before 14:00 hours on the due date
 Tenders will be opened at 14:30 hours on the due date
 Tenders would be opened in presence of the tenderers who have submitted their offers and who may like to be present

Yours faithfully,
 For BHARAT HEAVY ELECTRICALS LIMITED

Sr.Manager / MM / Capital Equipment

PART A

CONVENTIONAL HORIZONTAL BORING MACHINE – Dia 110 mm

SECTION – I : QUALIFYING CRITERIA

The BIDDER has to compulsorily meet the following requirements to get qualified for considering the technical offer for the HORIZONTAL BORING MACHINE – SPINDLE Ø 110

S. No.	REQUIREMENTS	VENDOR's RESPONSE
1	<p>Only those vendors (OEMs), who have supplied and commissioned at least ONE HORIZONTAL BORING MACHINE (Spindle size 110 mm or higher with Spindle travel 500 mm or higher) in the past ten years (from the date of opening of Tender) and such machine is presently working satisfactorily for more than one year after commissioning (from the date of opening of Tender) should quote.</p> <p>However, if such machine had already been supplied to BHEL, then that machine should be presently working satisfactorily for more than six months after its commissioning and acceptance (from the date of opening of Tender).</p>	
The vendor should submit following information where similar machine has been supplied for qualification of their offer.		
1.1	Name and postal address of the customer or company where similar machine is installed.	
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	Application for which the machine is supplied	
1.6	Performance certificate from the customer regarding satisfactory performance of machine supplied to them. A suggested format for performance certificate is enclosed in SECTION - IV	
2.0	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.	

PSG

GCS

KPL

SSP

RDR

AVC

NRM

SECTION – I I

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

S. No.	REQUIREMENTS	VENDOR's RESPONSE
3.0	The BIDDER/VENDOR to furnish Reference List of Customers, with full address, details of contact person, where HORIZONTAL BORING MACHINES have been supplied in the past.	
4.0	Details of HORIZONTAL BORING MACHINES supplied to other BHEL units, if any. (Year of commissioning, Spindle size of machine, Spindle motor power)	
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.	

PSG

GCS

KPL

SSP

RDR

AVC

NRM

SECTION – III

The BIDDER to note:

S. No.	PARTICULARS	VENDOR'S RESPONSE
7.0	The BIDDER / VENDOR shall submit the offer in TWO PARTS. 1. Technical Offer [with PART A & PART B] & Commercial Offer 2. Price Bid.	
8.0	The Technical Offer shall contain a comparative statement of Technical Specifications demanded by BHEL and Offer Details submitted by the Bidder , 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.	

PSG

GCS

KPL

SSP

RDR

AVC

NRM

SECTION – IV

The performance certificate should be produced **on Customer's Letter Head.**

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 Size b) Spindle travel c) Spindle Power d) Table Size e) WT. Carrying Capacity	
6. Performance of the Machine (Strike off whichever is not applicable)		Best in the market / Satisfactory / Good / Average / Not Satisfactory
7. Any Other remarks		
<div>Date:</div> <div>Signature & Seal of the Authority Issuing the Performance Certificate</div>		

PSG

GCS

KPL

SSP

RDR

AVC

NRM

PART- B**Technical Specification of Conventional Horizontal Boring Machine- Dia 110 mm**

Clause	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER With Technical Details																									
1.0	<p>PURPOSE: This machine is intended for machining of castings and forgings meant for manufacturing valves. Various operations to be carried out are Facing, OD Turning, Boring, Milling, Drilling & Tapping, and Thread cutting (Internal and External)</p> <p>NOTE: The machine will be subjected to intermittent load as machining will be carried out on stellite / SS hard-faced surfaces. These hard-faced surfaces will have hardness in the range of 425 BHN.</p>																										
1.1	<p>WORKPIECE MATERIAL SPECIFICATION:</p> <p>The work piece material is either Steel Casting or Steel Forging.</p> <table><tr><th>Material</th><th>Description</th><th>ASTM Specification</th><th>Hardness</th></tr><tr><td rowspan="4">Steel Casting</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 Forging</td><td>Carbon Steel</td><td>SA 105</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> <p>NOTE: Certain stellite / SS hard faced surfaces of the work pieces having hardness of 425 BHN will have to be machined.</p>	Material	Description	ASTM Specification	Hardness	Steel Casting	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 Forging	Carbon Steel	SA 105	185 BHN	Alloy Steel	SA 182 F22 Class 3	210 BHN	SA 182 F91	225 BHN	
Material	Description	ASTM Specification	Hardness																								
Steel Casting	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 Forging	Carbon Steel	SA 105	185 BHN																								
	Alloy Steel	SA 182 F22 Class 3	210 BHN																								
		SA 182 F91	225 BHN																								

Clause	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
2.0	MACHINE DETAILS:		
2.1	CONFIGURATION & CONSTRUCTION:		
2.1.1	<div>1. The machine shall have column in rectangular section with heavy ribs for rigidity.</div> <div>2. Bed shall be of double wall construction amply ribbed and widely spaced guide ways.</div> <div>3. Rotary table with Hydraulically operated index pin for accurate positioning of 4x90 degrees.</div> <div>4. Sufficient guiding length for the spindle-sleeve system for rigidity.</div> <div>5. Automatic hydraulically actuated multipoint clamps for all slides.</div> <div>6. Automatic centralised lubrication system.</div> <div>7. DRO system for all axes (Head stock Vertical, Table cross, longitudinal, Table rotation, Facing slide, Spindle axial travel).</div>		
2.1.2	Vendor to furnish constructional details of the machine including explanatory drawings of various components/ assemblies like Headstock, Facing Unit, Tool Holder Slide, Machine Bed, etc. of the machine with details of material & their hardness.	Vendor to Furnish	
2.1.3	Video images on CD / Hard copy of literature with photographs & drawings explaining the technical features should be enclosed with the offer	Vendor to Submit	
2.1.4	Machine should be Metric execution. (Construction wise)	Vendor to Confirm	
2.1.5	Head Stock Counter balancing System. (Details of the offered system to be submitted)	Vendor to Submit	

Clause	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
2.2	HEADSTOCK:		
2.2.1	Box type geared Headstock with integral facing head. It should be possible to use spindle without dismantling or removing the facing head.	Vendor to specify the arrangement of head- stock briefly.	
2.2.2	Spindle Diameter: Min 110 mm	Vendor to specify	
2.2.3	Max Height of spindle axis over table: 1200 mm	Vendor to specify	
2.2.4.	Min Height of spindle axis over table:	Vendor to specify	
2.2.5	Feed range of vertical travel	Vendor to specify	
2.2.6	Spindle taper: ISO 50	Vendor to confirm	
2.2.7	Axial traverse of Boring Spindle: Min 600 mm	Vendor to specify	
2.2.8	Working Feed range of spindle travel	Vendor to specify	
2.2.9	Rapid feed rate of spindle axial travel	Vendor to specify	
2.2.10	Spindle speed range: approx. 10 – 1000 RPM	Vendor to specify	
2.2.11	No. of speeds (for spindle rotation)	Vendor to Specify	
2.2.12	Spindle drive power (AC Continuous Rating - S1): Around 12 KW	Vendor to specify	
2.2.13	Continuous variation of working Feed for spindle axial traverse (automatic)	Vendor to confirm	
2.2.14	Torque-Power-Speed characteristics of the spindle system to be submitted by the vendor along with offer	Vendor to submit	
2.2.15	Arrangement for Forward and reverse rotation of spindle with suitable braking mechanism.	Vendor to confirm	

Clause	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
2.3	FACING HEAD:		
2.3.1	Facing Head Diameter	Vendor to specify	
2.3.2	Maximum Diameter-Facing: 800 mm	Vendor to specify	
2.3.3	Maximum Diameter-Boring:	Vendor to specify	
2.3.4	Speed of Rotation	Vendor to specify	
2.3.5	Facing head Slide Traverse Min. 150 mm	Vendor to specify	
2.3.6	Feed range of facing head slide	Vendor to specify	
2.3.7	Rapid Feed of facing head slide	Vendor to specify	
2.4	ROTARY TABLE:		
2.4.1	Table size: 1200 mm X 1200 mm	Vendor to Specify	
2.4.2	Maximum weight of the job (on table): 4000 Kgs.	Vendor to confirm	
2.4.3	Min distance from facing head to edge of table	Vendor to specify	
2.4.4	Table Longitudinal travel (No boring stay): Min 1250 mm	Vendor to specify	
2.4.5	Table Cross travel: Min 1500 mm	Vendor to specify	
2.4.6	Feed range for table longitudinal and cross traverse	Vendor to specify	
2.4.7	Rapid Feed for table longitudinal and cross traverse	Vendor to specify	
2.4.8	Manual Feed for spindle axial traverse (with Hand wheel)	5 mm / rev	
2.4.9	Rotary table with Hydraulically operated index pin for accurate positioning of 4x90 degrees.	Vendor to Confirm	
2.4.10	Number of indexing positions	3 60 000	
2.4.11	T slot size	Vendor to specify	
2.4.12	T slot pitch	Vendor to specify	
2.5	<u>Metallic Telescopic Covers</u> Metallic Telescopic Covers of rust resistant material to be provided with wipers for the traversing axes. Telescopic covers should be sealed to avoid mixing of coolant & hydraulic oil. Column guide ways are to be completely covered.	Vendor to Confirm	

Clause	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
2.6	OPERATOR'S PANEL:		
2.6.1	Operator's panel having complete machine control system shall be provided for convenient and efficient operation. DRO system shall be supplied for all axes (Head stock Vertical, Table cross, longitudinal, Table rotation, Facing slide, Spindle axial travel) All switches should be within reach of operator.	Vendor to Submit	
2.7	MACHINE LIGHTS:		
2.7.1	Machine Lights for sufficient illumination of complete working area on all sides of operator's location should be provided.	Vendor to Confirm	
2.7.2	All light fittings, consumables, adapters/receptacles should have compatibility with Indian equivalents.	Vendor to Confirm	
2.8.3	Voltage shall be 24 V for the hand lamp.	Vendor to Confirm	
2.8	HYDRAULIC SYSTEM:		
2.8.1	Make: Rexroth / Vickers Sperry or any other reputed make acceptable to BHEL	Vendor to specify	
2.8.2	Hydraulic system should be centralized. Hydraulic Tank shall preferably be located at floor level All hydraulic pipelines to be neatly laid out. (Details should be furnished at contract stage)	Vendor to Confirm	
2.8.3	Hydraulic circuits shall be designed with minimum number of control valves and to suit oil of ISO VG 46 or 68 only. Also minimum number of check-points to be provided wherever pressure is required to be read for setting and trouble shooting. MINIMESS Pressure Gauge - 1 No with Connecting Hose to be provided.	Vendor to Confirm	
2.8.4	The control voltage for all solenoid operated valves	24 V DC	
2.8.5	Filtration System, Details to be submitted.	Vendor to specify	
2.8.6	Hydraulic pump capacity (flow / pressure)	Vendor to specify	

Clause	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
2.8.7	Each pump should have an independent motor.	Vendor to Confirm	
2.9	First filling of all required Oils & Grease etc. Should be supplied by vendor. Oil grade: ISO VG46 or 68 Grease: Servo gem grade 2 (preferred) Indigenous (Indian) source or Indian equivalent and specifications of oils/ greases are also to be provided by the vendor.	Vendor to specify	
2.10	COOLANT SYSTEM:		
2.10.1	Re-circulating type Flood Coolant System, with all accessories shall be provided.	Vendor to Confirm	
2.10.2	Coolant Pressure & flow rate to be furnished.	Vendor to Furnish	
2.10.3	Coolant collection and re-circulation system shall be leak proof to avoid spillage on shop floor.	Vendor to Confirm	
2.10.4	Coolant Filtration System: Re-circulating type with suitable filtration unit. Vendor shall give details of offered filtration unit.	Vendor to specify	
2.10.5	Coolant pump & motor details to be submitted with the offer.	Vendor to specify	
2.10.6	The coolant tank should be fitted with skimmer for regular cleaning of coolant from contamination with tramp oil.	Vendor to Confirm	
2.11	ELECTRICAL SYSTEM:		
2.11.1	415V $\pm 10\%$, 50HZ ± 3 HZ, 3 Phase AC (3 wire system with out neutral) Power Supply Source 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 is to be informed by vendor well in advance so that it could be incorporated during construction of foundation.	Vendor to specify	

Clause	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
2.11.2	Tropicalisation: All electrical / electronic equipment shall be tropicalized	Vendor to Confirm	
2.11.3	All electrical & electronic control cabinets & panels should be dust and vermin proof and shall have IP 54 protection.	Vendor to Confirm	
2.11.4	All electrical components in the cabinets should be mounted on DIN Rail	Vendor to Confirm	
2.11.5	All electrical and electronic panels including operator's panel 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	
2.11.6	Motors shall conform to IEC or Indian Standards	Vendor to Confirm	
2.11.7	All cables moving with traversing axes should be installed in Caterpillar/ Drag chain. Additionally, all the cable trays required for laying the cables shall be included in the offer.	Vendor to Confirm	
2.11.8	Vendor should ensure proper earthing for the machine and its peripherals.	Vendor to Confirm	
2.12	SAFETY ARRANGEMENTS:		
2.12.1	Following safety features in addition to other standard safety features should be provided in the machine:	Vendor to Confirm	
2.12.2	All the pipes, cables etc. on the machine should be well supported and protected.	Vendor to Confirm	
2.12.3	All rotating parts used on the machine should be statically & dynamically balanced to avoid undue vibration.	Vendor to Confirm	
2.12.4	Emergency Switches at suitable locations as per International Norms are to be provided	Vendor to Confirm	
2.12.5	Oil & water pipe lines should not run with electrical cable in the same tray / trench.	Vendor to Confirm	

Clause	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
2.13	ENVIRONMENTAL PERFORMANCE OF THE MACHINE:		
2.13.1	The Machine should confirm to following factors related to environment:	Vendor to Confirm	
2.13.2	The noise level shall not exceed 85 dB(A) at normal load condition, 1 meter away from the machine.	Vendor to Confirm	
2.13.3	There shall not be any emissions from the machine except fumes of cutting fluid during machining.	Vendor to Confirm	
2.13.4	If any safety / environmental protection enclosure is required it should be built in the machine by the vendor.	Vendor to specify	
2.13.5	Paint of the machine should be oil / coolant resistant and should not peel off and mix up with coolant.	Vendor to Confirm	
3.0	Compressed air points:		
3.1	Compressed air at 60 to 70 psi will be made available at one point. The vendor shall indicate the inlet point for compressed air in the layout drawing of the machine.	Vendor to Confirm	
4.0	TOOLING:		
4.1	Refer Annexure-1 & 2 for near about model of Tool holding arrangement for operations using facing head. List of tooling required: A. For Turning / Boring application: 1. Base holder 250mm long to suit Facing slide: 1 No. 2. Dia 100 mm Extension Bar of working Length 500mm with tool slot 25x25: 1 No. 3. Dia 80 mm Extension Bar of working Length 325mm with tool slot 25x25: 1 No. Extension bars shall be used with the base holders.	Vendor to Confirm	

Clause	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
4.2	B. For Facing application: 1. Base holder 250mm long to suit Facing slide: 1 No. 2. Dia 100 mm Extension Bar of working Length 500mm with tool slot 25x25: 1 No. 3. Dia 80 mm Extension Bar of working Length 325mm with tool slot 25x25: 1 No. Extension bars shall be used with the base holders.	Vendor to Confirm	
4.3	All tools, tool holders, arbors etc necessary to machine the test pieces shall be supplied by the vendor. V Block in pairs (for job dia range of 200 mm to 550 mm) and chain clamping arrangement shall be supplied. Itemized pricing of the above items must be indicated separately in the price bid. The technical offer should contain the unpriced list.	Vendor to specify	as mentioned under Clause "Machine Acceptance"
5.0	LEVELING & ANCHORING SYSTEM		
5.1	Complete anchoring system including foundation bolts, anchoring materials, fixators, leveling shoes etc shall be supplied for the Machine, Rotary Table, Floor Plates etc.	Vendor to Confirm	
6.0.	TOOLS FOR OPERATION & MAINTENANCE:		
6.1	The vendor shall also supply necessary standard tools like Torque Wrench, Spanners, Keys, grease guns etc. for operation and maintenance of the machine. List of all such standard / Special tools shall be submitted with offer	Vendor to Confirm Vendor to Submit	

Clause	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER With Technical Details	
7.0	SPARES:		
7.1	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 a) Mechanical & hydraulic spares: b) Electrical & electronic spares: c) Un-priced list of spares with quantities, specified in a & b above, should be submitted with this technical offer. d) Unit Price of each item figuring in c shall be submitted in a sealed cover with the price bid.	Vendor to Submit	
7.2	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 it's suppliers to enable BHEL to procure them in advance.	Vendor to Confirm	
7.3	In case of ordering, a complete list of spares for the machine and its accessories along with spares specification / type / model, and name & address of the spare supplier shall be submitted along with documentation while supplying the machine.	Vendor to Confirm	
8.0	DOCUMENTATION:		
8.1	3 sets of following documents (3 Hard copies) in English language should be supplied along with the machine	Vendor to confirm	
8.2	Operating manuals of Machine	Vendor to confirm	
8.3	Detailed Maintenance manual of machine with all drawings of machine assemblies/sub-assemblies/parts including Electrical / Pneumatic/ Coolant / Hydraulic circuit diagrams.	Vendor to confirm	

Clause	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
8.4	Manufacturing drawings for all supplied tool holders, coolant connections, adapters, sleeves, fixtures etc.	Vendor to confirm	
8.5	Catalogues / O&M Manuals of all bought out items.	Vendor to confirm	
8.6	Detailed specification of all rubber items and hydraulic/lube fittings	Vendor to confirm	
8.7	Bearings: Make& Specification for all bearings used in the machine.	Vendor to Specify	
8.8	PLC program printouts (Ladder diagram & Statement list) with comments in English.	Vendor to confirm	
8.9	PLC program on CD.	Vendor to confirm	
8.10	Complete back up of hard disk on GHOST CD and clear written Instructions (1 copy) to take back up and reloading of a new hard disk.	Vendor to confirm	
8.11	The vendor shall submit complete Master List of parts used in the machine.	Vendor to Submit	
8.12	One additional set of all the above documentation on CD ROM, wherever possible.	Vendor to confirm	
9.0	TRAINING:		
9.1	The Vendor shall train Three BHEL Engineers in Operation and Maintenance (Mechanical, Electrical/ Electronics) of the Machine at Vendor's works for a period not exceeding 5 working days.	Vendor to confirm	
9.2	Airfare, boarding & lodging for the BHEL Engineers shall be borne by BHEL.		
9.3	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	

Clause	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
9.4	Competent, English speaking experts shall be arranged by the vendor during training for satisfactory & effective training of BHEL personnel	Vendor to confirm	
9.5	Vendor to quote on the basis of per man per Day for training at vendor's work	Vendor to specify	
10.0	FOUNDATION:		
10.1	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 accessories. BHEL shall construct complete foundation for the machine.	Vendor to confirm	
10.2	The Vendor shall indicate detailed specifications of grouting compound, Grouting procedure etc. for foundation bolts of the machine.		
11.0	ERECTION & COMMISSIONING		
11.1	<p>1. Complete erection and commissioning of the machine (including labour and material handling), its control system, all attachments and equipments supplied along with the machine are in the scope of the vendor. Also start up, testing of the machine and machining of test pieces are in the scope of the vendor.</p> <p>2. Service requirement like power, air & water will be provided by BHEL at only one point to be indicated by supplier in their foundation/layout drawing.</p>	Vendor to confirm	

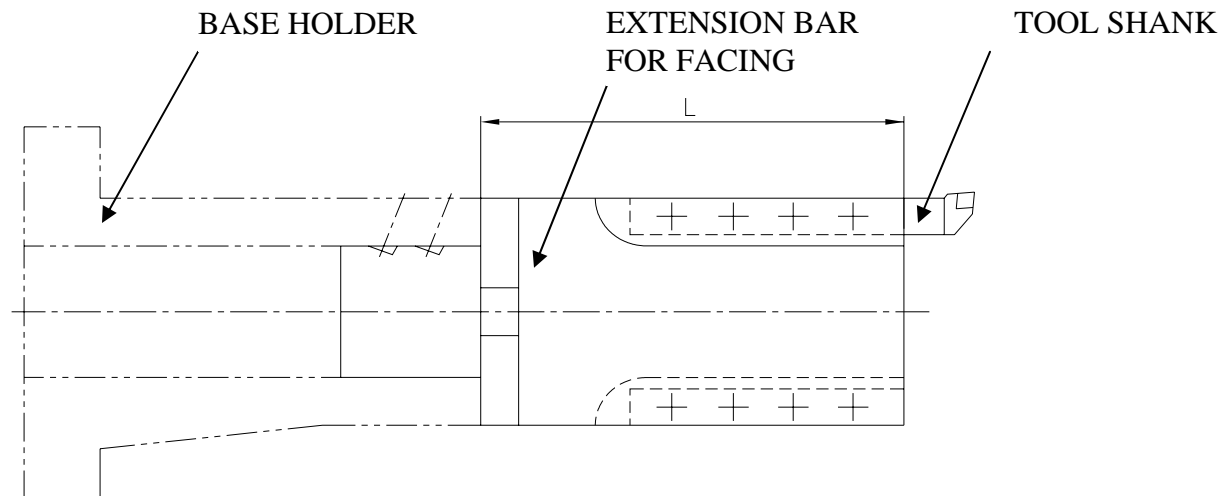
Clause	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
11.2	Proving the capacity and good performance of the machine shall be considered as part of commissioning. All tests, mentioned under the clause " Machine Acceptance " should form part of the commissioning activity.	Vendor to confirm	
11.3	The supplier should bring tools, Tackles, instruments and other necessary equipments required to carry out all above activities.	Vendor to confirm	
11.4	The supplier shall arrange commissioning spares required for commissioning of the machine.	Vendor to confirm	
11.5	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	
11.6	Schedule of Erection and Commissioning shall be submitted with the offer.	Vendor to confirm	
11.7	Duration, terms & conditions for E&C should be furnished with the technical offer in detail. Charges for Erection & Commissioning shall be submitted with the price bid.	Vendor to confirm	
12.0	ACCURACY TESTS:		
12.1	GEOMETRICAL ACCURACY:		
12.1.1	Geometrical Accuracy Tests shall be in accordance with standard test chart. 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 submit	

Clause	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
12.1.2	All the above accuracies to be demonstrated to BHEL engineers during pre-acceptance tests at Suppliers works and during Erection & Commissioning at BHEL Works.	Vendor to confirm	
13.0	AMBIENT CONDITIONS & THERMAL STABILITY:		
13.1	Power Supply : AC 415 V \pm 10% Frequency : 50 Hz \pm 3HZ Phases : 3 phase 3 wire system Compressed air supply: 60-70 psi Ambient Temperature: max 50 °C Relative Humidity = 85% (Vendor to confirm that machine is suitable for above conditions)	Vendor to confirm	
13.2	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 machine is suitable for above)	Vendor to confirm	
13.3	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	
13.4	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	
14.0	MACHINE ACCEPTANCE:		
14.1	Tests/Activities to be carried out at supplier's works on the machine before despatch:	Vendor to Confirm	
14.1.1	Geometrical Accuracy Tests as per test chart provided by the vendor.	Vendor to Confirm	

Clause	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER With Technical Details
14.1.3	The machine shall be test run continuously for 24 hrs. If any break down occurs during this test, the test will be repeated again for 24 hrs from restarting.	Vendor to Confirm
14.1.4	Demonstration of all features of the machine and all Accessories.	Vendor to Confirm
14.1.5	Machining of Test Piece. Vendor to supply test piece and tooling for it's machining.	Vendor to Confirm
14.2	Tests/Activities to be carried out at BHEL works while commissioning the machine:	Vendor to Confirm
14.2.1	Geometrical Accuracy Tests as per test chart	Vendor to Confirm
14.2.2	Full load test to demonstrate the maximum power & cutting capacity of the machine.	Vendor to Confirm
14.2.3	The machine shall be tested for continuous running of 24 hrs. If any break down occurs during this test, the test should be repeated for 24 hrs from that time.	Vendor to Confirm
14.2.4	Demonstration of all features of the machine and all Accessories.	Vendor to Confirm
14.2.5	Machining of Test Piece. Vendor to supply test piece and tooling for it's machining.	Vendor to Confirm
15.0	PACKAGING:	
15.1	Sea worthy, rigid packing for all items of machine and all Accessories 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	GUARANTEE:	
16.1	12 months from the date of acceptance of the machine.	Vendor to Confirm

Clause	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
17.0	GENERAL:		
17.1	The vendor should submit the following information:	Vendor to confirm	
17.2	Machine Model	Vendor to specify	
17.3	Total connected load (KVA):	Vendor to specify	
17.4	Floor area required (Length, Width, Height) for complete machine & accessories.	Vendor to specify	
17.5	Painting of Machine/ Electrical Panels: RAL 6011 Apple Green (Polyurethane Paint)	Vendor to Confirm	
17.6	Total weight of the machine	Vendor to specify	
17.7	Weight of heaviest part of machine	Vendor to specify	
17.8	Weight of the heaviest assembly/ subassembly of the Machine	Vendor to specify	
17.9	Dimensions of largest part/ subassembly of the machine	Vendor to specify	

Annexure-1&2: Sketch showing approximate configuration of Tool holder for facing head slide.

Annexure-1: Approximate Configuration of Tool holder for facing head slide**For Facing Application**

Annexure-2: Approximate Configuration of Tool holder for facing head slide**For Boring Application**