



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 7421/7775

Fax : +91 431 257 6826

Email : vkarna@bhel.in

: kumar.virendra@bhel.in

Web : www.bhel.com

TWO PART BID

Enquiry
Number:

Enquiry Date:

Due date for submission
of quotation:

Tender to be submitted in two parts

2622000013

11.06.2020

03.07.2020

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	Description	Qty.	(Indigenous Vendors) Matl. Will be Delivered to
10	Procurement of Slant Bed CNC Lathe as per the technical specification, BHEL commercial terms & conditions applicable (to be downloaded from web site www.bhel.com and https://eprocure.gov.in/epublish/app)	01 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 (By indigenous vendors): As stated above.
2. Delivery required 4 months from the date of purchase order.
3. Erection & Commissioning period required 4 weeks from the date of intimation by BHEL to vendor for deputation of their Engineers for E&C.
4. EMD for this Tender will be (INR): 1,50,000.00.
5. Compliance Forms ATP/IND/06 to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.
6. BHEL shall be resorting to Reverse Auction (Guidelines as available on www.bhel.com). Refer MM / CE / GENL /001 – EMD.
7. 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> or from Central Public Procurement Portal website <https://eprocure.gov.in> under Enquiry above enquiry reference.

Note: this is not an E-tender, hence Vendors are requested to ensure that the offer is reaching physically at our office before 14:00 Hrs. on the date of tender opening.

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


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

SLANT BED CNC LATHE, Qty. 1 no.

Part A - Qualifying Criteria

S.No	BHEL Specification	Bidder's Offer
1.0	QUALIFYING CRITERIA	
1.1	Only those Bidder / OEM who have manufactured, supplied and commissioned at least ONE SLANT BED CNC LATHE in the last 5 years (as on the first date of tender opening) are eligible to quote.	
1.2	Bidder has to submit at least ONE Performance Certificate from their customer (end user), for satisfactory performance of SLANT BED CNC LATHE meeting the following conditions: a) The Equipment must have been supplied within the last 5 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 Slant bed CNC lathes 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] & Commercial and 2. 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.	
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.	

R. Raj
29.05.2020
ATP/production
[R. Rajivarma]

(Signature)
CK. PALANIVEL
MBS

(Signature)
29.05.2020
Modn
PRINCE DEVAJI

S.No	BHEL Specification	Bidder's Offer
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.	

R. 
ATP/production


MBS


Modi

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: Slant bed type lathe Yes / NO
(Strike off whichever is not applicable)
- 4 Controls: CNC type Yes / NO
(Strike off whichever is not applicable)
- 5 Spindle Motor capacity in kW:
- 6 Application for which the equipment is used
- 7 Performance of the equipment Satisfactory / Not Satisfactory
(Strike off whichever is not applicable)
- 8 Service support after sales Satisfactory / Not Satisfactory
(Strike off whichever is not applicable)
- 9 Any Other remarks
- 10 This performance certificate was issued on: (DD/MM/YYYY)

Authority

Signature & Seal of the

Issuing the Performance Certificate

Contact details of issuing authority

Name & Designation:

Office No/ Mobile no:

Email ID:

P. R. S.
ATP/production

[Signature]
MRS

[Signature]
Modn

SLANT BED CNC LATHE, Qty. 1 no.

Part B – Technical Specification

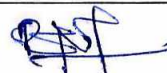
S No	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details	
1.0	PURPOSE: This Lathe is intended for machining, Turning, Boring, Facing, threading (external / Internal), drilling and profile machining of Various BHEL components.		Bidder to confirm	
1.1	JOB MATERIAL DETAILS:		Bidder to confirm	
	Specification	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
1.2	Job Details: Max 400mm OD and Job weight: Maximum 500kg		Bidder to confirm	
2.0	MACHINE SPECIFICATION			
2.1	Configuration and capacity			
2.1.1	Type of Bed	Slant Bed type		
2.1.2	Slant angle from vertical	Bidder to specify		
2.1.3	Maximum Turning Diameter over cross slide: 400 mm or higher	Bidder to specify		
2.1.4	Swing Over Carriage wings	Bidder to specify		
2.1.5	Maximum dia of Job to be held in chuck: 430mm or higher	Bidder to specify		
2.1.6	Turning length required between centers: 1000 mm minimum	Bidder to specify		
2.1.7	Max. Weight carrying capacity with / without tailstock; 500 kgs or Higher	Bidder to specify		
2.1.8	Chuck: Hydraulic 3 Jaw self-centering hollow chuck with hard Jaws.	Bidder to confirm		

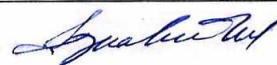
R. Raju
27/5/2020
ATP/production
(R. Raju)

[Signature]
M&S

[Signature]
Modin

S No	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER With Technical Details
2.1.9	Chuck size (bidder to consider that the jaws should not protrude too much outside while turning maximum dia of job)	Bidder to specify
2.1.10	Provision for Dual chucking pressure and selection of two pre-set chucking pressures.	Bidder to confirm
2.1.11	Carriage (Z-axis) travel stroke and mechanism:	Bidder to specify
2.1.12	Cross (X-axis) travel stroke and mechanism:	Bidder to specify
2.1.13	Metallic Telescopic Covers of rust resistant material shall be provided with wipers for guide ways of traversing axes.	Bidder to specify
2.2	SPINDLE	
2.2.1	Spindle nose: A2-8 or equivalent	Bidder to specify
2.2.2	Hole through Spindle –Minimum 70mm	Bidder to specify
2.2.3	Spindle power in kW (100% Duty Cycle).	Bidder to specify and provide calculation details
2.2.4	Spindle Motor: Shall be AC Servo Spindle motor of make Siemens/ Fanuc (Details like model, make, type etc. to be submitted with the offer)	Bidder to specify
2.2.5	Spindle speed (Steplessly variable type): 35 to 3000 rpm	Bidder to confirm
2.2.6	Number of speed ranges (Selectable through program):	Bidder to specify.
2.3	TAIL STOCK:	
2.3.1	Quill: Built-in type tailstock quill.	Bidder to confirm.
2.3.2	Quill stroke:	Bidder to specify.
2.3.3	Quill/tailstock movement by Hydraulic	Bidder to confirm.
2.3.4	Tailstock travel distance	Bidder to specify.
2.3.5	Quill diameter:	Bidder to specify.
2.3.6	Quill taper: MT4	Bidder to confirm.
2.3.7	Tail stock center- cone angle : 60 Degree	Bidder to confirm.
2.3.8	Max thrust on the Quill:	Bidder to specify.

ATP/production : R. 

M/S 

Modn 

S No	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER With Technical Details
2.4	TURRET:	
2.4.1	Type: Disc VDI 40 with hydraulic Indexing	Bidder to confirm
2.4.2	No. of tool stations: 12	Bidder to confirm
2.4.3	Turret indexing- bi-directional, Random:	Bidder to confirm
2.4.4	Type of Tool Holders: VDI 40	Bidder to confirm
2.4.5	Tool Shank size: 25mm x 25mm	Bidder to confirm
2.4.6	Max Boring bar size: 40 mm	Bidder to confirm
2.4.7	Live head for drilling	Bidder to confirm
2.4.8	Make and Model & make of turret:	Bidder to specify
2.4.9	Coolant should reach up to tool tip in the tool holders. The drilling head in the Turret should have through coolant facility	Bidder to confirm
2.4.10	Automatic operation / selection / indexing of turret through CNC program:	Bidder to confirm
2.4.11	Additionally manual operation / selection through push buttons	Bidder to confirm
2.5	FEEDS AND DRIVE SYSTEM:	
2.5.1	Feed Rate in X (Cross travel) & Z (Longitudinal travel) Axes (Steplessly variable type): 0-5000mm/min or more	Bidder to specify
2.5.2	Rapid Feed Rate in X & Z Axes: 0-10000mm/min or more	Bidder to specify
2.5.3	Max Motion feed rate in X & Z axis	Bidder to specify
2.5.4	Maximum threading rate	Bidder to specify
2.5.5	The axis drives & motors shall be AC servo drives of digital type and AC servo motors respectively. The make shall be of Siemens/Fanuc (Details like model, make, type etc. to be submitted with the offer). AC servo Motor ratings to be specified for both the axis and the drive offered should cater the power requirement of the motor	Bidder to specify
2.5.6	Feedback system for X & Z axes: Siemens / Heidenhain/Fanuc encoders or any other make acceptable to BHEL (Details to be submitted with the offer.)	Bidder to specify
2.5.7	Mechanism for locking / clamping the axes:	Bidder to specify

P. P. P.
APP/production

MDS

[Signature]

[Signature] Page 3 of 18
Modn

S No	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
2.5.8	Type of power transmission: Pre-loaded backlash-free recirculating ball screw drive or better for feed drive axes. Details of ball screw or equivalent used in the machine shall be submitted.	Bidder to specify	
2.6	OPERATION AND CONTROL SYSTEM:		
2.6.1	OPERATOR'S PANEL:		
2.6.2	Preferably Swiveling type operator's panel having complete CNC and machine control system with Digital display of required configuration shall be provided at an ergonomically suitable location. All switches should be within reach of operator for easy & safe operation. All displays/indications should also be conveniently placed accordingly. Layout showing complete details should be submitted.	Bidder to submit	
2.7	CNC SYSTEM & FEATURES:		
2.7.1	Make: Siemens/Fanuc	Bidder to specify	
2.7.2	Simultaneous interpolation of two axes to be provided	Bidder to Confirm	
2.7.3	Model: Suitable and latest compatible version should be supplied.	Bidder to specify	
2.7.4	Details of Standard features: List to be submitted by Bidder.	Bidder to specify	
2.7.5	Details of optional features, recommended by bidder:	Bidder to specify	
2.7.6	The system should have full alphanumeric keyboard, color display (10" or more), USB Port for data input/output, CF(Compact Flash) card slot, port for printer, network ready for LAN, graphic simulation and preinstalled system software & other required software etc.	Bidder to confirm & submit details	
2.7.7	The CNC System shall also have the below mentioned features. a) Part Program Memory: 2 MB or more b) Pitch error compensation c) Backlash Error Compensation Facility d) Graphics simulation of Part Program and Machining process.	(Details should be submitted by Bidder).	

ATP/production: R. P. P.

M/S. S. S. S.

Modi Devan

S No	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
2.7.8	UPS of 10 minutes capacity for CNC system with inbuilt cooling and charge status display-in case of PC based PLC system.	Bidder to specify	
2.8	MANUAL CONTROL:		
2.8.1	Complete manual control of machine with required switches/ keys should be provided on operator's panel for selection of required axis, axis direction, cutting feed, spindle speed, cutting feed on/off, display of axis position values etc. for manual operation without using CNC program, CNC option Manual Turn or MDI mode. Diagrams/ sketches for switches/ keys provided on operator pendent should be submitted.	Bidder to confirm	
2.8.2	Hand Held unit (auxiliary pendant) with jog axes/spindle inching/ hand-wheel and sufficient length of interfacing cable), which can be taken near to the chuck for job setting and similar other purposes to be provided.	Bidder to confirm	
2.9	MACHINE LIGHTS:		
2.9.1	Machine Lights for sufficient illumination of complete working area should be provided for clear visibility. 24V LED light fitting preferred.	Bidder to confirm	
2.9.2	Provision of 24 V hand lamp with sufficient cable length.	Bidder to confirm	
2.9.3	All light fittings, consumables, adapters/receptacles should have compatibility with Indian equivalents	Bidder to confirm	
2.9.4	Flashing / rotary type End of Cutting and Program Stop Light.	Bidder to confirm	
2.10	AIR CONDITIONERS:		
2.10.1	Air Conditioners with Dehumidifiers of suitable capacity to be provided for all Electrical / Electronic Panels / Cabinets including Operator's Panel considering specified ambient conditions. Make: Rittal / Warner & Finley or any other reputed make acceptable to BHEL.	Bidder to Confirm	
2.11	HYDRAULIC SYSTEM:		
2.11.1	Make: Rexroth / Vickers or any other reputed make acceptable to BHEL	Bidder to specify	

R. R. J.
ATP/production

[Signature]
MBS

[Signature]
Modn

S No	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER With Technical Details
2.11.2	Hydraulic system should be centralized. Hydraulic Tank shall preferably be located at floor level. All hydraulic pipelines to be neatly laid out.	Bidder to confirm
2.11.3	Hydraulic circuits shall be designed with minimum number of control valves and to suit oil of ISO VG 68 or equivalent only. Also minimum number of check- points to be provided wherever pressure is required to be measured for setting and trouble shooting. MINIMESS Pressure Gauge - 1 No with Connecting Hose to be provided.	Bidder to confirm
2.11.4	Control voltage for all solenoid operated valves shall be 24V DC	Bidder to confirm
2.11.5	Filtration System:	Bidder to specify
2.11.6	Failure indication:	Bidder to specify
2.11.7	Automatic shut off provision.	Bidder to submit
2.11.8	Refrigerated type cooling system of sufficient capacity to maintain complete Hydraulic System, including lubrication oil, hydraulic oil and gearbox oil, etc. at a temperature not exceeding 50 °C irrespective of the ambient conditions. Bidder should submit complete details.	Bidder to specify
2.11.9	Hydraulic pump capacity (flow / pressure):	Bidder to specify
2.11.10	Each pump should have an independent motor.	Bidder to confirm
2.12	Centralized lubrication system for all elements requiring intermittent lubrication viz. guide ways, lead screws, gears spindle etc	Bidder to provide details
2.13	First filling of all required Oils & Grease etc. Should be supplied by bidder. Oil grade: ISO VG68 or Equivalent Grease: Servo gem grade 2 (preferred.) Indigenous (Indian) source or Indian equivalent and specifications of oils/ greases are also to be provided by the bidder.	Bidder to specify
2.14	COOLANT SYSTEM:	
2.14.1	Recirculating type Coolant System for all 12 positions of turret with all accessories shall be provided.	Bidder to confirm
2.14.2	Coolant operation shall be enabled through program.	Bidder to confirm

APP/ production : R. R. R.

Mes Sulu 24

Moder Jeyan

S No	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER With Technical Details
2.14.3	Coolant on / off by push buttons on the Operator's panel also.	Bidder to confirm
2.14.4	Coolant Pressure:	Bidder to Furnish
2.14.5	Coolant flow rate:	Bidder to Furnish
2.14.6	Coolant collection and recirculation system should be leak proof to avoid spillage on shop floor.	Bidder to Confirm
2.14.7	Coolant Filtration System: Re-circulating type with suitable filtration unit. Bidder shall give details of offered filtration unit.	Bidder to submit
2.14.8	Coolant flow diagram showing filters, pumps, valves, tanks etc. to be submitted.	Bidder to submit
2.14.9	Coolant pump & coolant motor detail to be submitted.	Bidder to submit
2.14.10	Coolant Tank Capacity:	Bidder to specify
2.14.11	The coolant tank should be fitted with skimmer for regular cleaning of coolant from contamination with tramp oil.	Bidder to Confirm
3.0	ELECTRICAL:	
3.1	415V $\pm$ 10%, 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. 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 bidder. 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
3.2	All electrical & electronic control cabinets & panels should be dust and vermin proof and shall have IP 54 protection.	Bidder to Confirm
3.3	All electrical components in the cabinets should be mounted on DIN Rail No component should be mounted on the bottom surface of the control panel.	Bidder to Confirm

R. R. R.
ATP/production

[Signature]
M&S

[Signature]
Devasi
Modi

S No	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER With Technical Details
3.4	All electrical and electronic panels including operator's panel should be provided with LED lamps for sufficient illumination and power receptacles of 220Volts, 5/15 Amp AC. All adapters/receptacles should have compatibility with Indian equivalents.	Bidder to Confirm
3.5	Motors shall conform to IEC or Indian Standards	Bidder to Confirm
3.6	All cables moving with traversing axes should be installed in caterpillar / Drag chain. Additionally, all the cable trays required for laying cables should be included in the offer.	Bidder to Confirm
3.7	Bidder should ensure proper earthing for the machine and its peripherals.	Bidder to Confirm
3.8	In-cycle hour counter with reset facility and also digital energy meter with RS485 communication facility shall be provided	Bidder to Confirm and provide details
4.0	SAFETY ARRANGEMENTS:	
4.1	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. Machine functions should be continuously monitored and alarm / warning indications through lights/ alarm number with messages (on CNC display and panels) should be available.	Bidder to Confirm
4.2	A detailed list of all alarms / indications provided on machine should be submitted by the supplier.	Bidder to specify
4.3	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.	Bidder to Confirm
4.4	All the rotating parts used on machine should be guarded and statically & dynamically balanced to avoid undue vibrations.	Bidder to Confirm
4.5	Emergency Switches at suitable locations as per International Norms should be provided.	Bidder to Confirm
4.6	Oil & water lines should not run with electrical cable in the same tray / trench.	Bidder to Confirm

ATP/production: R. R. R.

M/S. Quality

Modn/Paras

S No	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER With Technical Details
5.0	SERVO VOLTAGE STABILIZER:	
5.1	Indian make Oil / Air Cooled servo Controlled Voltage Stabilizer suitable for complete machine, its drives, controls, PLC etc with no undesirable Harmonics in the stabilizer output.	Bidder to specify
5.2	Make: NEEL / Servo max or Any other make acceptable to BHEL	Bidder to specify
5.3	Model & Rating (Suitable for the machine load. Bidder to specify noise level also.)	Bidder to specify
5.4	Spares Package for the Voltage Stabilizer for 2 years working should also be offered.	Bidder to Confirm
5.5	Catalogue of Voltage Stabilizer to be submitted.	Bidder to Submit
6.0	ULTRA ISOLATION TRANSFORMER	
6.1	Ultra Isolation Transformer (Indian make) suitable for complete machine, its drives, controls & PLC etc. shall be supplied.	Bidder to Confirm
6.2	Make: NEEL / Servo max or Any other make acceptable to BHEL	Bidder to specify
6.3	Model and Rating:	Bidder to specify
6.4	Spares Package for the Ultra Isolation Transformer for 2 years working should also be offered.	Bidder to Confirm
6.5	Catalogue of the Ultra Isolation Transformer to be submitted	Bidder to Submit
7.0	ENVIRONMENTAL PERFORMANCE OF THE MACHINE:	
7.1	Noise level shall not exceed 85 dB(A) at normal load condition, 1 meter away from the machine.	Bidder to Confirm
7.2	If any safety / environmental protection enclosure is required it should be built in the machine by the bidder.	Bidder to Confirm
7.3	Paint of the machine should be oil / coolant resistant and should not peel off and mix up with coolant.	Bidder to Confirm
8.0	CHIP CONVEYOR:	

R. R. [Signature]
ATP/production

[Signature]
MBS

[Signature]
Modn

S No	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER With Technical Details
8.1	A chip conveyor to convey short and curly chips to the chip bin. A Chip bin of appropriate size, with wheels and handle for movement, should also be supplied.	Bidder to confirm
8.2	Type of chip conveyor:	Bidder to specify
8.3	Width of conveyor	Bidder to specify
8.4	Elevation of chip conveyor for chip bin:	Bidder to specify
8.5	Material of chip conveyor	Bidder to specify
8.6	Provision for smooth flow of chips to the conveyor:	Bidder to specify
8.7	Operation of chip conveyor (forward & reverse) through push buttons on operator's panel should be possible.	Bidder to confirm
8.8	Layout showing location of chip conveyor should be submitted.	Bidder to submit
9.0	COMPRESSED AIR POINTS:	
9.1	Compressed air at around 4 to 5 bar will be made available at one point if required. Any pressure booster if required is in bidder scope. The bidder shall indicate the inlet point for compressed air in the layout drawing of the machine. Air drier unit shall be provided.	Bidder to Confirm
10.0	TOOLING:	
10.1	Facing tool holder on turret	3 Nos
10.2	Axial Tool Holder for square shank tool	2 Nos
10.3	Radial Tool Holder	1 No
10.4	Boring Tool Holder for dia 40 mm Boring Bar	3 Nos
10.5	Threading tool holder on turret (for external threading)	1 No
10.6	Threading tool holder on turret (for int. threading / boring bar)	1 No
10.7	Tool holder on turret (for holding 32 mm U drill)	1 No
10.8	Reduction sleeve 40 / 8	2 Nos
10.9	Reduction sleeve 40 / 10	2 Nos
10.10	Reduction sleeve 40 / 12	2 Nos
10.11	Reduction sleeve 40 / 16	2 Nos

ATP/production: R. Riff

MBS *Signature*

Man *Signature*
Page 10 of 18

S No	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
10.12	Reduction sleeve 40 / 20	2 Nos	
10.13	Reduction sleeve 40 / 25	2 Nos	
10.14	Reduction sleeve 40 / 32	2 Nos	
10.15	Reduction sleeve 40 / MT2, MT3, MT4	2 Nos each	
11.0	ACCESSORIES:		
11.1	List of standard accessories supplied along with the machine.	Bidder to furnish	
11.2	Additional Hard jaw for 3 Jaw self centering hydraulic chuck	2 sets	
11.3	Soft jaws for 3 Jaw self centering hydraulic chuck	12 sets	
11.4	Tail stock centers: Dead center and Revolving Center	2 Nos each	
11.5	Hydraulic 4 Jaw self-centering hollow chuck with hard Jaws to be supplied along with machine as a separate assembly	1 No	
11.6	Additional Hard jaw for 4 Jaw self-centering hydraulic chuck	2 sets	
11.7	Soft jaws for 4 Jaw self-centering hydraulic chuck	10 sets	
12.0	FAULT DIAGNOSTIC SYSTEM:		
12.1	Supplier's own diagnostic system with required hardware and software should be supplied and installed on the CNC system.	Bidder to confirm	
12.2	Help guide should be provided for fault diagnosis	Bidder to confirm	
13.0	LEVELING & ANCHORING SYSTEM:		
13.1	Complete anchoring system including foundation bolts, anchoring materials, fixators, leveling shoes etc should be supplied.	Bidder to confirm	
13.2	BHEL will do grouting/Anchoring as per the layout provided by the supplier.		
14.0	TOOLS FOR OPERATION & MAINTENANCE:		
14.1	Necessary tools like Torque Wrench, Spanners, Allen 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 Bidder to submit	
15.0	SPARES:		

R. R. S.
APP / production

[Signature]
MBS

[Signature]
Modn

S No	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER With Technical Details
15.1	The Bidder shall recommend and submit list of spares required for the machine for two years of trouble free operation on three shifts /day basis a) Mechanical & Hydraulic Spares: All types of pumps, All types of Valves, All types of pressure switches / transducers, All types of filters, All types of seals, Turret related Mechanical subsystems like gears, spline shafts and flanges. b) Electrical & Electronic Spares: All types of Relays, Contactors, Proximity Switches, Push Buttons, Indicating Lamps, Semiconductor Fuses, Special Fuses, Circuit Breakers, Main Power Switch, Encoders, Scanning Heads for Linear Scales(if offered), MMC module, NCU module, Operator's panel with Display Unit, I/O Cards for PLC, Servo Motors for Feed Drives, Power Module & Control Cards for Main Drive as well as Feed Drives etc. c) Un-priced list of spares with quantities, specified at a&b above, should be submitted with this technical offer. d) Unit Price of each item figuring in c shall be submitted with the price bid.	Bidder to Submit
15.2	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.	Bidder to confirm
16.0	MACHINE CONSTRUCTION:	
16.1	Bidder to furnish constructional details of the machine including explanatory drawings of various components/ assemblies like Head stock, carriage, Turret, Tailstock, Machine Bed, Feed Transmission System, Feed back System etc. of the machine with details of material & their hardness. The main spindle of the machine shall be hollow to allow long stems with large diameters to be fed inside.	Bidder to confirm

ATP/production: R. Raj

M/S. Srinivas

Madan Devan

S No	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER With Technical Details
16.2	Video images on CD / Hard copy of literature with photographs & drawings explaining the technical features shall be enclosed with the offer	Bidder to confirm
16.3	Sliding door shall be provided with sufficient transparent windows to view machining progress and to avoid Chip / coolant Splash.	Bidder to confirm
17.0	DOCUMENTATION	
17.1	Following listed documents (3 Hard copies and one softcopy in Pen drive) in English language should be supplied along with the machine	Bidder to confirm
17.2	Operating manuals of Machine & CNC system	Bidder to confirm
17.3	Programming Manuals of Machine & CNC system	Bidder to confirm
17.4	Detailed Maintenance manual of machine with all drawings of machine assemblies/sub-assemblies/parts including Electrical / Pneumatic/ Coolant / Hydraulic circuit diagrams.	Bidder to confirm
17.5	Maintenance, Interface & commissioning manuals for CNC system, spindle & feed drives.	Bidder to confirm
17.6	Manufacturing drawings for all supplied tool holders, coolant connections, adapters, sleeves, fixtures etc.	Bidder to confirm
17.7	Catalogues / O&M Manuals of all bought out items.	Bidder to confirm
17.8	Detailed specification of all rubber items and hydraulic/lube fittings	Bidder to confirm
17.9	Bearings: Make& Specification for all bearings used in the machine.	Bidder to Specify
17.10	Ball Screws: Detailed specification of all ball screws used in the machine shall be submitted. The specification shall address the following points: (a) Diameter, (b) Pitch, (c) Length, (d) Make (e) Model Also Mounting drawings of these ball screws to be provided.	Bidder to specify
17.11	Operating Manuals, Maintenance Manuals & Catalogues for Isolation Transformer and voltage stabilizer	Bidder to confirm
17.12	PLC program printouts (Ladder diagram / Statement list) with comments in English – if any	Bidder to confirm

ATP / R. R. P. / production

M/S *[Signature]*

[Signature]
Medn

S No	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER With Technical Details
17.13	PLC (if any) backup, NC backup in pen drive and CF card.	Bidder to confirm
17.14	Complete back up of hard disk (if any) on GHOST CD and clear written Instructions (1 copy) to take back up and reloading of a new hard disk- in case of PC based CNC system	Bidder to confirm
18.0	TRAINING	
18.1	The Bidder shall impart training to BHEL's Machine Operators and Maintenance crew in Operation and Maintenance during the commissioning of the Machine at BHEL works.	Bidder to confirm
18.2	Competent, English speaking experts shall be arranged by the bidder during training for satisfactory & effective training of BHEL personnel	Bidder to confirm
19.0	FOUNDATION	
19.1	Bidder shall submit complete foundation details including static and dynamic loads within one month after getting BHEL's purchase order. The layout should consist of all requirements pertaining to complete machine including space requirement for Voltage Stabilizer, Isolation Transformer, & any other accessories. BHEL shall construct complete foundation for the machine as per the Bidder's recommendation.	Bidder to confirm
19.2	The Bidder shall indicate detailed specifications of grouting compound and Grouting procedure etc. for foundation bolts of the machine.	Bidder to Specify
20.0	ERECTION & COMMISSIONING	
20.1	a) Supplier to take full responsibility for supervision of the erection. Start up, testing of machine, it's control system & all types of other supplied equipment like stabilizer & Transformer etc, machining of test pieces etc. are the responsibility of the supplier. b) Facilities like Power, air & water shall be provided by BHEL at only one point. c) Other requirement like crane for handling heavy items shall also be provided by BHEL, free of cost.	Bidder to confirm

ATP/production: *[Signature]*

MRS *[Signature]*

Moden *[Signature]*

S No	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER With Technical Details
20.2	Tools, Tackles, Test Mandrels, instruments and other necessary equipment including Laser equipment required to carry out all above activities should be brought by the supplier.	Bidder to confirm
20.3	The supplier shall arrange commissioning spares required for commissioning of the machine.	Bidder to confirm
20.4	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
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	ACCURACY TESTS	
22.1	GEOMETRICAL ACCURACIES	
22.1.1	Geometrical Accuracy Tests shall be in accordance with ISO 13041 standard or equivalent applicable standard.	Bidder to confirm
22.1.2	Head Stock Spindle run out (Radial & Axial):	Bidder to specify.
22.1.3	All other accuracies to confirm to ISO 13041 (Latest Revision) or Suppliers Test chart whichever is finer.	
22.1.4	Tail stock Quill taper run-out:	Bidder to specify.
22.1.5	Cylindricity of turning:	Bidder to specify.
22.1.6	True roundness of turning:	Bidder to specify.
22.1.7	Facial run-outs:	Bidder to specify.
22.1.8	All the above accuracies should be demonstrated to BHEL engineers during pre-acceptance at Suppliers works and during Erection & Commissioning at BHEL Works.	Bidder to confirm

R. Rast
ATP/production

[Signature]
Mbs

[Signature]
Modn

S No	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
22.2	MACHINE POSITIONING ACCURACIES & REPEATABILITY: Should be measured as per VDI/DGQ 3441 Or equivalent using necessary tools	Bidder to confirm	
22.2.1	Positioning accuracy in X axis (Pa) per 1000 mm:	± 0.010 mm	
22.2.2	Positioning accuracy in Z axis (Pa) per 1000 mm:	± 0.040 mm	
22.2.3	Repeatability in X axis (Ps): per 1000 mm	± 0.005 mm	
22.2.4	Repeatability in Z axis (Ps): per 1000 mm	± 0.020 mm	
23.0	AMBIENT CONDITIONS & THERMAL STABILITY		
23.1	Ambient Temperature: max 45 °C Relative Humidity : 85% Bidder to confirm that machine is suitable for above conditions	Bidder to confirm	
23.2	Weather conditions are tropical. Atmosphere may be dust laden during some part of the year. Machine will be installed in the normal shop floor condition. Bidder to confirm that machine is suitable for above	Bidder to confirm	
23.3	Thermal Stability of the machine shall be good enough to withstand the specified ambient conditions in order to meet the accuracy requirements of BHEL components. Bidder to confirm for trouble-free operation of the machine.	Bidder to confirm	
23.4	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	
24.0	MACHINE ACCEPTANCE: (Tests/Activities should be Performed by Bidder)		
24.1	Tests/Activities should be carried out at supplier's works on the machine before dispatch:		
24.1.1	Geometrical accuracies as per above mentioned standard by the supplier.	Bidder to confirm	
24.1.2	Machine positioning accuracies & repeatability should be measured as per above mentioned standard	Bidder to confirm	
24.1.3	Demonstration of all features of the machine, control system & accessories.	Bidder to confirm	

ASP/production: R. R. J.

M&S

Modan Devan

S No	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
24.1.4	Machining of test piece as per NAS/AFNOR/ISO. Bidder to supply sample test piece and tooling for it's machining.	Bidder to confirm	
24.2	Tests/Activities should be carried out at BHEL works while commissioning the machine:		
24.2.1	Geometrical accuracies as per above mentioned standard by the supplier.	Bidder to confirm	
24.2.2	Machine positioning accuracies & repeatability should be measured as per above mentioned standard	Bidder to confirm	
24.2.3	Full load test to demonstrate the maximum power & cutting capacity of the machine.	Bidder to confirm	
24.2.4	Demonstration of all features of the machine, control system & accessories.	Bidder to confirm	
24.2.5	Machining test piece as per NAS/AFNOR/ISO. Bidder to supply sample test piece and tooling for it's machining	Bidder to confirm	
24.2.6	Prove out of 2 or 3 jobs provided by BHEL. Toolings will be provided by BHEL for these job prove outs. Complete machining of prove out components shall be done by Vendor at BHEL works to the specified design accuracy and surface finish, using cutting tools and CNC programs to be provided by the vendor to prove the machine after complete erection. Material for the prove out components shall be provided by BHEL.	Bidder to confirm	
25.0	PACKING:		
25.1	Sea worthy & rigid packing for all items of complete machine, CNC System, 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.	Bidder to specify	
26.0	GUARANTEE:		
26.1	12 months from the date of acceptance of the machine at BHEL OR 18 months from dispatch, whichever is earlier	Bidder to confirm	
27.0	GENERAL		
27.1	Machine Make and Model:	Bidder to specify	
27.2	Total connected load (KVA):	Bidder to specify	

R. R. R.
ATP/production

[Signature]
MBS

[Signature]
Mod n

S No	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER With Technical Details
27.3	Floor area required (L x W x H) for complete machine & accessories:	Bidder to specify	
27.4	Painting of Machine / Electrical Panels: SYNTHETIC ENAMEL GLOSSY FINISH APPLE GREEN PAINT as per IS 5/1994. Shade (ISC) No: 281	Bidder to confirm	
27.5	Total weight of the machine:	Bidder to specify	
27.6	Weight of heaviest part of machine:	Bidder to specify	
27.7	Weight of the heaviest assembly / sub-assembly of the Machine:	Bidder to specify	
27.8	Dimensions of largest part/ sub-assembly/ assembly of the machine:	Bidder to specify	

R. R. P.
ATP/production

[Signature]
MKS

Modn *[Signature]*