

		<u>BHARAT HEAVY ELECTRICAL LIMITED</u>		
		<u>TOOL AND GAUGE DIVISION</u>		
				<u>Date: 31/05/2008</u>
<u>SPECIFICATION FOR</u>				
<u>SURFACE GRINDING MACHINE FOR GRINDING AND GAUGE SECTION</u>				
SCOPE: SUPPLY, ERECTION & COMMISSIONING OF SURFACE GRINDING MACHINE AS SPECIFIED BELOW				
SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	REMARKS	
1.0	PURPOSE & WORKPIECE MATERIAL			
1.1	Purpose: To do the surface grinding operation on Gauges, Steelings of press tools, slot-dies and other tooling components to maintain size , flatness and parallelism with high accuracy			
1.2	Work Piece Material: Grinding to be done on the following varities of materials in both soft and hard conditions 1) High carbon High chromium steel 2) High speed steel 3) Mild steel 4) Gauge steel			

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2.0	MACHINE SPECIFICATION:		
2.1	MACHINE CONFIGURATION: The proposed surface grinding machine shall be of following configuration: 1. It shall be single column machine, with fixed head-stock on the column. 2. The spindle should be horizontal and housed inside the head-stock and shall hold the grinding wheel 3. It should have a horizontal table with longitudinal slots for chuck/job holding 4. The table should move in the longitudinal directions on the horizontal plane for cutting and in cross direction for feed. 5. The table shall move in vertical direction with power rise and fall and hydraulically auto down feed.	Vendor to confirm	
2.1.1	Horizontal Spindle Orientation	Vendor to confirm	
2.2	TABLE :		
2.2.1	Size of Clamping Surface (LxB): 450mm X 150 mm	Vendor to confirm	
2.2.2	Max. Weight of Work-piece : 25 Kg.	Vendor to confirm	
2.3	SPINDLE:		
2.3.1	Spindle Diameter (Should be suitable for grinding wheel of bore dia) : 31.75mm	Vendor to confirm	
2.3.2	Spindle Motor Power : 0.75 KW or more	Vendor to confirm	
2.3.3	Spindle Motor Make, Model etc.(Should comply with IEC / IS specifications)	Vendor to specify	
2.3.4	Spindle Bearing Diameters (Radial & Axial)	Vendor to specify	
2.3.5	Maximum Spindle speed : 2800 RPM or more	Vendor to confirm	
2.3.6	Wheelhead should be grease packed for life	Vendor to confirm	
2.4	TRAVERSES:		
2.4.1	Maximum Longitudinal Travel : 460 mm or more	Vendor to confirm	
2.4.2	Maximum Cross travel : 165 mm or more	Vendor to confirm	

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2.4.3	Maximum Vertical Travel : 280 mm or more	Vendor to confirm	
	2.5 FEEDS AND DRIVE SYSTEM:		
2.5.1	Longitudinal table speed while grinding : Minimum-1.5 mpm Maximum- 18 mpm	Vendor to confirm	
2.5.2	Cross Feed per stroke at each reversal : Minimum - 0.175 mm Maximum - 1.75 mm	Vendor to confirm	
		Vendor to confirm	
2.5.3	Least count for Vertical feed (Depth of cut) : 0.002mm	Vendor to confirm	
2.5.4	Feed drive Motor Make, Model etc.(Should comply with IEC / IS specifications)	Vendor to confirm	
	2.6 DRO		
2.6.1	DRO for vertical and cross movements with 1 micron least count of Elektronica, Kirloskar, Sagor, Givimisure, Heidenhein or Sony make	Vendor to confirm	
	2.7 MACHINE LIGHTS:		
2.7.1	Machine Lights for sufficient illumination of complete working area should be provided for clear visibility.	Vendor to confirm	
	2.8 ELECTRICAL:		
2.8.1	415V + 10% / -10%, 50HZ +/-3 HZ, 3 Phase AC (3 wire system with out neutral) Power Supply Voltage 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 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 same could be incorporated during construction of foundation.	Vendor to confirm	
2.8.2	Motors shall conform to IEC or Indian Standards	Vendor to confirm	
2.8.3	Vendor should ensure the proper earthing for the machine and its peripherals.	Vendor to confirm	

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2.9	SAFETY ARRANGEMENTS:		
	Following safety features in addition to other standard safety features should be provided on the machine:	Vendor to confirm	
	1. Machine should have adequate and reliable safety interlocks / devices to avoid damage to the machine, workpiece and the operator due to the malfunctioning or mistakes.		
	2. All the rotating parts used on machine should be statically & dynamically balanced to avoid undue vibrations.		
	3. Emergency Switches at suitable locations as per International Norms are to be provided.		
2.10	ENVIRONMENTAL PERFORMANCE OF THE MACHINE :		
	The Machine shall conform to following factors related to environment :	Vendor to confirm	
	(a) Maximum noise level shall be 85 dB(A) at normal load condition, 1 M away from the machine with correction factor for back ground noise, if necessary. This will be measured as per international standards like DIN 45635-16. Supplier to demonstrate compliance to noise level, if so required.		
	(b) Paint of the machine should be oil resistant and should not peel off and mix up with oil.		
	(c) The dust suction system should be strong enough to leave very little dust in the atmosphere		
3.0	DUST EXHAUST EQUIPMENT		
	3.1 A complete system for dust extraction and collection to be provided	Vendor to confirm	
	3.2 The system should consist of atleast a collector nozzle, duct, collection box and suction pump	Vendor to specify	
	3.3 Consumables if any should be provided in sufficient quantity for atleast one year	Vendor to confirm	

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4.0	ACCESSORIES :		
4.1	Electromagnetic chuck with mag and demag switch for 450mm X 150mm table	Vendor to specify	
4.2	Wheel flanges 3 no.s	Vendor to specify	
4.3	Cross saddle lock	Vendor to specify	
4.4	Built in wheel truing attachment Head mounted including diamond	Vendor to specify	
4.5	Diamond holder and diamond for magnetic chuck	Vendor to specify	
4.6	Precision sine vice with jaw width 100 mm	Vendor to specify	
4.7	Recommended wear parts & spares for normal running of 2 years	Vendor to specify	
5.0	DOCUMENTATION :	Vendor to confirm	
	Four sets of following documents (Hard copies) in English language should be supplied along with the machine		
5.1	Operating manuals of Machine		
5.2	Detailed Maintenance manual of machine with all drawings of machine assemblies/sub-assemblies/parts including Electrical / Hydraulic circuit diagrams. All Assembly/ Sub Assembly Drawings shall be supplied with the part list also		
5.3	Maintenance, Interface & commissioning manuals for spindle & feed drives.		
5.4	Complete Master List of parts used in the machine shall be submitted by the vendor.		
6.0	FOUNDATION :		
6.1	Vendor shall submit the complete layout drawing to BHEL within one month after getting the LOI. The vendor shall also indicate detailed specifications of grouting compound and Grouting procedure etc. for foundation bolts of the machine.	Vendor to confirm	

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7.0	ERECTION & COMMISSIONING		
7.1	Supplier to take full responsibility for carrying out the erection, start up, testing of machine, it's control & all types of other supplied equipment, machining of test pieces etc. Service requirement like power, air & water shall be provided by BHEL at only one point to be indicated by supplier in their foundation/layout drawings. Other requirements like crane and helping personnel shall also be provided by BHEL. Details of these requirements should be informed by vendor in advance.	Vendor to confirm	
7.2	Tools, Tackels, Test Mandrels, instruments and other necessary equipment including Laser equipment required to carry out all above activities should be brought by the supplier. .	Vendor to confirm	
7.3	Commissioning spares, required for commissioning of the machine within stipulated time, shall be brought by the supplier on returnable basis.	Vendor to confirm	
7.4	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 vendor. For this purpose, the vendor should supply sufficient quantity of touch-up paint of various colours of paint used.	Vendor to confirm	
7.5	Schedule of Erection and Commissioning shall be submitted with the offer.	Vendor to confirm	
7.6	Charges, duration, terms & conditions for E&C should be furnished in detail separately by vendor along with offer.	Vendor to confirm	

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8.0	MACHINE ACCURACIES : Should be measured as per standard procedure		
8.1	Flatness over a job of size 400mm X 150mm : 0.005 mm	Vendor to confirm	
8.2	Parallelism over a job of size 400mm X 150mm: 0.005 mm	Vendor to confirm	
8.3	Angular accuracy with the supplied sine bar : +/- "15"	Vendor to confirm	
8.4	Surface finish: 0.2 Ra	Vendor to confirm	
9.0	MACHINE ACCEPTANCE: (Tests/Activities should be Performed by Vendor)	Should be accepted & confirmed by Vendor	
9.1	Tests/Activities should be carried out at BHEL works while commissioning the machine :		
9.1.1	Geometrical accuracies as per DIN 8609/ ISO 10791 test chart.		
9.1.2	Full load test to demonstrate the maximum power & cutting capacity of the machine.		
9.1.3	Demonstration of all features of the machine, control system & accessories to the satisfaction of BHEL for efficient and effective use of the machine		
9.1.4	Two weeks supervision of independent operation of machine by BHEL after Tests & demonstration mentioned at 9.1.1 to 9.1.3		

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9.1.5	Demonstration by actual use of all supplied attachments and accessories to their full capacity.			
9.1.6	Job testing on atleast 5 items +to establish all the accuracies as mentioned			
10.0	PACKING:			
10.1	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 despatched in containers, all small loose items shall be suitably packed in boxes		Vendor to confirm	
11.0	GUARANTEE :			
11.1	24 months from the date of acceptance of the machine.		Vendor to confirm	
12.0	GENERAL :			
12.1	Machine Model		Vendor to specify	
12.2	Total connected load (KVA):		Vendor to specify	
12.3	Floor area required (Length, Width, Height) for complete machine & accessories		Vendor to specify	
12.4	Painting of Machine / Electrical Panels : RAL 6011 Apple Green (Polyurethane Paint)		Vendor to confirm	
12.5	Total weight of the machine		Vendor to specify	
12.6	Vendor to submit, along with offer, reference list of customers where similar machines have been supplied mentioning broad specifications of the supplied machine i.e. Model, table size,		Vendor to furnish	
12.70	Detailed catalogues , sketch/ photographs of the m/c and accessories/ attachments should be submitted with the offer.		Vendor to furnish	

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13.0	REFERENCE LIST / QUALIFYING CONDITIONS :		
13.1	Only those vendors, who have supplied and commissioned at least one surface grinding machine of table size size 450x 150 mm or higher for similar applications in the past ten years and such machine is presently working satisfactorily with accuracies within 0.005 mm for more than one year (more than six months if supplied to BHEL) after commissioning should quote. The following information should be submitted by the vendor about the companies where similar machines have been supplied. This is required from all the vendors for qualification of their offer.	Vendor to confirm	
	1. Name of customer/company where similar machine is installed.		
	2. Complete postal address of the customer.		
	3. Year of commissioning.		
	4. Application for which the machine is supplied		
	5. Name and designation of the contact person of the customer.		
	6. Phone, FAX no.& email address of contact person of customer.		
	7. Performance certificate from the customers regarding satisfactory performance of machine supplied to them		