

	Transformer Plant, BHARAT HEAVY ELECTRICAL LIMITED, BHEL, JHANSI.	Machine No	MT-3/2/1529	Enquiry No. :	
		Quantity	1 No	Due Date :	
		Spec. No.	6161(A)	Supplier's Ref.:	
				Date :	
<u>SPECIFICATION CUM COMPLIANCE CERTIFICATION FOR</u> <u>MAGNETIC SURFACE GRINDING MACHINE</u>					
NOTE:-					
1. Vendor(OEM) must submit complete information against Clause No. 21.0. The offers meeting this clause would only be processed.					
2. The vendor should fill the "Offered" Column in compliance to specified requirements and also "Deviations" Column, where there is deviation from the requirement. Duly filled specification cum compliance certificate should be submitted along with the offer. Inadequate, incomplete, ambiguous or unsustainable information against any of the clauses of the specifications/requirements shall be treated as non-compliance..					
3. The offer and all documents enclosed with offer should be in English language only.					
ADDRESS OF THE SUPPLIER :					
TELEPHONE NOS.:					
FAX NOS.:					
E-MAIL ADDRESS :					
SCOPE: SUPPLY, ERECTION & COMMISSIONING OF MAGNETIC SURFACE GRINDING MACHINE AS SPECIFIED BELOW					
SL.NO	DESCRIPTION OF BHEL REQUIREMENT		OFFERED	DEVIATION	REMARKS
1.0	PURPOSE & WORK PIECE MATERIAL				
1.1	Purpose : The magnetic type grinding machine is required for finsh grinding of manganese/high carbon steel linear pads , shims	Vendor to Confirm			
1.2	Work Piece Material: manganese/high carbon steel linear pads , shims	Vendor to Confirm			
2.0	MACHINE SPECIFICATION				
2.1	MACHINE CONFIGURATION				
2.1.1	Spindle Orientation	Vertical			
2.1.2	Electromagnetic Table dia (Minimum)	750 mm			
2.1.4	Job Envelope with respect to machine table : (LengthxWidthxHeight) .Height of envelope should be 250 mm(min)	Vendor to specify			
2.1.5	Max Job weight	100 Kg (Min)			
2.1.7	Electromagnetic Table weight ;	Vendor to furnish details			
2.1.8	Electromagnetic Table Height ;	Vendor to furnish details			
2.1.9	Load carrying capacity of machine table	Vendor to furnish details			
2.1.10	table speed	Vendor to furnish			
2.2	SPINDLE:				
2.2.1	Spindle Motor Power (AC Continuous duty SI):	25 HP (Approx)			

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2.2.2	Spindle Motor Make, Model etc.(Should comply with IEC / IS specifications) should be reputed make	Vendor to confirm and specify			
2.2.7	Distance from Spindle Axis to Machine Table Top (Considering Job envelop and Wheel diameter)				
2.3	Grinding Wheel	Vendor to specify			
2.3.1	Grinding Wheel Type : Segment type	Vendor to confirm			
2.3.2	No . of segments	8			
2.3.3	segment material	Vendor to specify			
2.3.4	Segment wheel dia	450 min			
2.2.8	Min thickness of worn out Grinding Wheel	Vendor to specify			
2.2.9	Vendor has to submit grinding segment details and dimensional drawing				
2.4	Table				
2.4.1	Table details. Vendor has to offer feature that magnetic property remains in table for time it takes to stop from maximum speed in case of supply failure.	Vendor to confirm and provide details			
2.4.2	Table speed dual speed	Vendor to specify			
2.4.3	Table motor: Make and power details to be furnished	Vendor to specify			
2.5	CONSTRUCTION :				
2.5.1	Vendor to furnish material, hardness of guide ways & constructional details , including explanatory drawings, of various components/ assemblies like Gear Box, Guide ways/ slides, Bellow covers, Accessories, Table, feed transmission system, hydraulic and lubrication system etc. of the machine.	Vendor to provide details			
2.5.2	Video images on CD including hard copy explaining the technical features / Literature with photographs, drawings explaining the technical features should be enclosed with the offer	Vendor to provide details			
2.5.3	Safety / environmental protection enclosure shall be provided by the vendor. Opening of doors & roof should be such that front loading/unloading of the job with the help of crane is possible.	Vendor to Confirm			
2.6	OPERATION AND CONTROL SYSTEM:				
2.6.1	OPERATOR'S PANEL:				
2.6.1	Details to be submitted by supplier	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. A magnetic base portable spot light with sufficiently long cable should also be provided.	Vendor to confirm			
2.7.2	Any lights required in the foundation/ pit area shall also be foreseen and supplied by the vendor.	Vendor to confirm			

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2.7.3	All light fittings, consumables, adapters/receptacles should have compatibility with Indian equivalents	Vendor to confirm			
2.8	CLAMPING SYSTEM :	Vendor to Confirm			
2.8.1	Supplier has to submit details of system for clamping of spindle head.	Vendor to Confirm			
2.9	COOLANT SYSTEM :				
2.9.1	Coolant System with all accessories shall be provided for the following	Vendor to Confirm			
2.9.2	a) Recirculating Type Flood Coolant System through adjustable trajectory multiple nozzles b) Internal coolant is also required	Vendor to Confirm and submit details			
2.9.3	Coolant collection and recirculation system should be leak proof & perfect to avoid any spillage on shop floor, trenches for cables & foundation pit of the machine etc.	Vendor to Confirm			
2.9.4	Coolant Filtration System: Recirculating type coolant system with Filtration System and magnetic separator.	Vendor to Confirm			
2.9.5	Coolant Flow Diagram showing filters, pumps, valves, tanks etc.to be submitted with the offer.	Vendor to Confirm			
2.9.6	Pressure & rate of flow of coolant should be furnished in the offer. The Pressure should be sufficient for the coolant to reach the contact surface (Grinding wheel & Job)	Vendor to confirm and provide details			
2.9.7	Coolant Tank Capacity	Vendor to provide details			
2.9.8	Coolant pump and motor details.	Vendor to provide details			
2.9.9	The coolant tank should be fitted with skimmer for regular cleaning of coolant from contamination with tramp oil.	Vendor to Confirm			
2.9.10	First filling of the Coolant for the machine to be supplied by vendor. Indigenous (Indian) source or Indian equivalent and specifications is also to be provided by the vendor. The vendor shall also submit estimated annual consumption of the coolant on 7000 hours per year working basis.	Vendor to confirm			
3.00	ELECTRICAL:				
3.1	415V + 10% / -15%, 50HZ +/-3 HZ, 3 Phase AC (4 wire system with 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/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 same could be incorporated during construction of foundation.	Vendor to Confirm			

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3.2	Tropicalisation:				
3.2.1	All electrical / electronic equipment shall be tropicalized to work in mentioned operating condition.	Vendor to Confirm			
3.2.2	All electrical & electronic control cabinets & panels should be dust and vermin proof.	Vendor to Confirm			
3.2.3	All electrical components in the cabinets should be mounted on DIN Rail.	Vendor to Confirm			
3.2.4	All electrical / electronic panels to be provided with adequate door locks. All electrical & electronic panels including operator's panel should have sufficient illumination and power receptacles/plug points of 220Volts, 5/15 Amp AC with on/off switch. All electrical adapters/receptacles, fittings, consumables etc. should be compatible with Indian equivalents.	Vendor to Confirm			
3.2.5	All motors shall conform to IEC standard.				
3.2.6	All cables moving with traversing axes should be installed in caterpillar / Drag chain. Additionally, all the cable trays required for laying of cables should be included in the offer.	Vendor to Confirm			
3.2.7	Vendor should ensure the proper earthing for the machine and its peripherals /accessories. Any material requirement for the same should be informed with foundation design/drawings. The vendor can take earthing connection from the nearest available location of the production shop.	Vendor to Confirm			
4.0	SAFETY ARRANGEMENTS:				
4.1	Following safety features in addition to other standard safety features should be provided on the machine:	Vendor to Confirm			
4.1.1	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			
4.1.2	A detailed list of all alarms / indications provided on machine should be submitted by the supplier.	Vendor to Confirm			
4.1.3	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 for effective use of machine.	Vendor to Confirm			
4.1.4	All the rotating parts used on machine should be statically & dynamically balanced to avoid undue vibrations.	Vendor to Confirm			
4.1.5	Emergency Switches at suitable locations as per International Norms are to be provided.	Vendor to Confirm			
4.1.6	Oil & water pipe lines should not run with electrical cable in the same tray / trench.	Vendor to Confirm			

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4.2	ENVIRONMENTAL PERFORMANCE OF THE MACHINE :				
	The Machine shall conform to following factors related to environment :				
4.2.1	Safety / Environmental protection enclosure should be built in the machine by the vendor. The Shop environment shall be free from dressing dust.	Vendor to Confirm			
4.2.2	There shall not be any emissions from the machine. All fumes etc during machining shall be arrested by fume extraction system.	Vendor to Confirm			
4.2.3	Maximum noise level shall be 85 dB (A) at 1 meter 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 asked for during commissioning and necessary measurement equipment will be arranged by BHEL.	Vendor to Confirm			
4.2.4	There should not be any effluent from the machine. In case there are any effluents from the machine, requisite effluent treatment plant or pollution control device should be built into the machine by the supplier. Suitable dust collection system should be provided with spare consumables if any.	Vendor to Confirm			
4.2.5	No hazardous chemicals shall be used in the machine.	Vendor to Confirm			
4.2.6	Paint of the machine should be oil / coolant resistant and should not peel off and mix up with coolant.	Vendor to Confirm			
4.2.7	M/C shall be leak proof with suitable collection tray for Lube Oil	Vendor to Confirm			
4.2.8	Machine should be built in line with international safety and environmental protection standard. A copy of confirmation certificate shall be given during pre-dispatch inspection.	Vendor to Confirm			
5.0	LEVELING & ANCHORING SYSTEM				
5.1	Complete set of anchoring materials including foundation bolts, nuts, washers, fixators, leveling shoes etc for alignment and fixing of the machine on the floor should be supplied. Details to be submitted.	Vendor to Confirm			
6.0	TOOLS FOR ERECTION, OPERATION & MAINTENANCE :				
6.1	Special tools and equipment required for erection and 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. Also Tools for change of Grinding wheels to be offered.	Vendor to Confirm			

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6.2	Test mandrel for checking run-out/taper & alignment should be supplied if required.	Vendor to Confirm			
7.0	ACCESSORIES: Other than basic part and accessories of machine like electromagnetic chuck, table guard, wheel dressing unit and segmental chuck following has to be offered-				
7.1	Diamond Dresser 1.ct - 1 no	Vendor to quote & provide details			
7.2	Grinding Wheel (5 sets)	Vendor to quote & provide details			
7.3	Mag Demag Unit - 1 set	Vendor to quote & provide details			
8.0	SPARES:				
8.1	Itemized breakup of Mechanical, Hydraulic and Electrical used on the machine in sufficient quantity as per recommendation of Vendor for 2 years of trouble free operation on three shifts continuous running basis should be offered by vendor. The list to include the following, in addition to other recommended spares:	Vendor to Confirm			
	a) Mechanical & Hydraulic Spares: All types of Pumps, Valves, Pressure Switches, Transducers, Flow Switches, Filters, Seals, O-rings, Hydraulic Hoses etc., belts if used	Vendor to Confirm			
	b) Electrical /Electronic / CNC 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, MMC module, NCU module, Operator's panel with Display Unit, Floppy Disk Unit, I/O Cards for PLC, Servo Motors for Feed Drives, Power Module & Control Cards for Main Drive as well as Feed Drives etc.	Vendor to confirm			
8.2	All types of Spares for total machine and accessories should be available for at least ten years after supply of the machine. If machine or control is likely to become obsolete in this period, the vendor should inform BHEL sufficiently in advance and provide drawings of parts / details of spares & suppliers to enable BHEL to procure them in advance, if required	Vendor to Confirm			
8.3	Vendor to confirm that complete list of spares for machine and accessories, along with specification / type / model, and name & address of the spare supplier shall be furnished along with documentation to be supplied with the machine	Vendor to Confirm			
8.4	Electromagnetic table as per clause 2.1.2.	Vendor to Confirm			
9.0	COMPRESSED AIR POINTS:				

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9.1	Compressed Air Point with manual ON/ OFF Valve and flexible pipe of suitable length for work piece cleaning.	Vendor to confirm			
10.0	DOCUMENTATION : Five sets of following documents (Hard copies) in English language should be supplied along with the machine	Vendor to confirm			
10.1	Programming Manuals of Machine				
10.2	Detailed Maintenance manual of machine with all drawings of machine assemblies/sub-assemblies/parts including Electrical / Pneumatic/ Coolant / Hydraulic circuit diagrams. All Assembly/ Sub Assembly Drawings shall be supplied with the part list also. Hydraulic Circuit drg. on anodized sheet shall be fixed on the machine.				
10.3	Manufacturing drawings for all supplied tool holders, coolant connections, adapters, sleeves, fixtures etc.				
10.4	Catalogues, O&M Manuals of all bought out items including drawings, wherever applicable.				
10.5	Detailed specification of all rubber items and hydraulic/lube fittings				
10.6	Complete Master List of parts used in the machine shall be submitted by the vendor.				
10.7	Hydraulic Circuit diagram on anodized sheet shall be fixed on the M/C				
11.00	FOUNDATION				
11.1	Vendor to confirm that floor details submitted along with tender enquiry is fit to install the machine. Vendor shall submit the preliminary layout drawing for getting BHEL's approval within one month from the date of Purchase Order. In case additional foundation is required, complete foundation design including details viz. static / dynamic load details etc. and final layout drawings shall be submitted by the supplier within three months after getting BHEL's approval for Preliminary layout Drgs. The layout should consist of all requirements pertaining to complete machine including space requirement for Voltage Stabilizer, Isolation Transformer, Compressor Air dryer, Chip Bin & all other accessories/offered items. BHEL shall construct complete foundation for the machine under supervision of supplier and at supplier's responsibility. Vendor should arrange equipments required for the testing of foundation, if required by the vendor. The vendor shall also indicate detailed specifications of grouting compound and grouting procedure etc. for foundation bolts of the machine	Vendor to Confirm			
12.0	TRAINING	Vendor to confirm			

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12.1	Training of BHEL Engineers in the following field for the following period shall be provided : (a) Electrical, Electronic & other supplied equipments - 1 Week (b) Mechanical & Hydraulic maintenance of the machine & other supplied equipments - 1 Week (c) Operation of the machine & other supplied equipment - 1 Week	Vendor to confirm			
12.2	The training shall be imparted at the time of Machine Pre-acceptance tests at vendor's works and suitable nos. of competent, English speaking experts for each area shall be pre-arranged by vendor to cover complete training as well as pre-acceptance during the stipulated period.	Vendor to confirm			
12.3	Air-fare, boarding & lodging for the trainees shall be borne by BHEL.	Vendor to confirm			
13.0	ERECTION & COMMISSIONING				
13.1	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 (Capacity of 10 ton only) and helping personnel shall also be provided by BHEL. Details of these requirements should be informed by vendor in advance. In case crane of higher capacity is required, representative of vendor to hire mobile crane from local sources.	Vendor to Confirm			
13.2	Erection & Commissioning of all accessories with all electrical & mechanical connections shall also be responsibility of the vendor.	Vendor to Confirm			
13.3	Successful proving of BHEL components by the supplier shall be considered as part of commissioning. All tests, as mentioned at Sl. No. 17.0 shall also be part of the commissioning activity.	Vendor to Confirm			
13.4	Tools, Tackels, Test Mandrels, instruments and other necessary equipment (including Laser equipment, if required) required to carry out all erection & commissioning activities should be arranged and brought by the supplier.	Vendor to Confirm			
13.5	Commissioning spares, required for commissioning of the machine within stipulated time, shall be brought by the supplier on returnable basis.	Vendor to Confirm			

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13.6	Broad Schedule of Erection and Commissioning shall be submitted within one month of order.	Required			
13.7	Charges, duration, terms & conditions for Erection & Commissioning should be furnished in detail separately by vendor along with offer.	Vendor to Confirm			
13.8	Portion, if any, of the machine, accessories and other supplied items where paint got rubbed or peeled off during transit or erection should be repainted and matched with the original adjoining paint by the vendor. For this purpose, the vendor should supply sufficient quantity of touch-up paint of various colours/shades of paints used. The vendor shall ensure performing touching after commissioning but before final acceptance.	Vendor to Confirm			
14.0	ACCURACY TESTS:				
14.1	GEOMETRICAL ACCURACIES :				
14.1.1	Geometrical Accuracy Tests shall be in accordance with relevant test chart submitted with the offer	Vendor to Confirm			
14.2	MACHINE POSITIONAL ACCURACIES & REPEATABILITY:				
14.2.1	Vendor to submit positioning accuracies	Vendor to Specify			
15.0	AMBIENT CONDITIONS & THERMAL STABILITY :				
15.1	Total machine including all supplied items should work trouble free and efficiently under following operating conditions and should give specified accuracies. Power Supply (AC): Voltage = 415 V +10% / -15% Frequency = 50 Hz +3% / -3% No. of phases = 3 (3 wire system without neutral) Ambient Conditions: Temperature up to 30 degree Celsius in Air Conditioned Hall Relative Humidity About 70%	Vendor to Confirm			
16.0	MACHINE ACCEPTANCE:				
16.1	Following Tests/Activities should be carried out at Suppliers works before dispatch :				
16.1.1	Geometrical accuracies as per test chart	Vendor to Confirm			
16.1.2	Positioning accuracies	Vendor to Confirm			
16.1.3	The machine should be tested for continuous running of 48 hrs. If any break down occurs during this test, the test should be repeated for 48 hrs from that time.	Vendor to Confirm			
16.1.4	Demonstration of all features of the machine accessories.	Vendor to Confirm			
16.1.5	Machining of test piece . Vendor to supply test piece	Vendor			

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16.2	Following Tests/Activities should be carried out at BHEL works while commissioning the machine :				
16.2.1	Geometrical accuracies as per test chart	Vendor to Confirm			
16.2.2	Machining of test piece . Vendor to supply test piece	Vendor			
16.2.3	Full load test to demonstrate the maximum power & Grinding capacity of the machine.	Vendor to Confirm			
16.2.4	The machine should be tested for continuous running of 48 hrs. If any break down occurs during this test, the test should be repeated for 48 hrs from that time.	Vendor to Confirm			
16.2.5	Demonstration of all features of the machine accessories to the satisfaction of BHEL for efficient and effective use of the machine.	Vendor to Confirm			
16.2.6	Training of BHEL machine operators in operation of complete machine & accessories etc by the supplier's experts / engineers during their stay at BHEL works	Vendor to Confirm			
16.2.7	Demonstration by actual use of all accessories to their full capacity.	Vendor to Confirm			
17.0	PACKING:				
17.1	Adequate 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			
18.0	GUARANTEE :				
18.1	24 months from the date of acceptance of the machine.	Vendor to Confirm			
19	COLOR OF THE MACHINE	Vendor to confirm			
19.1	Painting of Machine including accessories like electrical panels, chip conveyor, coolant system, work piece handling system etc. shall be : RAL 6011 Apple Green (Polyurethane Paint)	vendor to confirm			
20.0	GENERAL INFORMATION				
	Following information shall be supplied with the offer:				
20.1	Machine Model	Vendor to Confirm			
20.2	Total connected load (KVA):	Vendor to Confirm			
20.3	Floor area required (Length, Width, Height) for complete machine & accessories	Vendor to Confirm			
20.4	Total weight of the machine	Vendor to Confirm			
20.5	Weight of heaviest part of machine	Vendor to provide details			
20.6	Weight of the heaviest assembly / sub-assembly of the Machine	Vendor to provide details			
20.7	Dimensions of largest part/ sub-assembly/ assembly of the machine	Vendor to provide details			

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20.8	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, Spindle power, Load Capacity etc	Vendor to Confirm			
20.9	Detailed catalogues , sketch/ photographs of the m/c and accessories/ attachments should be submitted with the offer.	Vendor to Confirm			
21.0	QUALIFYING CONDITIONS :				
21.1	Only those vendors, who have supplied and commissioned at least two Surface Grinding Machine of same (As per clause no 2.1.2) or higher sizes for precision applications in the past ten years (On the Date of Opening of tender) and such machine is presently working satisfactorily for more than one year after commissioning (On the Date of Opening of tender) 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 the customer / company where similar machine is installed.				
	2. Complete postal address of the customer.				
	3. Month and year of commissioning.				
	4. Application for which the machine is supplied				
	5. Name and designation of the contact person of the customer.				
	5. Name and designation of the contact person of the customer.				
	6. Phone, FAX no. and email address of the contact person of the customer.				
	7. Performance certificate from the customers regarding satisfactory performance of machine supplied to them				
	8. 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.				
Arjun Singh			Md. Arshad		
Mgr. (WE&S)			Mgr. (LMM)		
S.J.Chakraborty			K.D.Manjhi		
Sr. DGM (WTFT)			DGM (LMM & LMP)		