

	<u>BHARAT HEAVY ELECTRICAL LIMITED</u>				Enquiry No. :
	<u>UNIT'S ADDRESS:</u>				Due Date :
	<u>UNIT'S PHONE NO.:</u>				Supplier Qtn. No.:
	<u>CONTACT PERSON'S NAME/DESGN./PHONE NO./E-MAIL (FROM PURCHASE DEPT.)</u>				Date :
<u>SPECIFICATION CUM COMPLIANCE CERTIFICATION FOR</u>					
<u>PORTABLE SHAPER MACHINE</u>					
	NOTE:-				
	<p>1. The "Offered" Column and where applicable, the "Deviations" & "Remarks" Column of this format shall be filled in by the Vendor and 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.</p>				
	<p>2. The offer and all documents enclosed with offer should be in English language only .</p>				
ADDRESS OF THE SUPPLIER :			ADDRESS OF THE INDIAN AGENTS :		
TELEPHONE NOS.:			TELEPHONE NOS.:		
FAX NOS.:			FAX NOS.:		
E-MAIL ADDRESS :			E-MAIL ADDRESS :		
SCOPE: SUPPLY, INSTALLATION & COMMISSIONING OF PORTABLE SHAPER MACHINE AS SPECIFIED BELOW					

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
1.0	PURPOSE & WORKPIECE MATERIAL				
1.1	Purpose: The Portable Type Shaper is required for machining of the blade insertion grooves in Steam Turbine Rotors.				
1.2	Work Piece Material: Material alloy steel (UTS < 980 N/mm ² , 0.2 Proof Stress)				
2.0	MACHINE SPECIFICATION				
2.1	MACHINE CONFIGURATION				
2.1.1	Length of the stroke	500 mm Max.			
2.1.2	Vertical travel of the Tool post slide (Manual feed)	150 mm or more			
2.1.3	No. of speeds to Ram	Vendor to specify			
2.1.4	No. of Ram cycles /min.	20 to 200 strokes /min.			
2.1.5	A.C.Motor Power	10.0 HP or more			
2.2	CONSTRUCTION:				
2.2.1	The Shaper should have a customized Tool post as per BHEL Drg. No. R6729-0002.	Vendor to confirm			
2.2.2	The Machine should be mounted on a slide (bed on which machine will travel) which will be clamped to the shop floor bed plates during operation. The movement of the machine will be along the length of the rotor the slides through a feed gear box with a 3 H.P. motor .Provision for automatic movement and clamping to be provided.	Vendor to confirm			
2.2.3	Separate lever for minor adjustments in the ram stroke length shall be provided.	Vendor to confirm			
2.2.4	Machine structure should be rigid so that vibrations do not occur during machining of blade insertion grooves.	Vendor to confirm			

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2.2.5	Machine slide (bed on which machine will travel) should be of single piece castiron block with hardened and ground guideways.	Vendor to confirm			
2.2.6	Independent auto lubrication system for Ram slide and its mechanism and Manual lubrication for other parts to be provided.	Vendor to confirm			
2.2.7	There should not be any leakage / spillage of oil during operation or otherwise.	Vendor to confirm			
2.2.8	Hardened steel strip on guide ways of ram movement and turcite will be provided on shaper body guide to reduce wear and tear.All moving guide ways,as well as their matching moving parts,shall be of hardened and ground steel.	Vendor to confirm			
2.2.9	Proper lifting arrangement shall be provided for shifting of machine from one place to another place.	Vendor to confirm			
2.2.10	Operator's platform shall be provided on both sides of machine.	Vendor to confirm			
2.2.11	Machine light shall be provided.	Vendor to confirm			
2.2.12	Standard tool kit for operation and maintenance of the machine shall be provided	Vendor to confirm			
3.00	ELECTRICAL:				
3.1	415V(fluctuation + 10% / -10%), 50HZ(fluctuation +/-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/control cabinets, shall be the resposibility 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	Motors shall conform to IEC or Indian Standards	Vendor to confirm			
3.3	Vendor should ensure the proper earthing for the machine and its peripherals.	Vendor to confirm			
4.00	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.				
	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.				
	4. All the rotating parts used on machine should be statically & dynamically balanced to avoid undue vibrations.				
	5. Emergency Switches at suitable locations as per International Norms are to be provided.				

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5.00	ENVIRONMENTAL PERFORMANCE OF THE MACHINE :	Vendor to confirm			
	The Machine shall conform to following factors related to environment :				
	(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.				
	(d) No hazardous chemicals shall be required to be used in the machine.				
	(e) If any safety / environmental protection enclosure is required it should be built in the machine by the vendor.				
	(f) Paint of the machine should be oil / coolant resistant and should not peel off and mix up with coolant.				
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	Vendor to furnish			

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7.0	SPARES: (OPTIONAL)	Vendor to furnish			
	Lubrication Pump with its piping -01 set of each type.				
	All oil seals -01 set.				
	Lead screw with nut for ram movement -01 set.				
	Lead screw with nut for tool head slide -01 set.				
	Motor -01 no.				
	Power Contactor -02 nos. of each type.				
	Relays -02 nos. of each type.				
	Overload relays -02 nos. of each type.				
	Single phase preventer -02 nos.				
	Push buttons - 05 nos. of each type.				
	Push Buttons Contacts (NO) - 20 nos.				
	Push Buttons Contacts (NC) - 20 nos.				
8.0	DOCUMENTATION : 5 sets of operation / maintenance manuals, (hard copies in English language) containing electrical circuit diagram detailed assembly drawings of each sub assembly with part list shall be provided.	Vendor to confirm			
9.0	OPERATING CONDITIONS :				
9.1	Total machine including CNC system and all supplied items should work trouble free and efficiently under following operating conditions and should give specified accuracies. Power Supply: Voltage: 415 V - 10%, +10% 50 Hz +3%, - 3% No. of phases = 3 Ambient Conditions: Temperature = 5 to 45 degree celsius Relative Humidity = 95% max. (Vendor to confirm that machine is suitable for above and details of provisions on the machine for the same are to be furnished by Vendor)	Vendor to confirm			

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9.2	Weather conditions are tropical, Atmosphere may be dust laden during some part of the year. Machine shall be kept in the normal shop floor condition. Max. temperature variation is up to 25 deg Celsius in 24 hours. (Vendor to confirm that machine is suitable for above and details of provisions on the machine for the same are to be furnished by Vendor)	Vendor to confirm			
10.0	INSTALLATION and COMMISSIONING: Party shall take full responsibility for carrying out start up and testing of the machine. Successful proving of components (complete machining of blade insertion grooves in one rotor) shall be considered as part of commissioning. During commissioning, accuracies as per component drawing are to be achieved.	Vendor to confirm			
11.0	MACHINE ACCEPTANCE: (Tests/Activities should be Performed by Vendor)	Should be accepted & confirmed by Vendor			
11.1	Provisional acceptance of the machine will be made by BHEL's representative at supplier's works prior to dispatch. Specification compliance and performance of the machine on a test piece shall be checked.				
11.2	Final acceptance shall be made by BHEL at its plant following successful commissioning and achieving specified accuracy.				
11.3	Test certificate shall be furnished along with the machine.				
12.0	GUARANTEE :				
12.1	24 months from the date of acceptance of the machine.	Vendor to confirm			
13.0	GENERAL :				
13.1	Machine Model	Vendor to specify			
13.2	Total connected load (KVA):	Vendor to specify			

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13.3	Painting of Machine / Electrical Panels : RAL 6011 Apple Green (Polyurethane Paint)	Vendor to confirm			
13.4	Total weight of the machine	Vendor to specify			