

SPECIFICATION CUM COMPLIANCE CERTIFICATE FOR PORTABLE UNIVERSAL RADIAL DRILLING MACHINE

	<u>BHARAT HEAVY ELECTRICAL LIMITED</u> <u>UNIT'S ADDRESS:</u> <u>UNIT'S PHONE NOS.</u> <u>CONTACT PERSON'S NAME/DESIGN./PHONE</u> <u>NO./E-MAIL (FROM PURCHASE DEP'T.)</u>	Enquiry No. : _____ Due Date : _____ Supplier Qtn. No.: _____ Date : _____			
NOTE:- 1. Vendor must submit complete information against clause no. 19.0 The offer meeting this clause would only be processed. 2. 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 :		ADDRESS OF THE INDIAN AGENTS :			
TELEPHONE NOS.:		TELEPHONE NOS.:			
FAX NOS.:		FAX NOS.:			
E-MAIL ADDRESS :		E-MAIL ADDRESS :			
SCOPE: SUPPLY, ERECTION & COMMISSIONING OF PORTABLE UNIVERSAL RADIAL DRILLING MACHINE WITH SPECIFICATION AS BELOW					
SI. NO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED BY/TO BE CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
1.0	PURPOSE & WORK PIECE MATERIAL				
1.1	Purpose: (Operations/Jobs involved)	Drilling, Reaming & Tapping during assembly at different locations			

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1.2	Work Piece Material: (Material detail, Hardness etc.)	Alloy Steels/Medium carbon steel			
2.0	SPECIFICATION:				
2.1	CAPACITY & SIZE				
2.1.1	Drilling Capacity in Steel with Tensile Strength of 60 Kgs / sq.mm	¢ 50 mm			
2.1.2	Drilling Capacity in Cast Iron with Tensile Strength of 25 Kgs./sq mm	¢ 65 mm			
2.1.3	Tapping Capacity in Steel	M48			
2.1.4	Tapping Capacity in Grey castiron	Vendor			
2.1.5	Drilling depth	5 Times Drill Size			
2.2	DRILL HEAD				
2.2.1	Spindle Taper	MT5			
2.2.2	Spindle Travel minimum	340mm			
2.2.3	Number of spindle speeds	Vendor			
2.2.4	Spindle speed range	16-800 rpm			
2.2.5	Number of power feed	Vendor			
2.2.6	Feed Range	0.05 to 0.5mm/rev			
2.2.7	Maximum torque on spindle	Vendor			
2.2.8	Spindle diameter	Vendor			
2.3	WORKING RANGE				
2.3.1	Horizontal travel of arm minimum	850mm			
2.3.2	Split type bellow covers for up and down arm traverse for protection of column sleeve	Required			
2.3.3	Vertical travel of arm minimum	1250 mm			
2.3.4	Column traverse along bed minimum	1200mm			
2.3.5	Angle of drill head rotation	360°			
2.3.6	Angle of arm rotation	360°			
2.3.7	Angle of drill head swivel from horizontal upward and downwards	90°			

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2.3.8	distance of spindle axis from column surface with spindle in vertical position--max/min	2070/1220 mm			
2.3.9	drilling radius with spindle in vertical position--max/min	2270/1420 mm			
2.3.10	distance between spindle face and floor level(with spindle retracted and in vertical position)	1555/305 mm			
2.3.11	distance between drilling spindle axis in horizontal position and floor level--max/min	2725/295 mm			
2.3.12	Feeds	Vendor			
2.3.13	Speed of the arm elevation	Vendor			
2.3.14	Power Rating/ RPM of Motor for Drilling Spindle (Minimum)	3.7KW/1500 RPM			
2.3.15	Elevating Motor	Vendor			
2.3.16	Automatic lubrication systems for all traverse movements shall be provided	Vendor			
2.3.17	Mechanical end stoppers for column and arm movements shall be provided.	Vendor			
2.4	BASE				
2.4.1	Base Size	Vendor			
2.4.2	Number, width, and spacing of slots for clamping on bed	Vendor			
3.0	CONSTRUCTION:				
3.1	Vendor to furnish details of material, hardness & constructional details, including explanatory drawings, of various components/assemblies like Column, Arm, Spindle head, Guide ways/slides, Feed Transmission system, Spindle, Hydraulic and Lubrication system etc .of the machine.	Vendor			
3.20	Machine shall be provided with suitable lifting arrangment for transportation from place to place within the shop floor.	Vendor			
4.0	OPERATOR'S PANEL:				
4.1	Swiveling type operator's panel having complete machine control systems.	Vendor			
5.0	MACHINE LIGHTS:				
5.1	Machine Lights for sufficient illumination of complete working area should be provided for clear visibility.	Vendor			

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5.2	All light fittings, consumables, adapters/receptacles should have compatibility with Indian equivalents	Vendor			
6.0	GEOMETRICAL ACCURACIES :				
6.1	Geometrical Accuracy Tests shall be in accordance with ISO 2423 / DIN 8625 standard or equivalent applicable standard. Detailed Test Charts for the same, clearly showing the accuracies to be achieved on the machine, shall also be Submitted with the offer.	Vendor			
6.2	All the above accuracies should be demonstrated to BHEL engineers during pre-acceptance at Suppliers works and during Erection & Commissioning at BHEL Works.	Vendor			
7.0	AMBIENT CONDITIONS & THERMAL STABILITY :				
7.1	Total machine should work trouble free and efficiently under following operating conditions, Power Supply : Voltage: 415 V +10% / -15% Volts Frequency: 50 Hz $\pm$ 3% No. of phases = 3 Ambient Conditions: Temperature = 5 to 45 degree celsius Relative Humidity = 95% max. (Confirm that machine is suitable for above and details of provisions on the machine for the same should be furnished)	Vendor			
7.2	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.	Vendor			
7.3	Thermal Stability of the complete machine keeping in view specified Ambient Conditions and accuracy requirements of BHEL components and trouble free operation of the machine should be ensured by vendor. (Confirm that machine is suitable for above and details of provisions on the machine for the same should be furnished)	Vendor			

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7.4	The machine including attachments & accessories should be suitable for 24 hrs. continuous operation to its full capacity for 24 hour a day and 7 days a week throughout. Vendor to ensure and confirm the same.	Vendor			
8.0	ELECTRICAL :				
8.1	415V + 10% / -15%, 50HZ +/-3%, 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 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			
8.2	Tropicaization: All electrical equipment shall be tropicalized	Vendor			
8.3	All electrical control cabinets & panels should be dust and vermin proof	Vendor			
8.4	All electrical components in the cabinets should be mounted on DIN Rail	Vendor			
8.5	Electrical panel / 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			
8.6	Motors shall conform to IEC or Indian Standards	Vendor			
8.7	All cables moving with traversing axes should be installed in caterpillar / Drag chain.	Vendor			
8.8	Power Cable of 10mtr. length may be included in the supply alongwith the machine with proper securing arrangement during the idle time.	Vendor			

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8.9	Vendor should ensure the proper earthing for the machine and its peripherals.	Required			
9.0	SAFETY ARRANGEMENTS:	Vendor			
9.1	Following safety features in addition to other standard safety features should be provided on the machine:				
	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. .				
	2. 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.				
	3.. All the rotating parts used on machine should be statically & dynamically balanced to avoid undue vibrations.				
	4. Emergency Switches at suitable locations as per Indian Standards should be provided.				
10.0	ENVIRONMENTAL PERFORMANCE OF THE MACHINE :	Vendor			
	The Machine shall conform to following factors related to environment :				
	(a) Maximum noise level shall be 85 dB(A) at normal load condition, 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 so required.				

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	(b) There shall not be any emissions from the machine except fumes of cutting fluid during machining.				
	(c) If any safety / environmental protection enclosure is required it should be built in the machine by the vendor.				
	(d) Paint of the machine should be oil / coolant resistant and should not peel off and mix up with coolant.				
11.0	SPARES:	Vendor			
11.1	Itemized breakup of mechanical, electrical spares 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 recommended spares like gears for speed and feeds, shifting mechanism including electric solenoid coils for change over / selection of arm movement and swivel of spindle head etc. (Unit price of each item of spare should be offered)	Vendor			
11.2	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 and suppliers to enable BHEL to procure them in advance if required.	Vendor			
11.3	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			
12.0	DOCUMENTATION : Five sets of following documents (Hard copies) <u>in English</u> language should be supplied along with the machine	Vendor			

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12.1	Operating manuals of Machine				
12.2	Detailed Maintenance manual of machine with all drawings of machine assemblies/sub-assemblies/parts, automatic lubrication system, including Electrical circuit diagrams. All Assembly / Sub Assembly Drawings shall be supplied with part list also.				
12.3	Catalogues, O&M Manuals of all bought out items including drawings, wherever applicable.				
12.4	One additional set of all the above documentation on CD ROM, wherever possible.				
12.5	Detailed specification of all rubber items.				
12.60	Complete Master list of parts used in the machine shall be submitted by the vendor.				
13.0	PROVE OUT OF BHEL COMPONENTS :	Vendor			
13.1	Machine to be proved for its capability of Maximum drilling and tapping on test piece. Material for the proveout shall be provided by BHEL.	Vendor			
13.2	During prove out, final job inspection shall be done by supplied Job Measuring tools. Vendor shall be responsible for any deviation/rejection in prove out component due to wrong machining or malfunctioning of the machine during prove out machining and also for the delay in machining due to improper recommended tooling etc. The cost of such deviations / rejection, if any, shall be refunded by the vendor to BHEL.				
14.0	ERECTION & COMMISSIONING				
14.1	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. 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			

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14.2	Successful proving of BHEL components by the supplier shall be considered as part of commissioning. All tests, as mentioned at clause 15 (Machine Acceptance) shall form part of the commissioning activity.	Vendor			
14.3	Commissioning spares, required for commissioning of the machine within stipulated time, shall be brought by the supplier on returnable basis.	Vendor			
14.4	Schedule of Erection and Commissioning shall be submitted with the offer.	Vendor			
14.5	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 used.	Vendor			
14.6	Schedule, Charges, duration, terms & conditions for E&C should be furnished in detail separately by vendor along with offer.	Vendor			
15.0	MACHINE ACCEPTANCE: (Tests/Activities should be Performed by Vendor)	Vendor			
15.1	Tests/Activities should be carried out at supplier's works on the machine before dispatch :	Vendor			
15.1.1	Geometrical accuracies as per test chart.	Vendor			
15.1.2	The machine should be tested for continuous running of 24 hrs. If any break down occurs during this test, the test should be repeated for 24hrs from that time.	Vendor			
15.1.3	Demonstration of all features of the machine, control system & accessories	Vendor			
15.1.4	Machining of test piece as per Standard Vendor to supply test piece	Vendor			
15.2	Tests/Activities should be carried out at BHEL works while commissioning the machine :	Vendor			
15.2.1	Geometrical accuracies as per test chart.				
15.2.2	The machine should 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			

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15.2.3	Full load test to demonstrate the maximum power & cutting capacity of the machine.				
15.2.4	Demonstration of all features of the machine & accessories to the satisfaction of BHEL for efficient and effective use of the machine				
15.2.5	Prove out machining.				
15.2.6	Two weeks supervision of independent operation of machine by BHEL after job prove out				
15.2.7	Training of BHEL machine operators in operation of complete machine & accessories etc by the supplier's experts / engineers during their stay at BHEL works				
15.2.8	Demonstration by actual use of all supplied attachments and accessories to their full capacity.				
16.0	PACKING:				
16.1	Sea worthy & rigid packing for all items of complete machine, all accessories and other supplied items to avoid any damage/loss in transit.	Vendor			
16.2	When machine is dispatched in containers all small loose items shall be suitably packed in boxes.	Vendor			
17.0	GUARANTEE :	Vendor			
17.1	24 months from the date of acceptance of the machine.	Vendor			
18.0	GENERAL :	Vendor			
18.1	Machine Model	Vendor			
18.2	Total connected load (KVA):	Vendor			

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18.3	Floor area required (Length, Width, Height) for complete machine & accessories	Vendor			
18.4	Painting of Machine / Electrical Panels : RAL 6011 Apple Green (Polyurethane Paint)	Vendor			
18.5	Total weight of the machine	Vendor			
18.6	Weight of heaviest part of machine	Vendor			
18.7	Weight of the heaviest assembly and Sub-assembly of the Machine	Vendor			
18.8	Dimensions of largest part of the machine	Vendor			
18.9	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, Drilling Capacity etc.	Required			
19.0	REFERENCE LIST / QUALIFYING CONDITIONS :	Vendor			
	Only those vendors, who have supplied and commissioned atleast one Portable universal Radial Drilling Machine of same (Drilling Capacity, Drilling Depth, Spindle Drive, Motor Rating & Travel etc.) or higher sizes for similar applications in the past ten years (On the Date of Opening of tender) and such machine is working satisfactorily for more than one year, after commissioning (On the Date of Opening of tender) should quote. However, if such machine(s) has/had been supplied to BHEL, then such machine should be presently working satisfactorily for more than six months after its commissioning and acceptance (On the Date of Opening of tender) in BHEL, 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			
	1. Name of the customer / company where similar machine is installed.				
	2. Complete postal address of the customer.				
	3. Month & Year of commissioning.				
	4. Application for which the machine is supplied with details of accuracies achieved on the job.				

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	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.				