

SS4

	<u>BHARAT HEAVY ELECTRICALS LIMITED</u>		Enquiry No. :
	<u>UNIT'S ADDRESS</u>		Due Date :
	<u>UNIT'S PHONE NOS.</u>		Supplier Qtn. No.:
	<u>CONTACT PERSON'S NAME/DESIGN./PHONE NO./</u>		Date :
<u>E-MAIL (FROM PURCHASE DEPTT.)</u>			

SPECIFICATION CUM COMPLIANCE CERTIFICATION FOR
UNIVERSAL PORTABLE RADIAL DRILLING MACHINE(CAP-Ø 50) FOR WTM DIVISION

	NOTE :-
	1. Vendor must submit complete information against clause no. 17.0 The offer meeting this clause would only be processed.
	2. 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.
	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 DRILLING MACHINE COMPLYING WITH SPECIFICATION AS GIVEN BELOW:					
S. NO.	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
1	<u>Introduction :</u> The universal portable drilling machine is required for drilling and tapping on various Hydro Turbine Components.	Vendor to note			
2	<u>Purpose:</u> Drilling upto 50 mm capacity, Tapping upto M48x5P. Other operations to be done are spotfacing, counter boring, back spot facing etc. .	Vendor to confirm			
3	<u>Specification:</u>	Vendor to confirm			
3.1	<u>Drilling Capacity & Accuracy:</u> Dia 50 mm(Minimum) in Steel and Dia 65 mm in Cast Iron with <u>Drilling Accuracy</u> : ± 0.1 mm, proving to be done in maximum three steps.	Vendor to confirm			
3.2	<u>Reaming Accuracy:</u> Reaming of dia 50mm with reaming accuracy within +0.03mm.	Vendor to confirm			
3.3	Threading capacity - M48x5P in steel	Vendor to confirm			
3.4	Spindle axis travel - 340 mm (Min)	Vendor to confirm			
3.5	Number of spindle speed - 15	Vendor to confirm			
3.6	Spindle taper - MT5	Vendor to confirm			
3.7	Speed range - 16-800 RPM	Vendor to confirm			

S. NO.	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
3.8	Spindle feed range - 0.05(Max) mm to 0.5 mm(Min) per rev (6 feeds)	Vendor to confirm			
3.9	Min and max distance between spindle axis and column surface - (1220 - 2070) mm	Vendor to confirm			
3.10	Vertical travel of arm (min) - 1250 mm	Vendor to confirm			
3.11	Horizontal travel of arm (min) - 850mm	Vendor to confirm			
3.12	Column travel along bed (min) - 1200 mm	Vendor to confirm			
3.13	Bed size (min) - 2610 mm x 1050 mm	Vendor to confirm			
3.14	Spindle head tilting (90 deg up/ 90 deg down) - 180 deg.	Vendor to confirm			
3.15	Spindle head rotation. - 360 deg.	Vendor to confirm			
3.16	Arm rotation - 360 deg	Vendor to confirm			
3.17	Column diameter (min) - 400 Diameter	Vendor to confirm			
3.18	Drilling Spindle motor rating	Vendor to specify			
3.19	Machine weight < 8 Ton	Vendor to confirm			
3.20	Provision of Lifting hook	Vendor to confirm			
3.21	Standard Test Chart as per Annexure-1 for inspection of Geometrical accuracy, Positional accuracy and Drilling accuracy of machine required for pre-despatch inspection and commissioning/proving of machine. QAP is attached as per Annexure-2. Same is to be used for PDI & Commissioning of machine.	Vendor to confirm			

S. NO.	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
4.0	<u>Technical Details:</u>				
4.1	Various controls for speed and feed changing levers hand wheels for hand traverses should be included and machine should be complete in all respects.	Vendor to confirm			
4.2	Remote control of all machine function including elevating, traversing, tilting and sleeve locking operation by pendant panel.	Vendor to confirm			
4.3	Remote control of fine adjustment of spindle head in vertical, horizontal and oblique direction.	Vendor to confirm			
4.4	Saddle centralised lubrication.	Vendor to confirm			
4.5	Remote controlled clamping for column.	Vendor to confirm			
4.6	Automatic clamping of Arm on Column & Head on Arm.	Vendor to confirm			
4.7	Provision of Spindle Speed selection	Vendor to confirm			
4.8	Spindle max torque protection.	Vendor to confirm			
4.9	Protection against overload for spindle speeds.	Vendor to confirm			
4.10	Slipping protection on machine traversing on bed, arm vertical traversing on bed, arm vertical traversing and arm hor. traversing.	Vendor to confirm			
4.11	Switch board with low voltage control, equipped with push button to control the different movements and emergency push button.	Vendor to confirm			

S. NO.	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
4.12	Spindle feed to be protected by a safety device.	Vendor to confirm			
4.13	All gears for spindle control as hardened and ground.	Vendor to confirm			
4.14	Depth drilling with positive stop	Vendor to confirm			
4.15	Rapid traverse of arm in hor. Direction.	Vendor to confirm			
4.16	Rapid traverse of arm in ver. Direction.	Vendor to confirm			
4.17	Rapid traverse of column on the bed.	Vendor to confirm			
5.0	<u>Scope of Supply:</u>				
5.1	Complete machine with main drilling head, column, arm, base slide, clamping pads, switches board with low voltage control etc.	Vendor to confirm			
5.2	4 sets of manuals.	Vendor to confirm			
5.3	One set of service wrenches.	Vendor to confirm			
5.4	Saddle centralised lubrication.	Vendor to confirm			
5.5	Essential spare parts for 3 years trouble free working.. Itemised list of spares are to be offered (with unit price of each spare) The spares will be ordered as per requirement. Note: The price of the spares will not be considered for the evaluation of the machine cost (L1 criteria).	Vendor to confirm			
5.6	Electro-hydraulic/mechanical clamping device for column only.	Vendor to confirm/specify			

S. NO.	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
6.0	<u>Predeparch Inspection (at supplier's works):</u>				
6.1	The pre-deparch inspection shall be carried out for Geometrical accuracy, Positional accuracy and Drilling accuracy/Drilling capacity and work manship of the machine as per Specification Clause No.-3.21. All the toolings, test piece/s required for proveout of machine to be arranged by supplier.	Vendor to confirm			
6.2	<u>Load Test:</u> Two nos. of 50 dia holes(1 hole in perpendicular direction and 1 hole in 45 deg position of spindle) to be drilled directly with the feed of 0.313mm/rev on 100mm thick MS plate.	Vendor to confirm			
6.3	<u>Accuracy Test:</u> 6 Nos. of holes (3 holes in perpendicular direction and 3 holes in 45 deg position of spindle) to be drilled on 100mm thick MS plate at an accuracy of ± 0.1 mm in drilling and $+0.03$ mm in reaming operation.(Ref- Specification Clause 3.1 & 3.2)	Vendor to confirm			
6.4	All the drilling operations are to be performed by skilled operator arranged by the supplier.	Vendor to confirm			
7.0	<u>Packing:</u>				
	Damage proof & sea worthy.	Vendor to confirm			

S. NO.	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
8.0	<u>Erection, Commissioning and Proving(at BHEL's Works):</u>				
8.1	Proving to be done on test piece 100 mm thick supplied by BHEL-Bhopal with Min. 20 nos. holes of Dia 50 (± 0.1) and Tapping of 20 nos. M48 internal threads. All the toolings required for proveout of machine to be arranged by supplier. (Ref Specification Clause No.-3.21.)	Vendor to confirm			
8.2	Load Test : Two nos. of 50 dia holes(1 hole in perpendicular direction and 1 hole in 45 deg position of spindle) to be drilled directly with the feed of 0.313mm/rev on 100mm thick MS plate.	Vendor to confirm			
8.3	Accuracy Test: 20 nos. of holes to be drilled on 100mm thick MS plate in 3 steps as following at an angle of 45 degree from vertical axis with an accuracy of ± 0.1 mm as mentioned in Specification Clause 3.1. i). Dia 22 mm, RPM 150, Feed- 0.3 ii). Dia 42 mm, RPM 50, Feed- 0.3 iii). Dia 50 mm , RPM 50, Feed- 0.3	Vendor to confirm			
8.4	Accuracy to be checked with reaming of 20 nos. holes(10 holes in perpendicular direction and 10 holes in 45 deg position of spindle) on 100 mm thick MS plate and the final results should be within ± 0.03 mm. (Ref Specification Clause 3.2.)	<i>Vendor to confirm</i>			
8.5	All the drilling operations are to be performed by skilled operator arranged by the supplier.	Vendor to confirm			

S. NO.	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
9.0	<u>Electrical :</u>				
	Electric supply available is 415 VAC +/- 10%, 50 HZ +/- 3%, 3 wire 3 phase no neutral for any requirement of 220 volts other voltages, suitable transformer should be in built.	Vendor to confirm			
10.0	<u>Safety:</u>				
	All relevant safety feature to be included.	Vendor to confirm			
11.0	<u>Guarantee :</u>				
	12 months from date of commisioning and 18 month from date of dispatch which ever is later.	Vendor to confirm			
12.0	<u>Lubrication :</u>				
	Suitable lubrication arrangements to be put on for easy and smooth running of machine.	Vendor to confirm			
13.0	<u>Machine Lamp:</u>				
	A machine lamp of rating Min 100 Watt is to be incorporated.	Vendor to confirm			
14.0	<u>Ambient conditions:</u>				
	Machine Should be suitable for ambient condition as given below.				
	Max RH -95%, Max. Temp-50 deg. C, Min. Temp- 4 deg. C.	Vendor to confirm			

S. NO.	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
15.0	Documentation: 4 sets of operations and maintenance manuals. Blow out spare parts diagram with parts number identification are required.	Vendor to confirm			
16.0	Spares: 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 these in advance, if required 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. Itemised list of spares are to be offered (with unit price of each spare) The spares will be ordered as per requirement. Note: The price of the spares will not be considered for the evaluation of the machine cost (L1 criteria).	Vendor to confirm			
17.0	REFERENCE LIST / QUALIFYING CONDITIONS : Only those vendors, who have supplied and commissioned at least two drilling machine of same or higher capacity and accuracy as mentioned in clause 3.1 to 3.4 for similar applications in the past ten years (on the date of opening of this tender) and such machine is working satisfactorily for more than one year after commissioning and acceptance, should quote. The following information must be submitted along with the offer by the vendor about the companies/customer where similar machines have been supplied. This is required from all the vendors for qualification of their offer.	Vendor to confirm			

S. NO.	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
	1. Name of the customer / company where similar machine is supplied.	Vendor to furnish details			
	2. Complete postal address of the customer.	Vendor to furnish details			
	3. Month & Year of commissioning.	Vendor to furnish details			
	4. Details of m/c supplied & application for which the machine is supplied . (Unpriced PO copy to be enclosed)	Vendor to submit documents			
	5. Name and designation of the contact person of the customer.	Vendor to furnish details			
	6. Phone, FAX no. and email address of the contact person of the customer.	Vendor to furnish details			
	7. Recent Performance Certificate in original from the customer regarding satisfactory performance of machine for minimum one year after commissioning. The performance certificate should be issued within 1 year of tender opening date.	Vendor to submit documents			
	8. In case of supplier's agent the vendor should provide valid Authorisation Certificate from OEM.	Vendor to submit documents			
	9. BHEL reserves the right to verify information submitted by vendor. In case the information is found to be false/incorrect, the offer shall be rejected.	Vendor to confirm			

ANNEXURE-2 : QUALITY ASSURANCE PLAN(QAP)

FOR UNIVERSAL PORTABLE RADIAL DRILLING MACHINE(CAP-Ø 50)

S. NO.	DESCRIPTION	SPECIFIED / CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
1.0	Standard Test Chart as per Annexure-1 for inspection of Geometrical accuracy, Positional accuracy and Drilling accuracy of machine required for pre-despatch inspection and commissioning/proving of machine. Same is to be used for PDI & Commissioning of machine. (Ref. Specification CL 3.21)	Vendor to confirm			
2.0	<u>Predeparch Inspection (at supplier's works):</u>				
2.1	Ther pre-deparch inspection shall be carried out for Geometrical accuracy, Positional accuracy and Drilling accuracy/Drilling capacity and work manship of the machine as per Specification Clause No.-3.21 & 6.0 All the toolings, test piece/s required for proveout of machine to be arranged by supplier.	Vendor to confirm			
2.2	<u>Load Test:</u> Two nos. of 50 dia holes(1 hole in perpendicular direction and 1 hole in 45 deg position of spindle) to be drilled directly with the feed of 0.313mm/rev on 100mm thick MS plate. (Specification Clause No.- 6.0)	Vendor to confirm			
2.3	<u>Accuracy Test:</u> 6 Nos. of holes (3 holes in perpendicular direction and 3 holes in 45 deg position of spindle) to be drilled on 100mm thick MS plate at an accuracy of ± 0.1 mm in drilling and +0.03mm in reaming operation.(Ref-Specification Clause 3.1 & 3.2 & 6.0)	Vendor to confirm			
2.4	All the drilling operations are to be performed by skilled operator arranged by the supplier. (Specification Clause No.- 6.0)	Vendor to confirm			

3.0	<u>Erection, Commissioning and Proving(at BHEL's Works):</u>				
3.1	Proving to be done on test piece 100 mm thick supplied by BHEL-Bhopal with Min. 20 nos. holes of Dia 50 (± 0.1) and Tapping of 20 nos. M48 internal threads. All the toolings required for proveout of machine to be arranged by supplier. (Ref Specification Clause No.-3.21. & 8.0)	Vendor to confirm			
3.2	<u>Load Test :</u> Two nos. of 50 dia holes(1 hole in perpendicular direction and 1 hole in 45 deg position of spindle) to be drilled directly with the feed of 0.313mm/rev on 100mm thick MS plate. (Ref Specification Clause 8.0)	Vendor to confirm			
3.3	<u>Accuracy Test:</u> 20 nos. of holes to be drilled on 100mm thick MS plate in 3 steps as following at an angle of 45 degree from vertical axis with an accuracy of ± 0.1 mm as mentioned in Specification Clause 3.1 & 8.0 i). Dia 22 mm, RPM 150, Feed- 0.3 ii). Dia 42 mm, RPM 50, Feed- 0.3 iii). Dia 50 mm , RPM 50, Feed- 0.3	Vendor to confirm			
3.4	Accuracy to be checked with reaming of 20 nos. holes(10 holes in perpendicular direction and 10 holes in 45 deg position of spindle) on 100 mm thick MS plate and the final results should be within +0.03mm. (Ref Specification Clause 3.2. & 8.0)	Vendor to confirm			
3.5	All the drilling operations are to be performed by skilled operator arranged by the supplier. (Ref Specification Clause No.- 8.0)	Vendor to confirm			

1

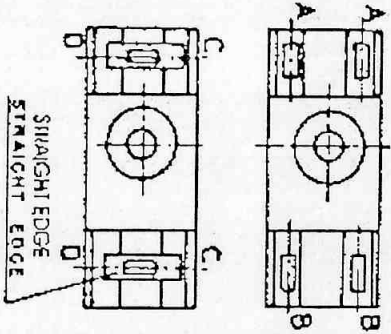
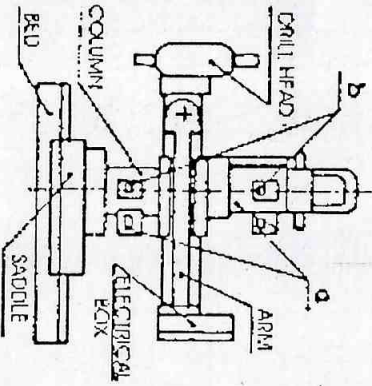
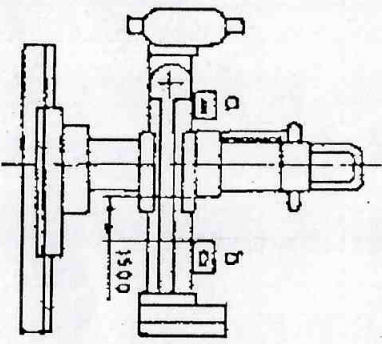
MACHINE SR. NO. : _____

MACHINE TYPE : _____

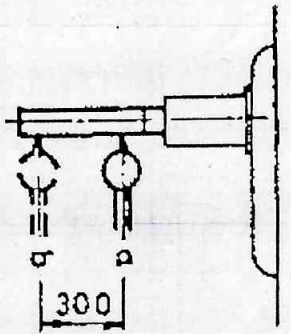
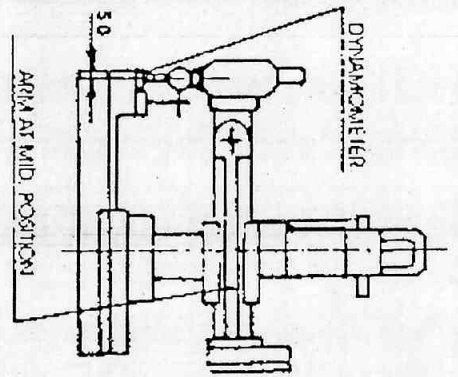
DATE : _____

TEST CERTIFICATE FOR
PORTABLE UNIVERSAL RADIAL
DRILLING MACHINE

CUSTOMER

SR. NO.	NATURE OF TEST	FIGURE	PERMISSIBLE DEVIATIONS	ACTUAL ERROR
1	Straightness of bed guideways in vertical plane. c) In longitudinal direction at AB b) In transverse direction, CD		a) 0.075 mm/m b) 0.05 mm/m	
2	Column squareness with bed. a) In plane along guideways of bed b) In plane perpendicular to guideways of bed.		a) 0.2 mm/m b) 0.2 mm/m	
3	Arms guideways parallel to bed		a) 0.25 mm/m b) 0.25 mm/m	

For Test Nos. 1, 2 and 3 column at middle of bed, Arm parallel to bed and at middle point of column in vertical and horizontal plane.

3				
S.R. NO.	NATURE OF TEST	FIGURE	PERMISSIBLE DEVIATIONS	ACTUAL ERROR
4	True running of taper in spindle		a) 0.02 mm b) 0.03 mm	
5	Deflection of arm due to thrust load.		4 mm under load of 100 kg.	
NOTE : Whenever shifted, the machine should be secured in horizontal plane within on + accuracy of ± 0.1 mm/1000 mm as per Test No. 1				
INSPECTOR			INCHARGE Q. C.	