

	BHARAT HEAVY ELECTRICAL LIMITED		Enquiry No. :	
	UNIT'S ADDRESS:		Due Date :	
	CONTACT PERSON'S NAME/DESIGN./PHONE NO./E-MAIL (FROM PURCHASE DEPTT.)		Supplier Qtn. No.:	
			Date :	
SPECIFICATION CUM COMPLIANCE CERTIFICATE OF RADIAL DRILL MACHINE				
REF : TEX/100MM RADIAL DRILL MACHINE/2021/02				
<u>ANNEXURE -1</u>				
	NOTE:-			
	1. Vendor (OEM) must submit complete information against clause no. 7 (Qualifying condition). The offer meeting this clause would only be processed (OEM : Original Equipment Manufacturer).			
	2. The vendor(OEM) 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.			
NAME & ADDRESS OF THE SUPPLIER :				
TELEPHONE NOS.:				
FAX NOS.:				
E-MAIL ADDRESS :				
SCOPE: SUPPLY, ERECTION & COMMISSIONING OF RADIAL DRILL MACHINE COMPLYING WITH SPECIFICATIONS AS BELOW:				
SL. NO	DESCRIPTION OF BHEL REQUIREMENT	REQUIRED	Deviation	REMARKS
1.0	PURPOSE :			
1.1	Drilling upto 100 mm capacity, Tapping upto M80x4P. Other operations to be done are spotfacing, counter boring, back spot facing etc. .	Vendor to confirm		

1.2	The machine shall consist of a vertical column mounted on the base plate. The horizontal arm moves up and down the column and can be locked at any position. Also the arm shall be manually swiveled about the column center and lock at any position. The drilling Head moves horizontally on the horizontal arm and can be locked at any position. The spindle is housed in the drilling head and can be moved up and down	Vendor to confirm		
1.2	JOB DESCRIPTION AND TECHNICAL REQUIREMENT OF JOB :			
1.2.1	Job Description : Alloy Steel, Stainless steel AISI 304 /405, Mild steel, Copper, Brass, Gun Metal. Material Hardness :350 BHN or slightly higher . Component Drawing (i) Base frame m/c (ii) Pole end plate m/c (iii) Stator frame and slip ring (iv) Stator frame m/c as ANNEXURE-2	Vendor to confirm		
2	SPECIFICATIONS:- (Minimum Requirement)			
2.1	TECHNICAL			
2.1.1	Drilling in steel (50kg/mm ²): 6.75 mm - 100 mm (minimum range)	Vendor to confirm		
2.1.2	Drilling in cast iron (BHN 180): Min.115 mm	Vendor to confirm		
2.1.3	Tapping in steel-Metric fine thread :M 8X1.25 - M 80X4 (minimum range)	Vendor to confirm		
2.1.5	Centre of spindle to centre of column min. : 800 mm	Vendor to Specify		
2.1.6	Maximum vertical distance between spindle nose to base of the machine : 2700 mm	Vendor to Specify		
2.1.7	Maximum drilling thrust	Vendor to specify		
2.1.8	Maximum torque on spindle	Vendor to specify		

2.1.9	Powered locking of drilling head on arm :	Vendor to specify the mode and details		
2.1.10	Minimum vertical distance between Spindle nose to base of the machine : Not more than 1000 mm	Vendor to confirm		
2.1.11	Maximum distance from the axis of the spindle to the guide ways on the Machine Column : 4000 mm	Vendor to specify		
2.1.12	Minimum distance from the axis of the spindle to the guide ways of column : Not more than 600 mm	Vendor to specify		
2.1.13	Drill head traverse along the Radial Arm : Around 3400 mm	Vendor to specify		
2.1.14	Vertical Travel of arm on the column : Minimum 1600 mm	Vendor to confirm		
2.1.15	Powered clamping mechanism of arm on the machine column. (With indicator) :	Vendor to specify		
2.1.16	Spindle Storke 450 mm	Vendor to confirm		
2.1.17	Spindle speed range-16-1000 , minimum 10 steps	Vendor to Specify		
2.1.18	No of feeds no less than 10 steps, Range 0.056-2.5 , minimum 10 steps	Vendor to Specify		
2.1.19	Swivel of Arm +/- 180 Deg	Vendor to Specify		
2.2	BASE PLATE			
2.2.1	Machine Bed 1 : Minimum 5000 mm X 1500 mm X 250(H) mm	Vendor to confirm		
2.2.2	Machine Bed 2 : Minimum 4500 mm X 3500 mm X 250(H) mm at ground level	Vendor to confirm		

2.2.3	Machine Bed 3 : Minimum 5000 mm X 4500 mm X 250(H) mm , at 1500 below the ground level	Vendor to confirm		
2.2.4	Schemantic Layout of Beds as per Drawing RadialDrill Bed/2021/01.	Vendor to confirm		
2.2.5	T'slot dimension : 28 mm widthx 250 mm pitch. T slot Dim of Floor Plates : 36 mm widthx 315 mm pitch	Vendor to Specify		
2.2.6	Vendor to submit Base plate detail Drawing	Vendor to confirm		
2.2.7	Uniformly Distributed Load Carrying Capacity to be verified by load/ stress analysis. - 10 Ton / m2	Vendor to confirm		
2.2.8	Cast iron bed plates shall conform to IS:10602-1983/2005 (Edition 1.1). It shall be made from plain grey iron castings conforming to grade FG:200 of IS:210-1993. Min. hardness 200HB. Material test certificates as required by the Indian Standard shall be submitted along with the supply.	Vendor to confirm		
2.2.9	Accuracy (surface flatness) of bed plate As per Din 876/ Class 1.	Vendor to confirm		
2.2.10	Proper railing of minimum 2000 mm height is to be provided for the Bed area that below the ground on all 3 sides to prevent any accidents.	Vendor to confirm		
2.3	POWER			
2.3.1	Power main motor : min . 15 kw	Vendor to Specify		
2.3.2	Power & speed rating of Electric Motors for a) Spindle b) Arm Elevation c) Drill Head Traverse on Arm, d) Column Travel and e) Coolant Pump is to be furnished	Vendor to provide details		
2.3.3	Power arm motor : min 5 kw	Vendor to Specify		
2.3.4	Hydraulic pump motor :min 2 kw	Vendor to Specify		

2.4	ACCURACY			
2.4.1	H 12(\pm 0.4mm Max) by 100 mm Drill & finish be upto 6.4 Or better.	Vendor to confirm		
2.4.2	NOGO gauge not passed in Thread make of Solid tap of M80X4 as per IS 6175	Vendor to confirm		
2.4.3	Reamed Hole finish shall 1.6 micron or better .(Any Hole below 100 mm)	Vendor to confirm		
3	CONSTRUCTION AND SPECIAL FEATURE			
3.1	Machine Constrcution and Features			
3.1.1	Machine column construction shall have External column sleeve mounted on inner column .Machine arm assembled with Column sleeve and the Arm shall move up,down and radially	Vendor to confirm		
3.1.2	All casting shall be stress relieved sufficiently rigid to meet requirement of test chart as per IS 2199 standard.	Vendor to confirm		
3.1.3	Spindle shall be precisionhardened and ground -hardness range 55-60 HRC.	Vendor to confirm		
3.1.4	Vendor to furnish details of material, hardness & constructional details, including explanatory drawings, of various components/assemblies like Column, Bed, Arm, Drilling Head, Spindle, etc. of the machine.	Vendor to provide details		
3.1.5	Machine configuration shall be such that drilling head; arm, column and base shall be sturdy enough to withstand all types of reactionary forces developed during drilling with drilling head at farther most point on the radial arm.	Vendor to confirm		
3.1.6	Diameter of Revolving sleeve(external)column :Min 550 mm	Vendor to specify		

3.1.7	All gears shall be hardened and ground (supplier shall furnish the test report of item, is brought then submit all the relevant document during PDI)	Vendor to confirm		
3.1.8	Method of spindle stopping and braking .	Vendor to specify		
3.1.9	Column of Machine (Internal fix column & external Revolving sleeve shall properly integrated with thrust Bearing).Vendor shall furnish the detail construction,drawing etc.of Column.All the bearing shall be of reputed make.Vendor to specify the bearing make.	Vendor to confirm		
3.1.10	Column shall be centred by a Radial Ball bearing or a roller Bearing at the Top and a special Roller bearing at the bottom.Thus the arm ,which is mounted on the sleeve shall swing easily to a light touch of finger.Vendor shall furnish the details,drawing etc of column	Vendor to specify		
3.1.11	Column material shall be CI.GR.FG 260/ GCI GR 30, as per IS210 and weight of column alone shall be Min.1900 kg.Wall thickness should be uniform in casting.	Vendor to confirm		
3.1.12	Arm elevating screw material shall be GCI GR 30/ C45 / C60 minimum tensile strength 60 kg/mm ² and trapezoidal Thread of Min 60 mm	Vendor to confirm		
3.1.13	Arm Material shall be CI.GR.FG 260/ GCI GR 30, as per IS210 and Hardness shall be Min 200 BHN	Vendor to confirm		
3.1.15	Graduated Dials on headstock shall be of Stainless Steel / Chromium plated.	Vendor to confirm		
3.1.16	Flexible metal hose for coolant is preferable at headstock.	Vendor to Specify		
3.1.17	Centralised Lubrication System and all lubrication lines to be protected with metallic covers to protect from drilling chips.	Vendor to confirm		

3.1.18	Details of flood coolant system (around 15 lpm @ 1 bar pressure at discharge end near the tool tip).	Vendor to Specify		
3.1.19	Hardened and precision ground gears in main drive	Vendor to confirm		
3.1.20	Electro-hydraulic clamping through push button .	Vendor to confirm		
3.1.21	Spindle reversal clutch for tap withdrawal.	Vendor to confirm		
3.1.22	Automatic spindle feed with auto stop.	Vendor to confirm		
3.1.23	Mannual feed coarse and smooth	Vendor to confirm		
3.1.24	Lifting arrangement shall be provided for lifting and transportation purpose. Details to be provided	Vendor to Specify		
3.1.25	Complete anchoring system including foundation bolts, anchoring materials, fixtures, leveling shoes etc shall be supplied for the Machine etc.	Vendor to confirm		
3.2	GuideWays			
3.2.1	Width of Arm guide ways	Vendor to specify		
3.2.2	Width of column guide ways	Vendor to specify		
3.2.3	Sliding Surfaces on guide ways : Vendor to give type & technical details	Vendor to provide details		
4	SAFETY ARRANGEMENTS:			
4.1	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 specify the interlocks provided.	Vendor to confirm		
4.2	All the pipes, cables etc. on the machine should be well supported and protected.	Vendor to confirm		

4.3	All the rotating parts used on machine should be statically & dynamically balanced to avoid undue vibrations and suitable covers to be provided.	Vendor to confirm		
4.4	Emergency Switches at suitable locations as per International norms are to be provided.	Vendor to confirm		
4.5	Oil & water pipe lines should not run with electrical cable in the same tray / trench.	Vendor to confirm		
4.6	Projection of operating levers / Hand wheel on the drill head if any shall not be hindrance to operator safety.	Vendor to confirm		
5	ACCESSORIES			
5.1	Cast iron box table min .3000mmx1500mmx800mm with T slots width 28mmX250 mm pitch : 1 Nos.	Vendor to confirm		
5.2	Coolant equipment with pump and motor 1 no	Vendor to confirm		
5.3	Machine lamp for 220 V: 1 No	Vendor to confirm		
5.4	Set of morse taper sleeves MT2/MT3, MT3/MT4, MT4/MT5, MT4/MT6, MT3/MT5, MT3/MT6 , MT5/MT6 and MT6/MT5 : 2 nos each	Vendor to confirm		
5.5	Extension Sleeve , MT5/MT6 , MT6/MT5 , MT6/MT4 , MT4/MT6 , MT5/MT5 , MT6/MT6 , length 600 mm . 1 nos each	Vendor to confirm		
5.6	Suitable Tapping Attachments with all collet to Tap of Sizes : M6,M8,M10,M16,M20,M24,M30,M36,M42,M48,M56,M64,M72,M80 as per IS 6175 : 2 set	Vendor to confirm		
6.0	GUARANTEE :			

6.1	Guarantee for complete Radial Drill Machine and all supplied accessories / equipments for 24 months from the date of final acceptance of the machine. Any spare required during guarantee period shall have to be arranged by the vendor free of cost and duty leaved have to be borne by the vendor	Vendor to confirm		
7	QUALIFYING CONDITIONS :			
7.1	The supplier/ vendor should be either an Original Equipment Manufacturer (OEM) or an authorized Dealer of the OEM for the offered machine . Along with the offer, dealers have to submit a valid certificate of Authorization from OEM for quoting the machine . Vendor should submit proof of the same	Vendor to confirm		
7.2	The OEM or the authorized dealer of the OEM must have supplied at least ONE machine of the OEM make of same or higher capabilities Of size 100 mm Radial Drill Machine (on the date of opening of Tender).	Vendor to confirm		
7.3	Copy of Purchase Order (PO) in the name of OEM or the authorized dealer of the OEM for machine as per clause 7.2 is to be submitted along with the offer. The type, make and model of the machine should be clearly mentioned in the PO copy. Vendor should submit proof of the same.	Vendor to confirm		
8	OTHER QUALIFICATION REQUIREMENTS (TO BE NECESSARILY SUBMITTED AT THE TIME OF FINAL TENDERING)			
8.1	Authorized Dealer of the OEM shall be required to submit the declaration for support from OEM for Erection & Commissioning, after sales service & necessary spares support for minimum of 5 years from the date of commissioning. In addition to the above, a back-to-back guarantee from OEM for performance of the machine is also required.	Vendor to note		

8.2	<p>The machine referred in Clause 7.2 should be working satisfactorily for more than one year after commissioning (on the date of opening of Tender).</p> <p>The Performance Certificate submitted should be recently issued (i.e. its date of issue should not be more than 1 year old from the tender opening date) from the customers regarding satisfactory performance of the machine supplied to them vide the Purchase Order as per clause 7.3.</p> <p>Note: Vendor to indicate clearly the Purchase Order (PO) Number, PO Date and Date of Commissioning of the machine on the performance certificate.</p>	Vendor to note		
8.3	<p>Vendors should necessarily furnish following details about the companies where they have supplied the machine for which they are submitting the documents in order to fulfil qualifying criteria as mentioned in clause 7:</p> <p>A) Name of the customer/company. B) Complete postal address. C) Broad parameters of the machine and application. D) Name & designation of contact person. E) Phone, Mobile & E-mail address of the contact person.</p>	Vendor to note		

8.4	<p>Financial PQC: Vendor should have minimum average turnover of Rs. 75 lakhs for the last 3 consecutive years ending March 2021. Vendor to submit Profit & Loss Account Statement of last three consecutive years ending march 2021 as documentary evidence for the same.</p> <p>For Micro & Small Enterprises (MSE) & Start-Up Vendors who are OEM, no Financial PQR criteria is required. However, if they are quoting as authorised dealer of OEM then either OEM or the concerned MSE & Start-up vendor should necessarily qualify the financial PQC as mentioned above.</p>	Vendor to note		
9	MAKE IN INDIA (MII) CONTENT			
9.1	Vendor to mention the Make In India content (Value addition in India) of the offered machine in percentage (%). Details to be submitted.	Vendor to Specify		
10	MISCELLANEOUS			
10.1	<p>The sample sketches (Annexure 2) (i) Base frame m/c (ii) Pole end plate m/c (iii) Stator frame and slip ring (iv) Stator frame m/c are enclosed for the purpose of clarity of requirement to potential bidders. These sketches are for the purpose of explanation of extreme machining dimensions only. These sketches are confidential in nature and must not be used directly or indirectly in any way detrimental to the interest of BHEL.</p>	Vendor to note		
10.2	Potential vendors can visit to BHEL works on prior appointment for any clarification & discussion about our requirement.	Vendor to note		

10.3	BHEL reserves the right to verify information provided by the Vendor at their referred customer's works including machining accuracies (For the machine mentioned in qualifying criteria). It shall be the responsibility of the vendor to facilitate the visit of BHEL's team at their referred customer works. In case the information provided by vendor is found to be false / incorrect, the offer shall be rejected.	Vendor to note		
10.4	BHEL reserves the right to assess the OEM or the authorized Dealer of the OEM, with respect to their technical and financial capability (As per the information provided in clauses 7.1 to 7.3).	Vendor to note		