An ISO 9001 Company

Bharat Heavy Electricals Limited
(High Pressure Boiler Plant)
Tiruchirappalli – 620014, TAMIL NADU, INDIA
CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

NIT_60922 Corrigendum - 6 **NIC Tender ID: 2021_BHEL_5683_1**		Phone: +91 431 257 7421, 7297 Email : vkaruna@bhel.in, hari.r@bhel.in. Web : www.bhel.com	
TWO PART BID Tender to be submitted in two Parts through online EPS website: https://eprocurebhel.co.in	**Enquiry Number:** **2622100033**	**Enquiry Date:** **15.10.2021**	**Extended Due date for submission of quotation:** **25.01.2022**
You are requested to quote the Enquiry number date and due date in all your correspondence. This is only a request for quotation and not an order. **Please note that under any circumstances both** delayed offer **and** late offers **will not be considered. Hence vendors are requested to ensure that the offer is uploaded in the EPS website before the closing time mentioned in the online enquiry.**			
Tender Description: CNC Deep Hole Drilling Machine, Qty: 1 No.			

Corrigendum –6 issued for

1	**Due date for the submission of quotation is extended to 25.01.2022**

	Details of Technical Corrigendum –6	
	PART B of the Tender Technical Specification	
S. no.	**Tender Specification**	**AMENDED / SHALL BE HEREAFTER READ AS**
1.3	**Drilling requirement:** a) Through Hole Dia.: 19.22 + 0.13 / -0.0 mm b) Depth of hole to be drilled: 450 mm c) Pitch between hole centres: 22.517 mm (vertically), 26 mm (horizontally) d) Quality requirement: - i. Positional accuracy of hole: **0.01 mm** radially and ii. Drift tolerance of hole as follows • **0.05 mm** radially for Hole dia. 19.22 mm over length of 450 mm • **0.1 mm** radially for Hole dia. 32 mm over length of 1000 mm iii. Surface roughness of drilled hole: 1.6 microns Ra or better Sketch given in Annexure A and inspection procedure given in Annexure B	**Drilling requirement:** a) Through Hole Dia.: 19.22 + 0.13 / -0.0 mm b) Depth of hole to be drilled: 450 mm c) Pitch between hole centres: 22.517 mm (vertically), 26 mm (horizontally) d) Quality requirement: - i. Positional accuracy of hole as follows • **Max. 0.05 mm** radially with 3 spindles in operation and • **Max. 0.03 mm** radially with single spindle in operation ii. Drift tolerance of hole as follows • **Max. 0.12 mm** radially for Hole dia. 19.22 mm over length of 450 mm • **Max. 0.3 mm** radially for Hole dia. 32 mm over length of 1000 mm iii. Surface roughness of drilled hole: 1.6 microns Ra or better Sketch given in Annexure A and inspection procedure given in Annexure B

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2.7	Positional accuracy on all axes: min. 10 microns or better to meet the job requirement	Positional accuracy on all axes: as per clause 35.3 or better to meet the job requirement
7.17	The coolant tank should be fitted with skimmer for regular cleaning of coolant from contamination with tramp oil.	**CLAUSE DELETED**
24.4	**Oil fume extractor/eliminator**:- A Suitable fume extractor for absorbing the coolant oil fumes/ mist generated during drilling operation near the spindle to be provided. The price of the same shall be quoted separately in the price offer.	**CLAUSE DELETED**
24.4.1	The coolant oil collected shall be drained /routed for reuse. The equipment shall be reliable with low maintenance.	
24.4.2	Exhaust fan / blower capacity in CFM	
24.4.3	Details of filter elements	
25.0	**Quality Inspection / Measurement System**	**CLAUSE DELETED**
25.1	An independent inspection system for measuring the positional accuracy and drift in the drilled job as specified in this specification. The price of such system shall be quoted separately in the offer.	
35.3	Positioning Accuracy on traversing axes (Pa per 1000mm): + 0.01 mm	Positioning Accuracy on traversing axes (Pa per 1000mm): + 0.015 mm
35.4	Repeatability on traversing axes (Ps per 1000mm): + 0.015 mm	Repeatability on traversing axes (Ps per 1000mm): + 0.02 mm
36.1	**Tests/Activities to be carried out at supplier's works on the machine before dispatch:**	
36.1.5	Machine shall be tested by using the size of the BTA (STS) drill for drilling hole of Dia. 19.22 mm (length/ thickness 450 mm) and BTA (STS) drill suitable for hole dia. 32 mm (length/ thickness 1000 mm) and the drilled hole shall be proved out for the positional accuracy and drift acceptance requirement mentioned in this specification. Sample test piece shall be arranged by supplier	The offered Machine shall be tested by using the size of the respective BTA (STS) drill for drilling hole on the sample test piece at supplier's works. The sample test piece shall be of 20MnMoNi55 quenched and tempered steel or equivalent material (SA508C3/16MnD5/18MnD5) having hardness of minimum 180 BHN. For Hole dia. 19.22 + 0.13 / -0.0 mm:- Test piece dimensions approx. 700 x 700mm face with min. thickness of 450 mm. No. of sequence to be drilled with 3 spindles

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		simultaneously: 100 nos. (300 holes) For hole dia. 32 mm:- Test piece with suitable dimensions for drilling depth of 1000 mm. No. of Holes to be drilled per spindle: 5 nos. The drilled hole shall be proved out for the positional accuracy and drift acceptance requirement mentioned in this specification. Sample test piece as above to be arranged by supplier.
-	Annexure B - Drilled Hole Inspection Procedure and its requirements	Shall be replaced with the revised Annexure B enclosed herewith

Tenders should be uploaded before 25.01.2022, 11:00 hrs. Online opening of tenders will be done on 25.01.2022, 15:30 hrs	Yours faithfully, For **BHARAT HEAVY ELECTRICALS LIMITED** AGM / MM/ Capital Equipment

V. KARUNAKARAN
Addl. General Manager
Capital Equipment / MM
BHEL, TRICHY - 620 014.

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Annexure B

Drilled Hole Inspection Procedure and its requirements

1) The drilled holes shall be visually inspected with borescope and the holes shall be free from any longitudinal scratches and scroll marks. The surface finish shall be tested with an instrument at entry and exit.

2) The diameter of the holes at two mutually perpendicular directions shall be checked for every hole at a depth of 3 mm from both ends and every 100 mm interval. Bore dials or inside micrometers shall be used for the above check. Holes of dia. exceeding the diameter tolerance limit of +0.13 / -0.0 mm are not acceptable.

3) In 1st trial component ligament of every hole with respect to the surrounding six holes shall be measured both on the drill entry and exit ends. Ligaments on entry side as 6.78 +0.2 /-0.33 mm and on exit side as 6.78 +0.7 / -0.7 mm are acceptable limits.

4) The drift of the hole from the entry to the exit of the drill shall be measured for every hole. The drift in any direction shall not exceed the requirement as per clause 1.3 of Part B. The drift measurement shall be done using optical methods.

5) The position of any hole is to be determined as follows. The micro alignment telescope is rigidly set to the machine. The micrometers are made to read zero. By giving the command to the Deep Hole Drilling machine the telescope cross wires are coincided with the center of the target placed in the first drilled hole. The X-Y commands to the machine are made zero. By giving the command to the machine the telescope is moved to see the center of target in any required hole. Fine adjustments are made by the micrometer. The position of the hole with respect to the first drilled hole is given by the display of the machine plus the micrometer reading. The difference between the positions of any two adjacent holes obtained as described above shall be treated as the pitch of the holes in that direction. Deviation in the positions of every hole from the said fixed reference point / axes (which is the first drilled hole) shall not exceed the requirement as per clause 1.3 of Part B.

6) The hole shape at entry/exit shall be mapped by measuring the hole dia. at 4 orientations using bore dial or air gauge.

7) The drilled holes shall be checked by a GO-NoGo bar gauge for hole size and GO-NoGo gauge for front and rear ligaments.