INDENT NO. 20151733

TECHNICAL SPECIFICATION FOR 'PNEUMATIC HAMMER FOR STATOR SLOT WEDGING'

SPECIFICATION NO. EMT- 6832, Required Qtv. =2 nos.

(This specification is for one no. Pneumatic Hammer)

SL.NO.	DESCRIPTION OF BHEL REQUIREMENT	REQUIRED	OFFERED	DEVIATION
1.0	**PURPOSE :-**			
	After laying of stator winding bars in the slot of wound core of THDF-125/67, 800 MW type of generator, stator slot wedges are inserted in the slot for keeping the bars intact in the slots and permanently protection from possible vibrations in order to avoid damage to the insulation and the bars. The tightness of stator slot wedges is ensured by putting suitable thickness insulating packing's. Pneumatic Hammer will be required for driving/insertion of stator slot wedges in the slot of wound core. Note: - This Pneumatic Hammer will be used for the insertion of stator slot wedges in the slot of wound stator. **Vendor may see the stator slot wedges and slot of stator core at BHEL Haridwar works, before submitting the offer.**			
2.0	**SCOPE :-**			
	The scope of supply includes the design, manufacturing and supply of Pneumatic Hammer. The scope also includes commissioning and proving of performance of Pneumatic Hammer to the satisfaction of BHEL, at BHEL Haridwar works.	**01 No.**		
3.0	**JOB DESCRIPTION:-**			
	Stator core slot width and length of 800 MW TG sets = **44.5 mm & 6700 mm** respectively. Stator slot wedges are to be inserted in dovetail groove of core. The dimensional details of dovetail and stator slot wedges are enclosed in annexure-I & II.			
4.0	**TECHNICAL SPECIFICATION AND DESCRIPTION OF PNEUMATIC HAMMER:-**			

4.1	**Compressed air:** Pneumatic Hammer will work by using Clean and dry compressed air. Vendor should provide suitable hose pipe for connection of pneumatic hammer with compressed air point. **Note: - BHEL shall provide compressed air of approx. 6 bar pressure having traces of moisture. Vendor shall provide suitable system (filter, etc.) to make compressed air moisture free and fit for application.**			
4.2	If compressed air pressure of 6 bar is not sufficient for operation of pneumatic hammer, then vendor should inform the same during submitting the offer for smooth working of pneumatic hammer.			
4.3	**Piston:** The piston of the hammer will be located inside a cylindrical structure hub which will be moved by pumping the compressed air in the cylinder. **The Hub of Pneumatic Cylinder= 550 mm (approx.)**			
4.4	**Chisel:** The speed and force of the piston will be regulated by the chisel which is a metal bar at the bottom of the cylinder. Piston hits the chisel and hence causes the movement of chisel. **The chisel inlet tube diameter = 53 mm (approx.)**			
4.5	The slot length is 6700 mm for 800 MW TG set. Stator slot wedging is started from the center of the core after locking the center wedge i.e. here it will be started from 6.7/2 = 3.35 meter. Therefore, Aluminum bar of different lengths are required to be used at the mouth of pneumatic hammer to reach particular slot wedge placed at far from slot end. This aluminum bar will be hit by the chisel of pneumatic hammer and finally the aluminum bar will drive the stator wedge in the slot. **The Aluminum bars will be in the scope of BHEL.**			

	Note: - If during insertion/driving, any slot wedge rupture and fly away then it may be dangerous for people working there. Suitable arrangement should also be suggested/provided by the vendor to handle such situation.			
4.6	Suitable Stroke arrangement should be provided in the pneumatic hammer for required force transferred onto the slot wedges for its insertion in the slot. The stroke may be manually adjustable. The impact force should be such that it can drive the slot wedges in the slot. **Energy transferred in joule=30-40 joule (Approx.)** After insertion of stator slot wedges in the slot we check the wedge tightness of stator wedges. The permitted radial movement for stator slot wedges is max. 0.25 mm with the applied pressure of approximately 300 kg/cm2 for 800 MW TG set. **Note: - The parameters (clause no. 4.1 to 4.6) are given for reference. However, vendor may select better parameters to achieve intended performance of the system. It will be sole responsibility of vendor to prove the performance of the Pneumatic Hammer at BHEL works.**			
4.7	Hook arrangement should be provided at suitable location for lifting and proper handling of pneumatic hammer during operation. Weight of the Pneumatic Hammer should be mentioned in the offer. Also we understand that a person will hold the Hammer for giving the strokes. Therefore, at the rear end/support end of the Hammer cushion/suitable material to be provided for trouble free handling during its operation.			
4.8	**Silencer:** We understand that the Pneumatic Hammer will create heavy noise during its operation. Therefore, silencers for minimizing the noise should be provided in the pneumatic hammer.			

5.0	**DRAWING/SKETCH:**			
5.1	Vendor shall furnish the drawing / sketch of pneumatic hammer, along with the offer. Vendor should indicate the overall dimension of the hammer with length, width/diameter and also the details of different components used in the Pneumatic hammer.			
5.2	**Vendor shall also submit the Drawing/Sketch of 'Pneumatic Hammer' for BHEL approval, within 4 weeks after placement of Purchase Order.**			
6.0	**SPARES:-**			
6.1	Recommended spares for 2 years trouble free operation of the equipment, to be quoted in the offer.	Vendor to furnish the list of spares in the offer		
7.0	**ENVIRONMENTAL CONDITION:-**			
7.1	Ambient Temperature : 0°C to 48°C			
7.2	Relative humidity- 30 to 90 %			
7.3	Voltage fluctuation- +/- 15 %			
8.0	**POWER SUPPLY**			
8.1	BHEL will provide **input power supply 3 phase, 3 wire, 415 + / - 15% volt, 50 + / - 3% Hz** to Isolator Switch (BHEL scope) nearby Pneumatic Hammer.			
9.0	**ERECTION & COMMISSIONING :-**			
9.1	Erection, Commissioning and Performance proving of Pneumatic Hammer shall be done by the vendor. Pneumatic Hammer will be finally accepted only after successful demonstration for insertion of stator slot wedges in the slot of wound stator of any THDF type of TG (Preferably of 800 MW TG if available at the time of Commissioning) by putting two ripple springs beneath stator slot wedges at BHEL, Haridwar works. **Note: - During commissioning man power support if needed, same will be provided by BHEL.**	Vendor To confirm		

9.2	During commissioning if any item is damaged / not functioning, vendor shall replace the same without any cost to BHEL.	Vendor to confirm		
9.3	**Vendor should recommend suitable lubricant for the Pneumatic Hammer. First filling of lubricant shall be in the vendor's scope of supply.**	Vendor To confirm		
10.0	**OPERATION & MAINTENANCE MANUAL :**			
10.1	Vendor shall furnish 3 sets of detailed Operation & Maintenance manual in English language with the consignment. The operation & maintenance manual should contain drawings, make and specification of components used in Pneumatic Hammer.			
11.0	**GUARANTEE/WARRANTEE :-**			
11.1	Vendor shall furnish 12 months guarantee/warrantee of pneumatic hammer from the date of commissioning.	Vendor To confirm		
11.2	Any spare required during guarantee/warrantee period shall have to be arranged by the vendor free of cost (up to BHEL Haridwar stores) and duty levied has to be borne by the vendor.	Vendor to confirm		

(Ranjeet Kumar)
E2, EMT

(Kapil Maheshwari)
E2, Wex, Mech-Bl-1

(Amit Kumar)
E4, Prod-Bl-1

DGM(EMTL) U.K. SINGH

ANNEXURE-II

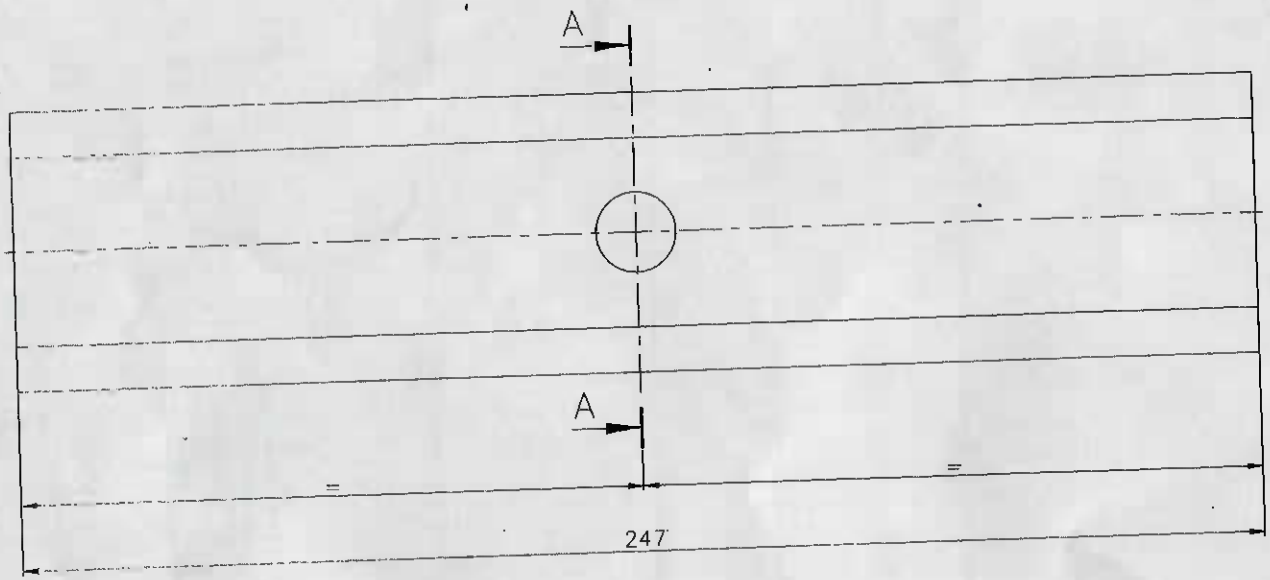
<PART NUMBER> <PART REVISION NUMBER>

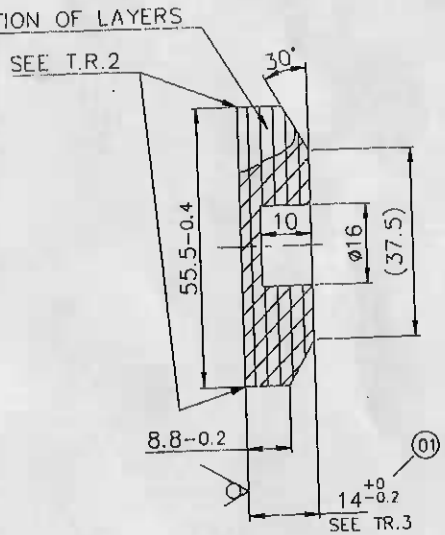
FIRST ANGLE PROJECTION | (ALL DIMENSIONS ARE IN mm)

FORM: DG-38(B)

6.3 THE REST

DRAWING NO 31350801328





SECTION A-A

TECHNICAL REQUIREMENT

1. IDENTIFICATION ACCORDING TO HW 0400397.
2. THESE EDGES TO BE ROUNDED OFF SLIGHTLY.
3. CARE SHALL BE TAKEN IN MAINTAINING THE THICKNESS OF THE WEDGE WITHIN SPECIFIED TOLERANCE.

(01)

INVENTORY NO. | SIGN & DATE | 21-0402-128'43/033 REF. DRG NO.

CBOM NO. 01350801039			STATUS OF DRG.
AGREED DEPT.	NAME	SIGN	DATE
EMT	AEMTRK	AEMTRK	09/05/2011

GRADE OF UNTOL. DIM.:-

M/CG- ~~X/Z~~/M/F AA 0230208

~~WELDING- A/B/C/D- AA621104~~

~~GAS CUTTING 'T3'AA621101~~

REV.	DATE	ALTERED / CHECKED
01	08.07.13	ALTERED RAJKUMAR Sd- / CHECKED AJAY Sd-

CHANGES DONE AS PER CHANGE ADVICE NO. TGE--13-F0188.

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: THDF 125/67

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	STGERKS	STGERKS	06/05/2011	
CHD	STGEAJY	STGEAJY	09/05/2011	
APD	ATGEVK	ATGEVK	13/05/2011	73, 74

DEPT. TGE | CODE 4133 | SCALE 1:1 | WEIGHT(Kg.) 0.25 | REF. TO ASSY. DRG. 0-135-08-01039 | ITEM NO. 33 | NO.OF ITEMS 75, 77

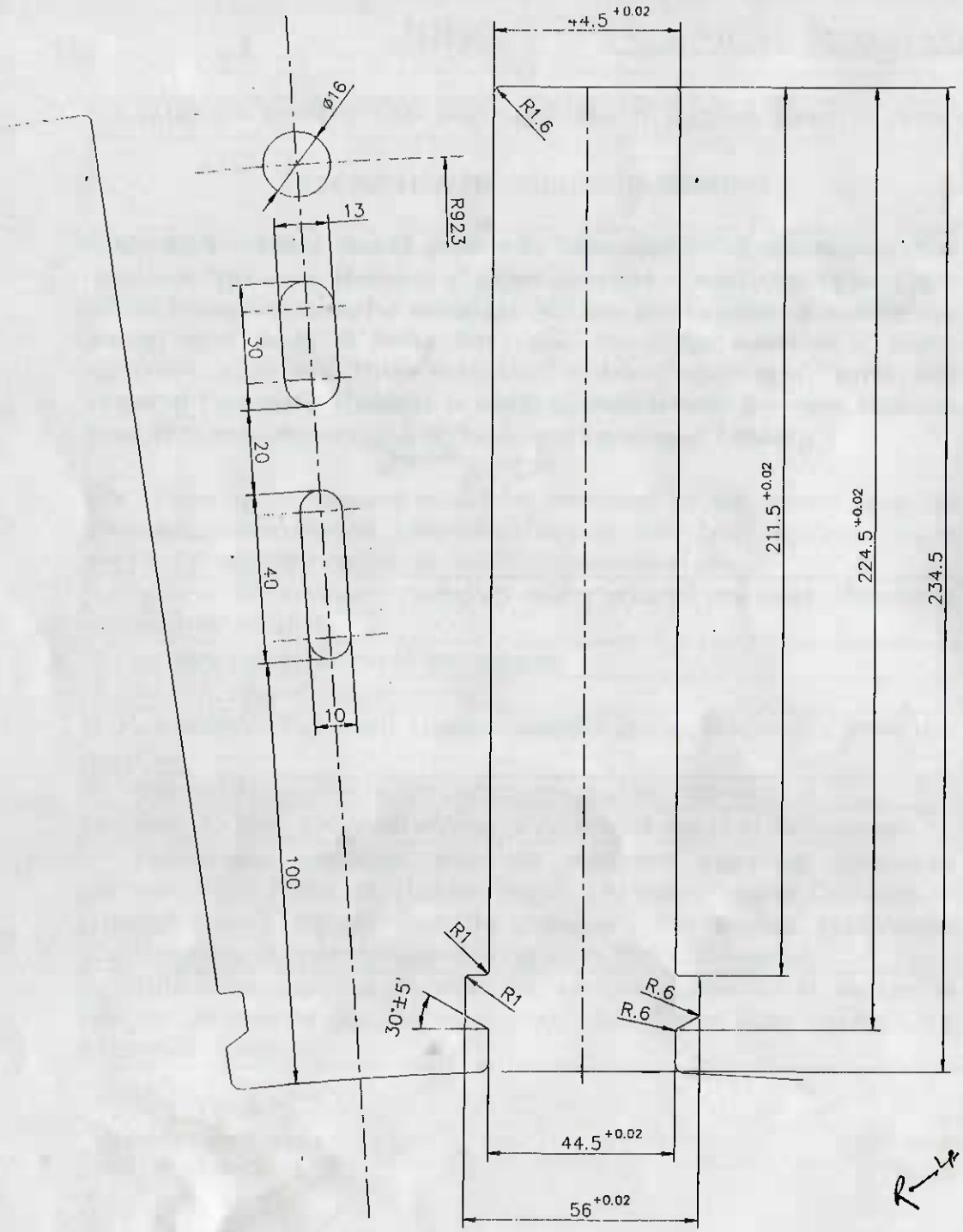
TITLE: STATOR SLOT WEDGE

DRAWING NO. 31350801328 (22, 23, 24)

SHEET NO. 1 | NO.OF SHEETS 1

SIZE A3

ANNEXURE-1


44.5 +0.02
Ø16
R1.6
13
R923
30
20
40
10
100
211.5 +0.02
224.5 +0.02
234.5
R1
R1
30±5'
R.6
R.6
44.5 +0.02
56 +0.02

INDENT NO. 2015/1733

BHEL	TECHNICAL PURCHASE SPECIFICATION	EMT-6832

QUALIFYING CONDITIONS FOR 'PNEUMATIC HAMMER FOR STATOR SLOT WEDGING':-				
DESCRIPTION OF BHEL REQUIREMENT	**TO BE SUPPLIED/ CONFIRMED/ SUBMITTED BY**	**OFFERED**	**DEVIATION**	**REMARKS**
Only those vendors should quote who have supplied & commissioned at least one Pneumatic Hammer of chisel diameter of minimum 40 mm, Hub of the Pneumatic cylinder minimum 500 mm and capable of transferring energy of at least 20 joules for stator slot wedge insertion in Turbo generator in the past fifteen years (on the date of opening of Tender) and referred Pneumatic Hammer is working satisfactorily for more than one year after commissioning. (~~On~~ Prior to the date of opening of Tender). The following information should be submitted by the vendor about the companies where similar Pneumatic Hammer have been supplied. This is required from all the vendors for qualification of their offer.	Vendor to accept & confirm.			
1. Name of the customer / company where referred Pneumatic Hammer is supplied and installed.	Vendor to inform.			
2. Complete postal address of the customer.	Vendor to inform.			
3. Month & Year of commissioning.	Vendor to inform.			
4. Parameters of Pneumatic Hammer supplied and application for which it is supplied.	Vendor to inform.			
5. Name and designation of the contact person of the customer.	Vendor to inform.			
6. Phone, FAX no. and email address of the contact person of the customer.	Vendor to inform.			
7. Performance certificate from the customers regarding satisfactory performance of Pneumatic Hammer supplied to them (Original Certificate or Through E-mail directly from the customer). The original performance certificate may be returned after verification by BHEL, if required.	Vendor to submit.			
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.	Vendor to accept & confirm.			

(Kapil Maheshwari)
E2, Wex, Mech, Bl-1

(Amit Kumar)
(E4,Bl-1, LSTG)

(Ranjeet Kumar)
(E2, EMT)

DGM (EMT)