

BHARAT HEAVY ELECTRICAL LIMITED, JHANSI			
	Specification No	7103 (A)	
	Item No	ME-3/3/2688	
	Location	BOGIE SHOP	
	Quantity	ONE NUMBER	
SPECIFICATION CUM COMPLIANCE CERTIFICATE OF INDUCTION HEATER			
Note :			
1	VENDOR must submit complete information against clause No-18.0 (Qualifying Condition). The offer meeting this clause would only be pprocessed		
2	The "Specified/to be confirmed by vender" Coloumn and where applicable, the " Devitaions" Coloumn of the formate shall be filled in by the Vendor and submitted along with the offer. Technical details also submitted with the offer. Inadequate/ Incomplete. Ambiguos, of unsustainable information against any of the clauses of hte specification / requirement shall be treated as non- compliance.		
3	The offer and all documents elclosed with offer should be in English language only.		
SCOPE:			
DESIGN, MANUFACTURING, SUPPLY, ERECTION & COMMISSIONING OF INDUCTION HEATER FOR BEARING AND PINIONS AS PER SPECIFICATION BELOW			
S.NO.	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	DEVIATIONS
1.0	PORPOSE & WORK PIECE MATERIAL:		
1.1	Induction heating system is required to heat and mount roller bearings, pinions, gears and other shrink fit components on to the matching shaft.	VENDOR TO CONFIRM	
1.2	The induction heating system shall also be suitable for motor suspension unit assembly and inner race of axle box assembly.	VENDOR TO CONFIRM	
1.3	The device shall be worked on electro- magnetic induction principle.	VENDOR TO CONFIRM	
1.4	Yoke should have vertically mounted as per requirement of job. The overall construction shall be as per enclosed sketch N0. BHEL/JHS/WEX/A-4/1822	VENDOR TO CONFIRM	
2.0	SPECIFICATION		
2.1	PARAMETER	VENDOR TO CONFIRM	
2.1.1	Inside dia : 40mm min. to 325 mm Max.	VENDOR TO CONFIRM	
2.1.2	Max. work piece dia : 480 mm	VENDOR TO CONFIRM	
2.1.3	Height of work : 200 mm	VENDOR TO CONFIRM	
2.1.4	Weight of Job : 50 Kg. Max.	VENDOR TO CONFIRM	
2.1.5	Heating temp. Min. : 100 degree Calcious	VENDOR TO SPECIFY	
2.1.6	Heating temp. Max. : 300 degree Calcious	VENDOR TO SPECIFY	
2.1.7	Heating time Max. : 20 minutes	VENDOR TO SPECIFY	
2.1.8	Supply voltage : 415 Volt 3 Phase 50 HZ A.C.Supply	VENDOR TO CONFIRM	
3.0	FEATURES		
3.1	The equipment to be self contained unit	VENDOR TO CONFIRM	
3.2	The main frame of the equipment shall be heavy, rigidly rainforced welded steel construction.	VENDOR TO CONFIRM	
3.3	The equipment should be streamlined in appearance with maximum resistance to mechanical deflection.	VENDOR TO SPECIFY	
3.4	The whole equipment shall be mounted on four wheeled trolley of which two to be fixed type and two of caster wheel type to help easy movement on the shop floor.	VENDOR TO CONFIRM	
3.5	Necessary eye bolts shall be provided for the lifting the whole unit.	VENDOR TO CONFIRM	
3.6	The overall design must be compact, easy to operate by a single person and easy to maintain.	VENDOR TO CONFIRM	
3.7	The equipment has an automatic in-built demagnetising device of sufficient strength.	VENDOR TO CONFIRM	

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3.7.1	Demagnetising the objects shall be provided, since the steel components become magnetic during induction heating.	VENDOR TO CONFIRM	
3.7.2	Equipment shall also be used only for demagnetising.	VENDOR TO CONFIRM	
3.8	The system shall have suitable moveable heat resistive trolley for job loading and unloading and heating of job in horizontally.		
4.0	The induction heating equipment shall consist of following :	VENDOR TO CONFIRM	
4.1	Main equipment of Induction heater	VENDOR TO CONFIRM	
4.2	Vertical yokes 1 No. each	VENDOR TO CONFIRM	
4.2.1	40x40 mm	VENDOR TO CONFIRM	
4.2.2	75x75 mm	VENDOR TO CONFIRM	
4.2.3	90x90 mm	VENDOR TO CONFIRM	
4.2.4	120 x 120 mm	VENDOR TO CONFIRM	
4.2.5	Suitable yokes storage stand for different size yoke shall be provided.	VENDOR TO CONFIRM	
4.3	Digital microprocessor controlled and indicating temperature with Cr Al thermocouple cable and socket.	VENDOR TO CONFIRM	
4.4	Suitable control panel with thyristorised power controller ramping system for soft start and auto ramping.	VENDOR TO CONFIRM	
4.5	Rectangular horizontal limb over which vertical yoke of laminated steel adjusted suitably for different components. Each vertical limb has an induction coil wound around it.	VENDOR TO CONFIRM	
4.6	16 step power control for impedance matching	VENDOR TO CONFIRM	
4.7	The vertical yoke of laminated steel shall be adjustable by means of handles, so that the inner race/pinion to be heated could be placed on to the equipment.	VENDOR TO CONFIRM	
4.8	The heater is suitable for working on AC 415 Volt, 3 phase, 50 Hz A.C. supply system.	VENDOR TO CONFIRM	
4.9	5 meter long adequate cross section cable shall be provided.	VENDOR TO CONFIRM	
4.10	4 pairs of hand gloves shall be provided to handle heater bearings.	VENDOR TO CONFIRM	
4.11	Suitable moveable heat resistive trolley shall be provided for loading the job.		
5.0	OPERATION		
5.1	The equipment shall operate on two different modes	VENDOR TO CONFIRM	
5.1.1	MODE - 1 : Temperature mode	VENDOR TO CONFIRM	
5.1.2	MODE-2 : Time mode	VENDOR TO CONFIRM	
5.2	Each operating mode shall be controlled through electronic circuits using solid state devices.	VENDOR TO CONFIRM	
5.3	In temperature mode, the required level of temperature shall be set using feather touch control key on microcontroller based panel. When the preselected temperature is reached the heating cycle stops and demagnetising cycle comes on. Temperature display unit shall be provided for temperature with 1 inch wide letter.	VENDOR TO CONFIRM	
5.4	In time mode the heating time shall be set between 0-10 minutes and by adjusting time on the microcontroller based panel. When the pre-selected time is reached, heating cycle stop and demagnetizing cycle comes on. Time display unit shall be provided for display time with 1 inch wide letter..	VENDOR TO CONFIRM	

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6.0	METERING		
6.1	Meter for indicating KW, Power factor, Out put voltage and out put current shall be provided	VENDOR TO CONFIRM	
7.0	SAFETY	VENDOR TO CONFIRM	
7.1	The equipment shall be fully safe in operation.	VENDOR TO CONFIRM	
7.2	The unit shall be incorporates an auto- ramping cycle to avoid current surge due to sudden switching of full power.	VENDOR TO CONFIRM	
7.3	After heating and demagnetising cycle is over , an auto alarm shall be provided.	VENDOR TO CONFIRM	
8.0	PROTECTION		
8.1	Over current,over voltage and any other relay for the protection of system/ equipment are to be included as well as suitably interlocked for the safe operation.	VENDOR TO CONFIRM	
8.2	Necessary guards and protection covers are to be provided to protect the equipment.	VENDOR TO CONFIRM	
9.0	ACCESSORIES AND TOOLKITS		
9.1	The induction heating system shall be supplied complete with all standard accessories and tool kit.	VENDOR TO CONFIRM	
10.0	ELECTRICAL SUPPLY AND CONTROLS		
10.1	The equipment shall be suitable for the operation on 415 Volts, 3 Phase, 4 wire 50HZ A.C.Supply. The necessary transformer for step down to lower voltage for the controls etc, fuses/MCB, terminal connectors are to be provided.	VENDOR TO CONFIRM	
10.2	The necessary cable and connection from control panel to various items of the equipment, isolator for control panel for incoming supply are also to be included in the supply and details to be furnished along with offer.	VENDOR TO CONFIRM	
10.3	Single point 415 Volt 3phase 4 wire 50Hz A.C.Supply will be provided by BHEL.	VENDOR TO CONFIRM	
10.4	The connection shall be made through copper crimping type lugs.	VENDOR TO CONFIRM	
10.5	Control panel wiring shall be made by 2.5 sq. mm copper conductor PVC insulated wire with numbered farrules.	VENDOR TO CONFIRM	
10.6	All controls and electrical & electronics circuits are to be grouped together and located in control panel.	VENDOR TO CONFIRM	
10.7	The motors shall be ABB/Bharat bijlee/GEC/Crompton/ only	VENDOR TO CONFIRM	
11.0	PAINTING		
11.1	Two coats of red oxide metal primer and finished with two coats of synthetic enamel paint of verdigris green paint.	VENDOR TO CONFIRM	
12.0	DOCUMENTATION :		
12.1	During participation in technical Bid.		
12.1.1	G.A. Drawing.		
12.2	After Receipt of Order: (For approval)		
12.2.1	Three set of GA drawing		
12.2.2	Three sets of electrical schematic and control circuit diagram	VENDOR TO CONFIRM	
12.2.3	Q.A. Plan		

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12.3	With the supply		
12.3.1	Three sets of operation manual		
12.3.2	Three sets of maintenance manual of induction heater. Spares - part list concerned drawing of spares.	VENDOR TO CONFIRM	
12.3.3	Catalogues, O&M Manuals of all bought out items including drawings- 3 set	VENDOR TO CONFIRM	
13.0	DETAILS TO BE SUBMITTED WITH THE OFFER		
13.1	Dimensioned outline general arrangement drawing	VENDOR TO SUBMIT	
13.2	Technical literature	VENDOR TO SUBMIT	
13.3	Make, type, capacity & write -up on digital microprocessor based temperature controller, temperature indicator used.	VENDOR TO SUBMIT	
13.4	Details of safety devices incorporated.	VENDOR TO SUBMIT	
13.5	Details of thyristorised control panel.	VENDOR TO SUBMIT	
13.6	Schematic diagram of control panel	VENDOR TO SUBMIT	
13.7	Temperature rise/hours	VENDOR TO SUBMIT	
13.8	List of standard accessories supplied with the equipment.	VENDOR TO SUBMIT	
13.9	List of optional accessories along with items price.	VENDOR TO SUBMIT	
13.10	Details and type of lubrication.	VENDOR TO SUBMIT	
13.11	Type make and HP of motor	VENDOR TO SUBMIT	
13.12	Any special tools required for maintenance and repair of the equipment with item wise price details.	VENDOR TO SUBMIT	
13.13	Total electrical load	VENDOR TO SUBMIT	
13.14	Total weight of the equipment.	VENDOR TO SUBMIT	
13.15	Total space required	VENDOR TO SUBMIT	
13.16	Erection and commissioning charges with duration	VENDOR TO SUBMIT	
13.17	Requirement of power, water, air etc with details like quantity and pressure.	VENDOR TO SUBMIT	
14.00	TRAINING		
14.10	Training to our operator, maintenance staff to be done at the time of commissioning of the equipment. (NOT LESS THAN SIX DAYS)	VENDOR TO CONFIRM	
15.0	GUARANTEE:		
15.1	24 Months form the date of acceptance of the equipment.	VENDOR TO CONFIRM	
16.0	MACHINE ACCEPTANCE	Vendor to confirm	
	(Tests/Activities to be performed & demonstrated by Vendor)		
16.1	Tests/Activities to be carried out at vendor's works on the machine before dispatch during Pre-Dispatch Inspection (PDI) by BHEL :	Vendor to confirm	
16.1.1	Demonstration of specified/offered	Vendor to confirm	
16.1.2	Demonstration of all features of the machine, control system & accessories	Vendor to confirm	
16.2	Tests/Activities to be carried out at BHEL works while commissioning the machine.	Vendor to confirm	

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16.2.1	Demonstration of specification point No. 5.0 (both mode)	Vendor to confirm	
16.2.2	Full load test to demonstrate the maximum temperature.	Vendor to confirm	
16.2.3	Demonstration of all features of the machine, control system & accessories to the satisfaction of BHEL for efficient and effective use of the machine.	Vendor to confirm	
16.2.4	Demonstration by actual use of all supplied accessories to their full capacity for required applications.	Vendor to confirm	
17.0	GENERAL		
17.1	The equipment is to be inspected & tested by our representative prior to dispatch.	VENDOR TO CONFIRM	
17.2	Provision to be made for the services of a test engineer to set all control & demonstrate the operation of the equipment at site.	VENDOR TO CONFIRM	
17.3	Complete erection and commissioning to be done by the supplier.	VENDOR TO CONFIRM	
18.0	QUALIFYING CONDITION		
18.1	Only those vendors, who have supplied at least one Induction heater for bearing/pinion of similar specification or higher capacity in the past ten years and such heaters are presently working satisfactorily for more than one year after commissioning, should quote. The following information is to be submitted by the Vendor about the companies where trolleys have been supplied. This is required from all the vendors for qualification of their offer.	VENDOR TO CONFIRM	
	1. Name of the customer / company where similar heater is installed. (copy of purchase order to be furnished)	VENDOR TO SPECIFY	
	2. Complete postal address of the customer.	VENDOR TO SPECIFY	
	3. Year of supplying / commissioning.	VENDOR TO SPECIFY	
	4. Name and designation of the contact person the customer.	VENDOR TO SPECIFY	
	5. Phone, FAX, no and E-mail address of the contact person of the customer.	VENDOR TO SPECIFY	
	6. Performance certificate from the customer regarding satisfactory performance of heater supplied to them	VENDOR TO SUBMIT	
19.0	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	
S.J.CHAKRABORTY	K.D.MANJHI	INDER MATHUR	MOHD. ARSHAD
SR. DGM (WE&S)	DGM (LMM/LMP)	SR. MANAGER (WE&S)	MANAGER (LMM)