



An ISO 9001
Company

Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirapalli – 620014, TAMIL NADU, INDIA

MATERIALS MANAGEMENT / CAPITAL EQUIPMENT

ENQUIRY NOTICE INVITING TENDER	Phone: +91 431 257 7653 Fax : +91 431 252 0719 Email : skaruna@bheltry.co.in Web : www.bhel.com
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TWO PART BID Tender to be submitted in Two Parts	Enquiry Number: 2731200007	Enquiry Date: dt.24.10.2012	Due date for submission of quotation dt.24.11.2012
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You are requested to quote the Enquiry number date and due date in all your correspondences. 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 reaching physically our office before 14.00 Hrs on the date of tender opening

Item No.	Item Description	Quantity
10	Supply and Commissioning of Wattage based Electric Tube Expansion System as per the Technical Specification, & Commercial Conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	02 Nos.

Important Points to be taken care during the submission of offer:-

1. Bidder's Response Column in technical specification sheet to be duly filled in without fail. Additional details provided in the offer may be supported with documentary evidence.
2. Check list to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.

BHEL's General guidelines /instructions including bank guarantee formats and list of consortium banks, commercial terms checklist can be downloaded from BHEL web site <http://www.bhel.com> or from the government tender website <http://tenders.gov.in> (public sector units > Bharat Heavy Electricals Limited page) Tender Enquiry reference "2731200007"

Tenders should reach us before 14:00 hours on the due date Tenders will be opened at 14:30 hours on the due date Tenders would be opened in presence of the tenderers who have submitted their offers and who may like to be present	Yours faithfully, For BHARAT HEAVY ELECTRICALS LIMITED Engineer / MM / Capital Equipment
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COE:TI:ATP: QUALIFYING CRITERIA FOR THE SUPPLY OF “Wattage based ElectricTube Expansion system for Titanium Tubes - Qty 2 Nos.”
PART – A

SECTION – I

The BIDDER is expected to give complete details against each clause in the table given below, with additional sheets those may be attached (giving clear reference number) to furnish and cover the requisite details / documents.

Sl. No.	PARTICULARS	BIDDER'S RESPONSE
1	BIDDER to provide the Profile of their Company	
2	The Bidder (OEM) shall have a minimum of TEN Years of Continuous Experience in the field of Design, Manufacture and Supply of Electric Tube Expansion system.	
3	List of customers to whom Electric Tube Expansion system were supplied, installed and commissioned till date.	
4	Details on SERVICE-AFTER-SALES Set-Up in India including the Addresses of Agents / Service Centres in India.	
5	Any Additional Data to supplement the manufacturing capability of the BIDDER for the subject equipment.	

COE:TI:ATP: QUALIFYING CRITERIA FOR THE SUPPLY OF “Wattage based ElectricTube Expansion system for Titanium Tubes - Qty 2 Nos.

PART – A

SECTION – II: The BIDDER has to compulsorily meet the following requirements to get qualified for submitting an offer for the “**Wattage based Electric Tube Expansion System**”.

SI. No.	REQUIREMENTS	BIDDER's RESPONSE
1	Only those Bidders (OEMs) should quote, who have supplied and commissioned at least Five numbers of wattage based Electric Tube Expansion system or higher, in the past three years (on the date of opening of Tender) and such equipment should presently be working satisfactorily for more than one year after commissioning (on the date of opening of Tender),.	
	The Bidder should submit following information where the wattage based Electric Tube Expansion systems have been supplied:	
1.1	Name and postal address of the customer or company where similar equipment is installed.	
1.2	Name and designation of the contact person of the customer.	
1.3	Phone, FAX no and email address of the contact person of the customer.	
1.4	Month and Year of commissioning of the equipment.	
1.5	Application for which the equipment is supplied	
2	Along with the Technical offer, the Bidder should submit the <u>Performance certificates from the customers for the satisfactory performance of the equipment supplied as per clause 1.0 above</u> (For obtaining the Performance certificate, a suggestive format is provided in SECTION – IV).	
3	Offers of only those Bidders who meet the above Qualifying Criteria will be considered for further evaluation.	
4	BHEL reserves the right to verify the information provided by Bidder. In case the information provided by Bidder is found to be false/ incorrect, the offer shall be rejected.	

COE:TI:ATP: QUALIFYING CRITERIA FOR THE SUPPLY OF “Wattage based ElectricTube Expansion system for Titanium Tubes - Qty 2 Nos.”
PART – A

SECTION – III

The BIDDER has to comply with the following, for accepting the Technical Offer for scrutiny by the Purchaser:

S. No.	REQUIREMENTS	BIDDER's COMPLIANCE
1	The BIDDER shall submit the offer in TWO PARTS-Technical [with PART A & PART B] & Commercial and Price Bid.	
2	The offer shall contain a comparative statement of Technical Specifications given by BHEL and the offered details submitted by the Bidder, against each clause. Merely stating 'CONFIRMED' or 'COMPLIES' or 'YES' or 'NO-DEVIATION' or similar words wherever 'Bidder to Specify' details in the technical comparative statement may lead to disqualification of the Technical Offer.	
3	The Technical Offer shall be supported by product Catalogues & Data Sheets and also technical details of Bought-Out-Items with copies of Product Catalogue to the extent possible.	
4	The Commercial Offer (given with the Technical Offer) shall contain the Scope of Supply and the Un-Priced Part of the Price-Bid, for confirmation of the inclusion of all the accessories, tooling's, attachments, auxiliary parts, spares, consumables, etc. with the main and basic equipment, to meet the technical specification requirements.	
5	BIDDER has to indicate the Country of Origin for the supply of equipment.	

SECTION – IV

PERFORMANCE CERTIFICATE

(On Customer’s Letter Head)

- 1. Supplier of the “Wattage based Electric Tube Expansion System” :

- 2. Make & Model of the “Wattage based Electric Tube Expansion System” :

- 3. Month & Year of Commissioning :

- 4. Application for which the “Wattage based Electric Tube Expansion System” is used :

- 5. Size of the tube and length of Expansion for which the “Wattage based Electric Tube Expansion System” is used :

- 6. Performance of the equipment : Satisfactory / Good / Average /
(Strike off whichever is not applicable) Not Satisfactory

- 7. After Sales Service : Satisfactory / Good / Average /
Not Satisfactory

- 8. Any other remarks :

Date:

Signature & Seal of the Authority
issuing the Performance Certificate

Wattage based Electric Tube Expansion system for Titanium Tubes – Qty : 2 Sets.

Clause	PARTICULARS AND BHEL SPECIFICATION	BIDDERS OFFER With Technical Details
1.0	Purpose: The Wattage based Electric Tube Expansion system operatable with 230 V AC power supply - is for Strength expansion of Titanium Tubes in the Titanium Tube sheet Holes.	Vendor to note
2.0	Job profile: (i) Stainless Steel Tubes of size 28x3 mm & (ii) Titanium tubes Specified vide Point 10.0 – prove out component	Vendor to note
3.0	Scope of Supply: The Electric Tube expansion system consists of : 1. Two sets of " Wattage based Torque Controller unit with foot Switch 2. Tube expansion Drive Units - 2 Nos each for each size of Tube 3. Voltage stabilizer with Portable trolley". 4. Necessary Spares for two years trouble free operation the above two sets. 5. Tube expanders – as mentioned below & shall be proved in the prove out component (specified vide point 8.0): (i) Contact Rolling expanders - 200 No. (ii) Stage I Expanders - 500 No. (ii) Stage II Expanders - 250 No. (iv) Stage III Expanders - 250 No. 6. Adopters for driving the Tool - 10 No (for each drive unit) 7. Trolley - 2 No. 8. Tool Kit - 2 set.	Vendor to confirm
4.0	Wattage based Torque Controller Unit with foot switch: (Shall be suitable to use for both sizes of tubes mentioned vide 2.0)	Vendor to confirm
4.1	The torque controller Unit shall be of "Wattage based control system" and it shall be of solid state design &	Vendor to confirm
4.2	Control functions shall be of Micro-controller based.	Vendor to confirm
4.3	Shall be provided with soft start for all drives	Vendor to confirm
4.4	Connected drive is to be automatically recognized and indicated in the display of the Torque Controller Unit.	Vendor to confirm
4.5	Appropriate wattage range is to be automatically selected for the connected drive.	Vendor to confirm
4.6	Provision shall be made for the display of actual drive wattage during expansion and also display shall be available to see the set wattage.	Vendor to confirm

Wattage based Electric Tube Expansion system for Titanium Tubes – Qty : 2 Sets.

Clause	PARTICULARS AND BHEL SPECIFICATION	BIDDERS OFFER With Technical Details
4.7	The Torque Control Unit shall have a facility for ‘manual reversing” of the drive by means of a push button.	Vendor to confirm
4.8	The Torque Control Unit shall also be provided with a “foot Switch” for forward, stop and reverse controls.	Vendor to confirm
4.9	Adjustable range for “Reverse time”	Vendor to specify
4.10	Adjustable range for “Trip time”	Vendor to specify
4.11	Adjustable range for “Pause time”	Vendor to specify
4.12	Suitable provisions shall be made to protect the Unit against Over current, Short Circuits, Voltage fluctuations, etc.	Vendor to specify
4.13	Foot Switches shall be robust, safe and should have switches (pedals) for “Forward, Stop & Reverse” operations.	Vendor to confirm
5.0	<u>Drive Units:</u> (Individual units for the sizes of tubes mentioned vide 2.0. Also refer 10.0)	
5.1	The drive units shall be capable of performing the tube expansion specified vide Point No. 2.0 . For the prove-out component, please refer Point 10 .	Vendor to confirm
5.2	Construction of the Drive units shall be rigid and robust.	Vendor to confirm
5.3	It should consists of a heavy duty Motor shall be able to cope up for frequent forward / reverse rotation – continuing for a longer period of time for more number of expansion cycles.	Vendor to confirm& specify.
5.4	The drive units shall be compatible with the Torque Controller Unit specified vide point No. 4.0	Vendor to confirm
5.5	As specified in point No. 4.4 , it should get recognized by the control system and display should appear.	Vendor to confirm
5.6	In addition to the handles for holding the drive unit manually, hook shall be provided at proper location to hold the Drive unit using a ‘counterbalanced rope with pulley’ in such a way to keep the axis of expander in horizontal position.	Vendor to confirm

Wattage based Electric Tube Expansion system for Titanium Tubes – Qty : 2 Sets.

Clause	PARTICULARS AND BHEL SPECIFICATION	BIDDERS OFFER With Technical Details
6.0	<u>Tube Expanders:</u>	
6.1	The tube expanders shall be designed to suit the requirement of prove out component mentioned in point No.10.0	Vendor to confirm
6.2	<p>Following mentioned steps of expansions are being planned to achieve the desired length of expansion, with overlap and the desired percentage thinning. Detailed dimensions and sketches are available in the Annexure-I (Sheet 1 & 2).</p> <p><u>Opn.1 – Contact Rolling</u> (before welding): 8 to 10 mm from the Tube sheet face. Percentage thinning required = 2% to 4%.</p> <p><u>Opn.2 – Stage I</u> (after welding): 7 to 39 mm from Tube sheet face</p> <p><u>Opn.2 – Stage II</u> (after welding): 33 to 65 mm from Tube sheet face</p> <p><u>Opn.2 – Stage III</u> (after welding): 57 to 89 mm from Tube sheet face</p> <p>Percentage thinning required for Opn. 2 = 3% to 5%.</p> <p>Required percentage thinning should be achieved uniformly in single set of expansion stages. Repetition of stages (Re-rolling) is not permissible.</p>	Vendor to confirm
6.3	Tube expanders shall be made up of high quality materials to work with Titanium tubes, for durability, surface finish and life.	Vendor to confirm
6.4	The tube expanders should not create any scratches or scoring marks inside the tube surface.	Vendor to confirm
6.5	Flaking of rollers / mandrels is not permissible.	Vendor to confirm
6.6	<u>Life of Expanders :</u> Desired number of expansion cycles that each of the tube expander can be used in the prove out component safely, to avoid any damage to the job / expander.	Vendor to specify
7.0	<u>Adopters:</u> Adopters shall be suitable to use with the drive unit to transmit the drive to the Tube Expanders.	Vendor to confirm

Wattage based Electric Tube Expansion system for Titanium Tubes – Qty : 2 Sets.

Clause	PARTICULARS AND BHEL SPECIFICATION	BIDDERS OFFER With Technical Details
8.0	Trolley: Suitable Trolley with good quality caster wheels shall be provide to accommodate the Torque Control system with the Drive unit and it should have free movement in any direction along the shop floor.	Vendor to confirm& specify
9.0	Tool Kit : Tool Kit should contain the tools required for maintenance and operation of the system and expanders, in sufficient numbers.	Vendor to confirm
10.0	Prove-out Component : For Drawing details - Refer Annexure – I Tubesheet outer diameter : 640 mm. Tube Hole Size : 14.0 mm Tube O D : 13.8 mm Tube ID : 11.1 mm Length of Expansion : 89mm (Please refer 6.2) No. of Holes per Tube Sheet : 600 Nos. Material : Titanium alloy Yield Strength at 20 Deg C : 372 MPa (Min) Ultimate Tensile Strength at 20 Deg C : 480-700 MPa Hardness : 175 – 250 HV	Vendor to confirm.
11.0	Electrical:	
11.1	230 V ± 10%, 50HZ ± 3 HZ, AC Power Supply will be provided by BHEL.	Vendor to confirm
11.2	Suitable protection system should be provided to prevent the operator from electric shock.	Vendor to confirm
11.3	Motors shall conform to IEC or Indian Standards	Vendor to confirm
11.4	The KW rating of the motors to be specified and the make of the motor should be acceptable to BHEL.	Vendor to specify
11.5	All adapters / receptacles should have compatibility with Indian equivalent.	Vendor to confirm

Wattage based Electric Tube Expansion system for Titanium Tubes – Qty : 2 Sets.

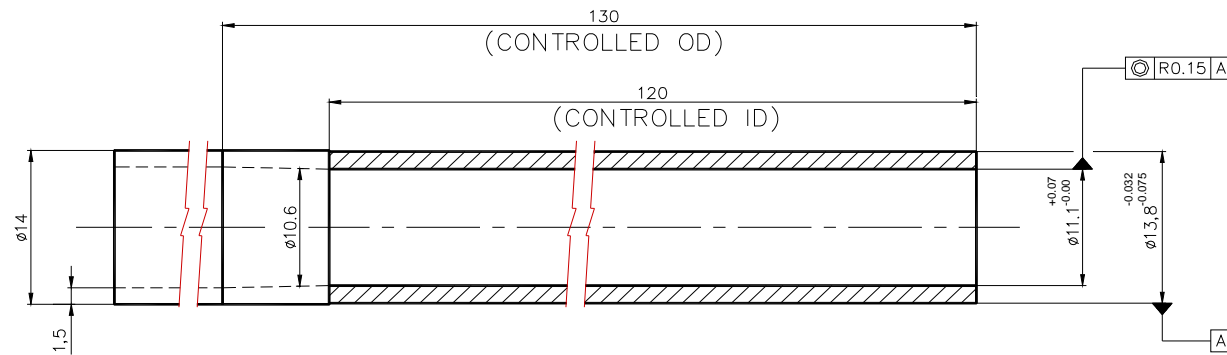
Clause	PARTICULARS AND BHEL SPECIFICATION	BIDDERS OFFER With Technical Details
12.0	Spares: Itemized break-up of Mechanical, Electrical and Electronic Spares used on the machine in sufficient quantity as per recommendation of BIDDER for 2 years of trouble free operation on three shifts continuous running basis (minimum of 3 complete sets) should be offered by BIDDER.	Vendor to confirm
12.1	Mechanical Spares: Bearings, Clutches, gears, circlips, Oil seals, 'O' Rings, trolley wheel set etc.	Vendor to specify
12.2	Electrical Spares: All types of Relays, Contactors, Proximity Switches, Printed Circuit Boards, Push Buttons, Indicating Lamps, Semiconductor Fuses, Special Fuses, Circuit Breakers etc.	Vendor to specify
12.3	All types of spares for the total machine and accessories shall 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 & Vendors to enable BHEL to procure these in advance, if required.	Vendor to confirm & specify
13.0	Painting : All non-working surfaces and control panels shall be given a primer coat & two coats of paint as specified in Vendor's Painting scheme. All unpainted surfaces shall be protected from rust during transit.	Vendor to confirm
14.0	Documentation:	
14.1	The following documents shall be furnished along with the offer : a. GA drawing / detailed catalogue of the offered "Tube Expansion system" with details & dimensions. b. Makes of the bought-outs c. Construction features	Vendor to furnish
14.2	After placement of order the vendor shall submit the details of expanders, roller length, cage dimensions etc. with relevant sketches / drawings (for Opn.1 and Opn.2 – three stages) for BHEL approval.	Vendor to confirm

Wattage based Electric Tube Expansion system for Titanium Tubes – Qty : 2 Sets.

Clause	PARTICULARS AND BHEL SPECIFICATION	BIDDERS OFFER With Technical Details
14.3	3 sets of the following documents shall be furnished during inspection and supply: a. GA drawing : Exploded view & Cross section assembly of gearing unit to be given. Make of Bought out items with Part no/Specification b. The operator instruction manual c. Maintenance instruction manual d. Guarantee / warranty cards of all bought-outs	Vendor to confirm
15.0	Acceptance :	Vendor to confirm
15.1	Acceptance at vendor's works: The Tube expansion system shall be offered for BHEL' Inspection at vendor's works prior to dispatch and all features shall be demonstrated. Prove-out components specified vide Point No. 10.0 is to be demonstrated for the desired expansion length and percentage thinning using the tube expanders. Life of the expanders also to be demonstrated for randomly selected 5 expanders. Materials for prove-out shall be supplied by the purchaser on Returnable basis. Collection of materials & Return shall be the responsibility of the vendor.	Vendor to confirm
15.2	Acceptance at BHEL works: During commissioning the vendor should demonstrate all features of the Tube expansion system using prove out component.	Vendor to confirm
16.0	Installation and commissioning at BHEL: Installation and commissioning of the "Tube Expansion system" at BHEL shall be in the scope of vendor	Vendor to confirm
17.0	Packing : The "Tube Expansion system" and other accessories, expanders etc shall be packed rigidly to avoid any transit damage and dispatched	Vendor to confirm
18.0	GUARANTEE: 12 months from the date of acceptance of the "Tube Expansion system" at BHEL or 18 months from dispatch whichever is earlier.	Vendor to confirm

Clause	PARTICULARS AND BHEL SPECIFICATION	BIDDERS OFFER With Technical Details
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ANNEXURE-I (SHEET 1 of 2)



TUBE DETAILS

TUBE HOLE DIAMETER : $\phi 13.9^{+0.043}_{+0.0}$

PERCENTAGE THINNING REQUIRED : 3 TO 6%

(FORMULA) PERCENTAGE THINNING = $\frac{(\text{TUBE OD} - \text{TUBE ID BEFORE EXPN}) - (\text{HOLE ID} - \text{TUBE ID AFTER EXPN})}{(\text{TUBE OD} - \text{TUBE ID BEFORE EXPN})} \times 100$

MATERIAL : TITANIUM

TUBE EXPANSION DETAILS

Clause	PARTICULARS AND BHEL SPECIFICATION	BIDDERS OFFER With Technical Details
	<p style="text-align: center;"><u>ANNEXURE-I</u> (SHEET 2 of 2)</p> <div style="display: flex; justify-content: space-around;"> <div data-bbox="448 526 1075 973"> <p style="text-align: center;"><u>EXPANSION OPN. 01</u> CONTACT ROLLING (BEFORE WELDING) ROLLING LENGTH = 8 to 10 mm PERCENTAGE THINNING = 2 TO 4 PERCENT.</p> </div> <div data-bbox="1164 494 1948 1005"> <p style="text-align: center;"><u>EXPANSION OPN. 02</u> (AFTER WELDING)</p> <p>STAGE-I EXPANDER : EXPN. 7 TO 39 MM STAGE-II EXPANDER : EXPN. 33 TO 65 MM STAGE-III EXPANDER : EXPN. 57 TO 88 MM PERCENTAGE THINNING = 3 TO 5 PERCENT.</p> </div> </div>	