



General Note: **BHARAT HEAVY ELECTRICALS LIMITED**

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(A Government of India Undertaking)
HIGH PRESSURE BOILER PLANT
PURCHASE DEPARTMENT - FOSSIL BOILERS
THIRUCHIRAPALLI - 620014
TAMILNADU (INDIA)

PHONE : 2574111
GRAMS : BHARATELEC
FAX NO: 2520719
E-mail :
Web :

429-002/A

Collective No.	Enquiry Date	Due Date For Quotation
1801601115	20.09.2016	12.10.2016
Please quote Enquiry No, Date and due date in all correspondences. This is only a request for quotation and not an order		

Item	Description	Unit	Quantity	Delivery Quantity	Schedule Date
10	A142114120003001 AIR DAMPER DRIVE (ADJUSTABLE DOUBLE ACTING TYPE) WITH CHARACTERISTIC SMART POSITIONER, DOUBLE AIR LOCK VALVE , AIR SET AND JUNCTION BOX. ALL MOUNTED AND FULLY PIPED UP AS PER THE SPECIFICATION TOS:005/REV.01	NO	1.000	1.00	31.12.16
General Note: 01. The Tender will be operated on TWO PART BID basis and you are requested to submit Techno-commercial bid and Price bids in separately in EPS. General procedure for obtaining Digital Signature and other procedures are detailed in Annexure-E. Offers thro other mode are not acceptable. 02. Please take note of Annexure-D (Pre-qualification criteria). The same will be considered for evaluation of your offer. The requisite documents shall be submitted along with techno-commercial offer for evaluation. 03. The supply shall be as per Specification BHEL specification TOS:005/Rev.01, TCI:317 for smart positioner & Pneumatic hook up Diagram (Drg No: 4-41-200-01972) attached with enquiry and please give pointwise confirmation for the same. 04. All Dimensional Drawings with unit weight to be submitted along with the offer. 05. The items covered in the enquiry are required for North Karanpura Aux project (Cust No: 1421). 06. The items are to be despatched to BHEL Trichy Stores on FOR /Destination basis and you are requested to quote the rates accordingly. 07. Specific confirmation is required for the Annexure -A (commercial terms and conditions) which is to be filled and submitted along with techno-commercial offer for evaluation.					

The offers should reach us 30 minutes before the time of opening of tenders.
The offers will be opened at 14.30 hrs on the due date of tender in the presence of tenderers who have submitted their offer and who may like to be present for the tender opening. Late and delayed offers are liable to be rejected.

Yours faithfully,
For **BHARAT HEAVY ELECTRICALS LIMITED**

MANAGER / PURCHASE
(FOSSIL BOILERS)
Materials Management / 801
BHEL, TIRUCHY - 620 014.



BHARAT HEAVY ELECTRICALS LIMITED

(A Government of India Undertaking)
HIGH PRESSURE BOILER PLANT
PURCHASE DEPARTMENT - FOSSIL BOILERS
THIRUCHIRAPALLI - 620014
TAMILNADU (INDIA)

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1801601115 / 20.09.2016

23505

08. Please take note of Annexure-B (loading factors for commercial deviations). The same will be applicable for evaluation of net cost to BHEL basis and is to be filled and submitted along with techno-commercial offer.

09. Special provision for MSE suppliers is applicable as per the Annexure-C. Vendor to submit the required documents as stipulated in Annexure-C for availing the same.

Enclosures:

- 01) General terms and Conditions
- 02) Annexure - A (Commercial terms & conditions).
- 02) Annexure - B (loading factors)
- 04) Annexure - C (Special provision for MSE vendors)
- 05) Annexure - D (Pre - Qualification requirement)
- 06) E-Procurement general Guidelines
- 07) Specifications:
 - a) TOS:005/REV.01
 - b) TCI:317 For Smart Positioner
 - c) Pneumatic Hook Up Diagram
- 08) Third Party Non-Disclosure agreement

"LD clause has to be confirmed without fail."

The bidder along with its associate / collaborators / sub-contractors / sub-vendors / consultants /service providers shall strictly adhere to BHEL fraud prevention policy displayed on BHEL website

<http://www.bhel.com> and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to their notice.

PR Links

Material.	PR.No	PR.Item.	Quantity	Acc. Assign	Customer Number
A142114120003001	115350527	00010	1.000	I3/1421-LU-090-1-41-200	I3/1421

list of suppliers

RFQ-5200005308

Open Tender Dummy Code

The offers should reach us 30 minutes before the time of opening of tenders.
The offers will be opened at 14.30 hrs on the due date of tender in the presence of tenderers who have submitted their offer and who may like to be present for the tender opening.Late and delayed offers are liable to be rejected.

Yours faithfully,
For BHARAT HEAVY ELECTRICALS LIMITED


MANAGER / PURCHASE
(FOSSIL BOILERS)
Yours faithfully,
Materials Manager
BHEL, THIRUCHY - 620 014.



An ISO 9001
Company

Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli-620 014, Tamil Nadu, India

Dept : PURCHASE-MATERIALS MANAGEMENT/BOI

ANNEXURE-A

ACCEPTANCE OF TECHNO - COMMERCIAL TERMS AND CONDITIONS BY THE BIDDERS

(This techno-commercial sheet should be duly filled and signed, and should be the part of Bid part no-I)

Description of the Items:		Supply of damper drive as per BHEL specification
Enquiry Ref:		1801601115-04 dated 20.09.2016
SI No.	Description	Vendor's confirmation
1	The tender will be operated on Two-Part Bid basis and the vendors are requested to submit both Techno-Commercial bid and Price Bids through e-procurement.	
2	Technical: Supply shall be as per BHEL's Specification attached with the enquiry.	
3	Firm Price: The quoted/Finalised rates shall be Firm till execution of the supplies.	
4	Price Basis: Materials are to be despatched to BHEL Trichy Stores after the inspection and clearance. Prices quoted should be inclusive packing & Forwarding charges. Freight & Insurance scope up to destination break up is to be clearly indicated in the price bid. Vendor to confirm the same.	
5	Payment terms: Payment term is 100% direct payment after 45 days from the date of receipt and acceptance of materials.	
6	Liquidated damages: Liquidated damages shall be 0.5% of the total order value per week or part thereof subject to a maximum of 10% of the total order value.	
7	Risk Purchase: If the supplier fails to deliver the goods within the delivery specified in the purchase order, BHEL will be entitled to terminate the contract and to purchase elsewhere at the Risk and cost of the seller either the whole of the goods or any part which the supplier has failed to deliver or despatch within the delivery period mentioned in the purchase order.	
8	Delivery Period: Delivery shall be 8 weeks from document approval.	
9	Validity: Price Validity of your offer shall be Minimum 120 days from the date of Techno-Commercial Bid opening.	
10	Guarantee: Guarantee clause 18 months from the date of supply or 12 months from the date of commissioning, whichever is earlier.	
11	In addition to above, vendor have to submit all the documents duly filled in "Supplier Registration Forms" through online (available in http://www.bheltry.co.in/ - On line Vendor Registration-Material Management). Duly filled in Supplier Registration Forms, along with all credentials and supporting documents, Certificate of Rating from D & B (Dun & Brad) or equivalent agencies (For Foreign Vendors), Financial Performance / Profit & Loss Account / Balance sheet for last three years etc. (With Techno-Commercial Bid). Availability of minimum manufacturing, handling, testing and measuring facilities, to be detailed are to be mentioned clearly. All the documents to be uploaded. Apart from qualifying the Techno-Commercial requirements of the enquiry, BHEL has the right for spot assessment of the facilities for evaluation, approval and for registration. Apart from online submission, Hard copy has to be forwarded to SM/SDC/MM/BHEL/TRICHY. Also vendor has to indicate the registration no in their offer. Further their offer will be subject to evaluation and approval by BHEL as permanent vendor.	

Date:

Signature with seal

ANNEXURE-B**Loading factors for the tender enquiry for requirement of Damper drive for North karanpura Aux project**

SI No.	BHEL Commercial terms	Vendor Confirmation to BHEL Commercial terms	Loading Criteria for Deviations
1	Payment terms: Payment term is 100% direct payment after 45 days from the date of receipt and acceptance of materials.		Any deviation in the above payment term will attract loading as mentioned below. “Base rate of SBI (as applicable on the date of bid opening. Techno-commercial bid opening in case of two part bids) + 6% shall be considered for loading for the period of relaxation sought by bidders.
2	Liquidated damages: Liquidated damages shall be 0.5% of the total order value per week of delay or part thereof subject to a maximum of 10% of the total order value.		Any deviation from the above LD clause, loading will be applied to the extent to which it is not agreed by the bidder (at offered value).
3.	Guarantee: Guarantee clause 18 months from the date of supply or 12 months from the date commissioning, whichever is earlier.		No deviation permitted and the deviated offers are liable for rejection.
	<u>Important Note:</u> i) Payment through Bank is not preferred. In case of Payment through Bank is opted by Supplier, BHEL prefers documents submission through bank with copy of LR and door delivery of Goods to Stores with Consignee copy attached. In this case Loading will be 3% on the offered value. ii) BHEL will evaluate the offers and consider the ranking after the loading is applied as referred above wherever deviations are observed. iii) LC/Advance payment will not be operated for indigenous vendors. Offers of indigenous vendors with payment term as LC/Advance payment are liable for rejection.		

ANNEXURE-C**Clause: Special provisions for Micro & Small Enterprises (MSE)**

1. In case MSE vendor participating in the tender quotes within the price band of L1+15%, they will be allowed to supply the complete package requirement subject to acceptance of L1 price by MSE vendor.
2. In case of more than one such MSE, the counter offering will be to the lowest quoted MSE vendor subject to fulfillment of Point No.1
3. MSE suppliers can avail the intended benefits only if they submit along with the offer, attested copies of either EM II certificate having deemed validity (Two years from the date of issue of acknowledgement in EM II) or valid NSIC certificate or EM II certificate along with CA certificate (Format enclosed) applicable for the year, certifying quantum of investment in plant and machinery within the permissible limit as per the act for relevant status (Micro or small) where the deemed validity of EM II is over. Date to be reckoned for determining the deemed validity will be the last date of technical bid submission. Non submission of such documents will lead to consideration of their bids at par with other bidders and MSE status of such suppliers shall be shifted to Non MSE supplier till the supplier submits these documents.

Annexure - I

Certificate by Chartered Accountant on letter head

This is to Certify that M/S
(hereinafter referred to as 'company') having its registered office at
is registered under MSMED Act 2006, (Entrepreneur
Memorandum No (Part-II) dtd:.....
Category: (Micro/Small)). (Copy enclosed).

Further verified from the Books of Accounts that the investment of the company as per the
latest audited financial year as per MSMED Act 2006 is as follows:

1. **For Manufacturing Enterprises:** Investment in plant and machinery (i.e. original cost
excluding land and building and the items specified by the Ministry of Small Scale Industries vide its
notification No.S.O.1722(E) dated October 5, 2006 :
Rs.....Lacs
2. **For Service Enterprises:** Investment in equipment (original cost excluding land and building and
furniture, fittings and other items not directly related to the service rendered or as may be notified under the MSMED
Act, 2006:
Rs.....Lacs

(Strike off whichever is not applicable)

The above investment of Rs.....Lacs is within permissible limit of
Rs.....Lacs forMicro / Small (Strike off which is not applicable)
Category under MSMED Act 2006.

Or

The company has been graduated from its original category (Micro/ Small) (Strike off which is not
applicable) and the date of graduation of such enterprise from its original category is
(dd/mm/yyyy) which is within the period of 3 years from the date of graduation of such
enterprise from its original category as notified vide S.O. No. 3322(E) dated 01.11.2013 published
in the gazette notification dated 04.11.2013 by Ministry of MSME.

Date:



(Signature)

Name -

Membership number -

Seal of Chartered Accountant

Annexure – D – Pre-Qualification Requirement (PQR)

- 1) Vendor shall be established manufacturer of Damper drive of round burner and have adequate engineering and manufacturing facilities and furnish technical backup documents.
- 2) Vendor shall have adequate testing facilities and shall carry out all inspection and tests as specified in the specification.
- 3) Proven track record is required. Minimum two end user certificates for the satisfactory operational performance of their equipment's supplied.
- 4) Vendor shall provide the manufacturing catalogue or general reference list for the offered damper drive along with offer.
- 5) Equipment supplied and commissioned reference list to be enclosed.
- 6) In case of ordering, the Vendor shall have the responsibility for the following
 - i) He should have the component replacement responsibility in case of defective / failure.
 - ii) Experts from Vendor's side shall associate in commissioning activities at site, if required.
 - iv) He should ensure the product performance during erection & commissioning and ensure performance guarantee.
- 7) In addition to above, vendor have to submit all the documents duly filled in "Supplier Registration Forms" through online (available in <http://www.bheltry.co.in/>- On line Vendor Registration-Material Management). Duly filled in Supplier Registration Forms, along with all credentials and supporting documents, Certificate of Rating from D & B (Dun & Brad) or equivalent agencies (For Foreign Vendors), Financial Performance / Profit & Loss Account / Balance sheet for last three years etc. (With Techno-Commercial Bid). Availability of minimum manufacturing, handling, testing and measuring facilities, to be detailed are to be mentioned clearly. All the documents to be uploaded. Apart from qualifying the Techno-Commercial requirements of the enquiry, BHEL has the right for spot assessment of the facilities for evaluation, approval and for registration.

Apart from online submission, Hard copy has to be forwarded to SM/SDC/MM/BHEL/TRICHY. Vendor has to indicate the registration no in their offer. Further their offer will be subject to evaluation and approval by BHEL as permanent vendor.

ANNEXURE-E – General Procedures for E-Procurement

BHEL Trichy has implemented e-Procurement (www.bheleps.buyjunction.in) and it is going to be the way of working in future.

The following are the benefits of e-Procurement Process.

1. Ensuring no offer is missed due to last minute submission, postal delays etc.
2. Reduced Tendering & ordering cycle time
3. Economical, smoother & speedy communication
4. Greater Transparency
5. Big step towards paperless procurement process, Minimal human error
6. No geographical barriers
7. Vendor gets alerts regarding issue of new tender enquiry, amendments, clarifications etc
8. Submission of offer from the comforts of their office from any location
9. on line clarifications
10. Direct Cost Savings such as reduced Paper costs, reduced printing costs, reduced mailing costs, reduced telephone costs and reduced fax costs.

BHEL has finalized the e-procurement service Provider

M/s mJunction services Limited, Kolkata

Godrej Water Side, 3rd Floor, Tower-1, Plot-V, Block - DP
Sector - V, Salt Lake, Kolkata-700091, West Bengal, INDIA.

Please get in touch with them immediately. The contact details of the service provider is given below:

- a. DHANARAJ.P email: panneer.dhanaraj@mjunction.in, Cell 9500199108
- b. HELPDESK email: eps.customercare@mjunction.in, Phone No: 033-66106426/6217/6013/6046/6176, 9163348283 / 9163348284 / 9163348285 / 9163348286 / 8584008116

The process of utilizing e-procurement necessitates usage of DSC (Digital Signature Certificate)(**Class 3- SHA2- 2048 BIT- SIGNING & ENCRYPTION**) and you are requested to procure the same immediately, if not presently available with you. Please note that only with DSC, you will be able to login the e-procurement secured site and take part in the tendering process. The contact details of the DSC Certifying Authority as given below

1	e-Mudhra	http://www.e-Mudhra.com	5	NIC	www.safescrypt.com
2	GNFC	www.ncodesolutions.com	6	Safescrypt	www.safescrypt.com
3	IDRBT	www.idrbtca.org.in	7	TCS	www.tcs-ca.tcs.co.in
4	MTNLTrustline	www.mtnltrustline.com			

Vendors are requested to go through seller manual available on www.bheleps.buyjunction.in

II.PROCEDURE FOR ENTERPRISE PROCUREMENT SYSTEM (EPS)

a. Interested bidders / Suppliers shall submit their offer through e-Procurement mode at <https://bheleps.buyjunction.in> Offers in any other mode will not be accepted. For Enterprise Procurement System (EPS) Bidders/Suppliers are requested to follow these steps.

REQUIREMENTS:

1. A PC with Internet connectivity.
2. DSC (Digital Signature Certificate) (Class 3- SHA2- 2048 BIT- SIGNING & ENCRYPTION)
3. The site is best viewed in Internet Explorer 9.0. If you are using Internet Explorer 10 or above then enable compatibility view available under Tools menu
4. Install Java 1.8 Update 67/72/79/77 (32 OR 64 Bit)

DIGITAL SIGNATURE REQUIREMENT:

Suppliers interested for registration for BHEL Open Tenders should have a valid DSC (Digital Signature Certificate) before Proceeding forward for Registration. Herein a Valid DSC refers to an Active and unexpired Signing and Encryption Certificate, with specification Class III SHA 2 2048 bit.

UNREGISTERED SUPPLIER IN EPS:

Procedure for Online Registration in EPS for Open Tender Suppliers for BHEL

Unregistered Supplier: Supplier visits EPS at <https://bheleps.buyjunction.in>

Please follow the below steps for registration

1. Click Register Button (Top of the Screen)
2. Please input your organization PAN No (in case of Indian supplier) or click “Foreign” in case you are an overseas Supplier.
3. Click on INTERESTED Button against the respective BHEL Unit
4. Key in your desired login id (Login Code should be 8 - 24 characters in length and can only use numeric values) If you have registered by keying in PAN No. then your desired login id will be prefixed by “OTI”, In case of overseas suppliers it will be prefixed with “OTF”
5. Fill in the other details.
6. Fill in the Captcha code and click next
7. Register your Signing certificate and click next
8. Select atleast one procurement category you may be dealing in.

Once the above steps are completed, your profile will be activated by mjunction within 2 business hours. After registering follow the steps provided in “For Registered Supplier” to view RFQ.

In case of any assistance, please call the following nos for support: 033-6601 1717 (From 9:30am to 5:30pm)

NB:-

1 -- BHEL Administrator or user will have no role for approving Registration and Open Tenders and DSC for Any supplier who has registered himself from the front END which is in case of OT.

FOR REGISTERED SUPPLIER IN EPS:

- a. Supplier visits EPS home page
- b. Supplier signs in with their user id and password
- c. Selects the RFQ Code and views it.
- d. Attaches themselves to the RFQ by clicking the interested button
- e. Supplier fills the bid template and makes necessary attachments
- f. Supplier submits their bid by clicking CONFIRM.

In case of any assistance, please call the following Nos for support:

033-6601 1717 (From 9:30am to 5:30pm)

THIRD PARTY NON-DISCLOSURE AGREEMENT

I, _____, on behalf of the _____ (Name of Company), acknowledge that the information received or generated, directly or indirectly, while working with BHEL, Trichy on contract is confidential and that the nature of the business of the BHEL, Trichy is such that the following conditions are reasonable, and therefore:

I warrant and agree as follows:

I, or any other personnel employed or engaged by our company, agree not to disclose, directly or indirectly, any information related to the BHEL, Trichy Without restricting the generality of the foregoing, it is agreed that we will not disclose such information consisting but not necessarily limited to:

- Technical information: Methods, drawings, processes, formulae, compositions, systems, techniques, inventions, computer programs/data/configuration and research projects.
- Business information: Customer lists, project schedules, pricing data, estimates, financial or marketing data,

On conclusion of contract, I, or any other personnel employed or engaged by our company shall return to BHEL, Trichy all documents and property of BHEL, Trichy, including: drawings, blueprints, reports, manuals, computer programs/data/configuration, and all other materials and all copies thereof relating in any way to BHEL, Trichy's business, or in any way obtained by me during the course of contract. I further agree that I, or any others employed or engaged by our company shall not retain copies, notes or abstracts of the foregoing.

This obligation of confidence shall continue after the conclusion of the contract also.

I acknowledge that the aforesaid restrictions are necessary and fundamental to the business of the BHEL, Trichy and are reasonable given the nature of the business carried on by the BHEL, Trichy I agree that this agreement shall be governed by and construed in accordance with the laws of country.

I enter into this agreement totally voluntarily, with full knowledge of its meaning, and without duress.

Dated at _____, this ____ day of _____, 20__.

Name
Company
Signature



SPECIFICATION FOR ACTUATOR ASSEMBLY

TOS: 005/Rev: 01
Sheet No. 1/2

1. Type : Double acting piston type rotary actuator with stroke adjustment facility on one end of the stroke, adjustable between 30 to 60° opening and shall have provision to lock / stop the stroke at the above specified range. With the effect the damper will be able to close fully and will be able to be opened to an angle anywhere between 30 and 60°.
2. Application : To actuate the air damper blades of a round burner. The actuator shall be suitable for mounting directly on the damper shaft.
3. Duty conditions
- a) Ambient temperature : 85° C
- b) Actuating Medium : Instrument air at 4 kg/cm² (g) min. air pressure
- c) Maximum air Pressure : 5 kg/cm² (g)
- d) Actuator Sizing : Shall be for air pressure of 4 kg/cm² (g)
- e) Actuator Torque at min. air Pressure : 60 kg- m
4. Accessories required : Air damper drive (adjustable double acting type) with charectarisable Smart positioner, Double air lock valve, Position transmitter, Air set and junction box.
- a) Limit Switch : Shall have DPDT contacts in each switch. Each actuator shall have one switch for open indication and one switch for closed indication. The housing for the limit switch shall be explosion proof. The contact rating for the switch shall be 240V AC, 10Amps. Limit switch housed in separate housing or common housing with an operated switch is acceptable. The open limit switch should be adjustable between 30 to 60° strokes.
- b) Air set and Air lock valve shall be of reputed make with 1/4" NPT (F) ports.

	Name	Signature	Date
Prepared	Srinivas		07.03.09
Checked	Srinivas arugula		07.03.09
Approved	Farooq Basha		07.03.09

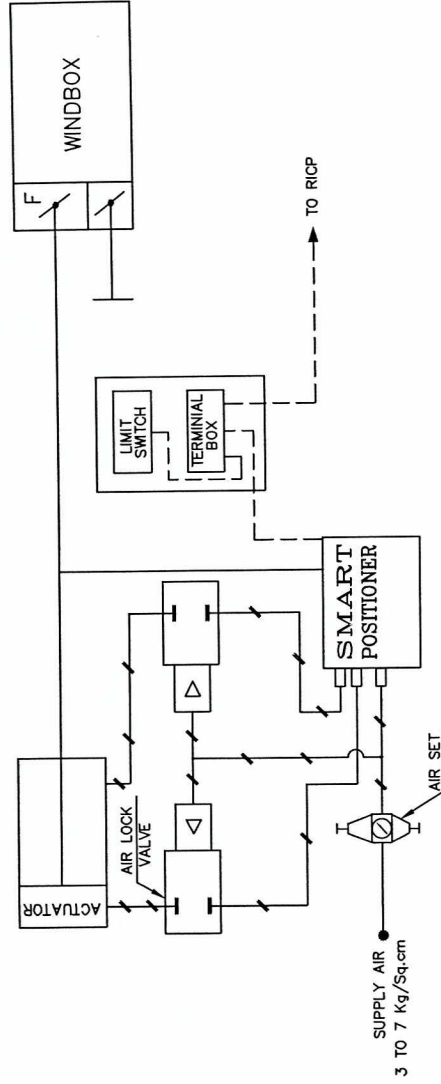
	SPECIFICATION FOR ACTUATOR ASSEMBLY	TOS: 005/Rev: 01 Sheet No. 2/2
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5. Along with the offer the vendor shall submit the following details.
 - a) Complete arrangement drawing showing all the above items.
 - b) Catalogues/drawings for the actuator, Solenoid valve, Limit switch, air set and air lock valve.
 - c) Mounting/fixing details of actuator on damper shaft / burner body.
6. O&M manuals: Five sets of O&M manuals shall be supplied immediately after ordering
7. Quality plan shall be submitted for approval.
8. Following works test certificates shall be supplied for:
 - a). Dimensional Check
 - b). Proper actuator working with 4 kg/cm² (g) air pressure
 - c). Torque measured
 - d). Adjustment for stroke between 30 and 60°.
 - e). Verification of make / model no. Of Solenoid valve / Limit switch/ Air set
 - f). Class of Insulation for Solenoid valve.

	Name	Signature	Date
Prepared	Srinivas		07.03.09
Checked	Srinivas arugula		07.03.09
Approved	Farooq Basha		07.03.09

DRAWING NO: 4-41-200-01972

FOR TOLERANCES OF UNTOLERANCED
DIMENSIONS DURING MANUFACTURE
REFER PLANT STD.NO TP 023 0299



LEGEND

--- SIGNAL LINE.

--- INSTRUMENT AIR LINE

NOTE:

1. THIS ACTUATOR WILL BE IN STAY PUT
IN CASE OF LOSS OF SUPPLY AIR.

TYPE OF PRODUCT
OR NAME OF
CUSTOMER/PROJECT



Bharat Heavy Electricals Ltd
UNIT: HIGH PRESSURE BOILER PLANT
TIRUCHIRAPALLI - 620014

DRN
CHD
APPD

NAME
AJEET
M. ANBAZHAGAN
M. THANDAPANI

SIGNATURE

DATE
02/05/2014
02/05/2014
02/05/2014

REF TO ASSY / OLD DWG

WEIGHT (Kg)
-

SCALE
N.T.S

PROJECTION
ALL
DIMENSIONS
ARE IN MM

DEPT
PE(FB)
CODE 123

REV
01

DATE
01

ALTERED :
CHD & APPD:

ZONE

DRAWING NO :

4-41-200-01972

REV

00

PNEUMATIC HOOK UP DIAGRAM

CAUTION: The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.

9

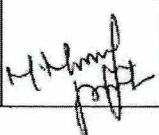
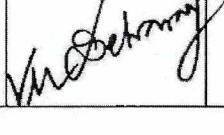
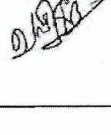
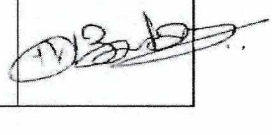
Bharat Heavy Electricals Limited
High Pressure Boiler Plant , Tiruchirappalli-620 014.

TECHNICAL DELIVERY CONDITIONS
FOR SUB - DELIVERY COMPONENTS OF
CONTROLS AND INSTRUMENTATION

Specification No. TCI : 317

Page 01 of 04

TECHNICAL SPECIFICATION
OF
SMART POSITIONER

Rev. No.	Date	Description	Prepared	Reviewed		Approved
				Engineering	QAC	
00 - 03	17-03-2015	Earlier Revisions	-sd-	-sd-	-sd-	-sd-
04	24-07-2015	Specification revisited				

Sl. No	Technical Description/Requirement	
1	SITE CONDITIONS :- Altitude above Sea Level Atmosphere Relative humidity Operating temperature	500 Meters Tropical, Dusty, Windy & Heavily polluted atmosphere 100 % -30 to 80 deg C
2	Make of the SMART positioner	Vendor to specify.
3	Type of Input	4-20 mA, 24 V DC, 2 wire system (Loop powered from DCS)
4	Operational signal range	3.6 mA - 21 mA (4-20 mA). Split range operation shall also be possible.
5	Voltage	12 to 36 V DC
6	Input impedance	Vendor to specify
7	Supply Air pressure	3 - 7 kg/cm ²
8	Air Capacity	Vendor to match with the requirement of the actuator.
9	Sensitivity, Characteristic Deviation	Sensitivity : $\leq 0.1\%$ of span, Characteristic deviation : $\leq 0.5\%$ of span
10	Type of Acting (Direct/Reverse)	Vendor to match with the requirement of the actuator.
11	Flow Characterization	SMART positioner shall be compatible to fit valve characteristic curves, Linear/Equal percentage etc.
12	Stroke time	Vendor to match with the requirement of the actuator.
13	No. of pneumatic outputs (Single/Double)	Vendor to match with the requirement of the actuator.
14	Pneumatic Process Connection	1/4" NPT (F)

Sl. No	Technical Description/Requirement	
15	Communication by Hart Protocol	SMART positioner shall be compatible for Remote calibration & Diagnostics using Hart Management System.
16	Calibration	SMART positioner shall be compatible for Auto Start with self calibration, Remote calibration from Hart Management System & manual calibration using push buttons available on the positioner.
17	Position feed back	4-20mA position feedback output signal.
18	Electrical Cable entry	Side or bottom entry to avoid water ingress.
19	Protection Class	IP 65
20	Action required during 4 to 20 mA control signal failure.	SMART positioner shall be compatible for achieving Fail Open, Fail Close & Stay put (Fail freeze) functions to be configured at site.
21	Accessories	For Supply & output pressure, gauges shall be provided on the positioner.
22	EMC Compliance	SMART positioner shall conform to EMC Compliance as per international standards IEC/EN. 61000-4-2/3/6/12
23	Influence of Temperature rise on SMART Positioner	≤ 0.01 % per deg C.
24	Diagnostic Features	1. Soft Open / Close limit switch output. 2. Fault. 3. Manual/Auto operation indication. 4. Alarm on Power air failure. 5. Travel/ Stroke counter. 6. Diagnosis of leakage in actuator. 7. On line partial closure test (as per requirement of valve)

Sl. No	Technical Description/Requirement	
		8. Valve signature analysis 9. Valve friction/jamming detection 10. Step Response Test
25	In built Operator panel	The positioner shall have a display with push buttons for configuration and for read out. The same shall be Password protected/Hardware lock.
26	Valve Mounting Assembly	Required mounting accessories & fasteners for mounting the positioner on valve actuators shall be taken care of by Valve vendor.
27	Test reports & Catalogues	1. Test Certificates as per Manufacturer's Standard. 2. Valve Signature test reports, SMART positioner catalogues & O&M manuals. 3. The above documents 1 & 2 shall be submitted to BHEL (Soft Copies) for reference and also a copy of the same shall be sent to site along with the consignment.