General Note: **BHARAT HEAVY ELECTRICALS LIMITED**
(A Government of India Undertaking)
HIGH PRESSURE BOILER PLANT
PURCHASE DEPARTMENT - FOSSIL BOILERS
THIRUCHIRAPALLI - 620014
TAMILNADU (INDIA)

PHONE : 2577359
GRAMS : BHARATELEC
FAX NO: 2520719
E-mail :
Web :

429-002/A

OFFICE COPY

Collective No.	Enquiry Date	Due Date For Quotation
1801600055	11.01.2016	12.02.2016

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 Schedule Quantity	Delivery Schedule Date
10	L068312486705001 RECIRCULATION CONTROL VALVE Tag NO : 01HAG30 AA451	SET	2.000	2.00	30.04.16
20	L068382498808001 GLAND PACKING-RECIRCULATION CONTROL VALV	SET	2.000	2.00	30.04.16
30	L068382498808002 GASKET -RECIRCULATION CONTROL VALVE	SET	2.000	2.00	30.04.16
40	R00068300048 Valve trim for Recirculation control valve "Valve trim (including cage, plug, stem, seat rings, guide bushings etc) for Recirculation control valve as per Matl Code-L068312486705001."One Set = 1 Valve Requirement.	SET	1.000	1.00	30.04.16
50	R00068300049 Packing & Gasket for Recirculation control valve "Packing & Gasket for Recirculation control valve as per Matl Code-L068312486705001."	NO	5.000	5.00	30.04.16
60	R00068300050 Actuator Diaphragm for Recirculation control valve "Actuator Diaphragm for Recirculation control valve as per Matl Code-L068312486705001."	NO	1.000	1.00	30.04.16
70	R00068300051 O-rings for Recirculation control valve "O-rings for Recirculation control valve as per Matl Code-L068312486705001."	NO	5.000	5.00	30.04.16
80	R00068300052 Feedback linkage for Recirculation control valve "Feedback linkage for Recirculation control valve as per Matl	NO	1.000	1.00	30.04.16

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)

K.UDAYA KUMAR
Sr. Engineer / Purchase
Material Management / FB
BHEL TRICHY - 620 014.

BHARAT HEAVY ELECTRICALS LIMITED

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HIGH PRESSURE BOILER PLANT
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TAMILNADU (INDIA)

1801600055 / 11.01.2016				23505	
	Code-L068312486705001."				
90	R00068300053	LOT	1.000	1.00	30.04.16
	Pressure gauges for Recirculation control valve "Pressure gauges of all types, range, make, rating etc for Recirculation control valve as per Matl Code-L068312486705001." One Lot = 1 Valve Requirement.				
100	R00068300054	LOT	1.000	1.00	30.04.16
	Air Filter Regulator for Recirculation control valve "Air Filter Regulator for Recirculation control valve as per Matl Code-L068312486705001." One Lot = One Valve Requirement.				
110	R00068300055	LOT	1.000	1.00	30.04.16
	I-to-P Converter for Recirculation control valve "I-to-P Converter for Recirculation control valve as per Matl Code-L068312486705001." One Lot = One Valve Requirement.				
120	R00068300056	LOT	1.000	1.00	30.04.16
	Position transmitter for Recirculation control valve "Position transmitter for Recirculation control valve as per Matl Code-L068312486705001." One Lot = One Valve Requirement.				
130	R00068300057	LOT	1.000	1.00	30.04.16
	Limit Switch for Recirculation control valve "Limit Switch for Recirculation control valve as per Matl Code-L068312486705001." One Lot = One Valve Requirement.				
140	R00068300058	LOT	1.000	1.00	30.04.16
	Solenoid Valves for Recirculation contro "Solenoid Valves Assembly with coil for Recirculation control valve as per Matl Code-L068312486705001." One Lot = One Valve Requirement.				
150	R00068300059	LOT	1.000	1.00	30.04.16
	Air lock relay for Recirculation control valve "Air lock relay for Recirculation control valve as per Matl Code-L068312486705001." One Lot = One Valve Requirement.				
160	R00068300060	LOT	1.000	1.00	30.04.16

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**

12/1/16

MANAGER (MATERIALS)
(FOSSIL BOILERS)
Yours faithfully,

K. UDAYAKUMAR
Sr. Engineer / Purchase
Material Management / FB
BHEL, TRICHY - 620 014.

BHARAT HEAVY ELECTRICALS LIMITED

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

1801600055 / 11.01.2016					23505
	Smart Positioner for Recirculation control valve "Smart Positioner for Recirculation control valve as per Matl Code-L068312486705001." One Lot = One Valve Requirement.				
170	R00068300061	SET	1.000	1.00	30.04.16
	Pneumatic Power Cylinder for Recirculati "Pneumatic Power Cylinder for Recirculation control valve as per Matl Code-L068312486705001." One Set = 1 Valve Requirement.				

General Note:

1) Please fill up the commercial terms annexure A enclosed and submit along with the offer for evaluation.

2) Please give point wise confirmation to our specification and fill all the columns in the datasheet.

3) The offer to be submitted in two part bid system:
a) Technical offer with commercial terms and b) Price bid separately.

4) The materials are to be despatched to Neyveli site, Tamilnadu state. Vendors are requested to quote on FOR/Destination basis including freight & insurance charges to their account.

5) The tender will be considered as a single package for evaluation & ordering.

6) Vendor to furnish unit weight and dimensional drawings of the valves at the time of the offer itself.

7) Vendor shall follow applicable painting schedule for this project.

8) While calculating the Quantity of Items for Commissioning spares, vendor shall round the number to the nearest higher whole number.

9) Suitability of Mandatory spares to the main supply shall be confirmed by vendor in the quotation.

10) Complete set of documents/drawing approved by Main engineering is applicable for spares supply and to be followed for the Mandatory spares also. No separate approval is required for spares.

11) Vendor to submit clear technical offer indicating the scope of supply for each items with BHEL material code and set details indicating applicable items with applicable description, Specification and quantity and also should clearly indicate not applicable items.

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**

12/1/16

MANAGER (FOSSIL BOILERS)

Yours faithfully,

K. UDAYAKUMAR
Sr. Engineer / Purchase
Material Management / FB
BHEL, TRICHY - 620 014.

BHARAT HEAVY ELECTRICALS LIMITED

(A Government of India Undertaking)
HIGH PRESSURE BOILER PLANT
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12) All filled up data sheets, drawings, calculations for Cv, Noise, Valve outlet velocity, Actuator sizing, Lift % vs Cv %, hook up & UB
diagram and catalogues are to be submitted along with the offer.

13) Optional price for Cv type test is to be quoted.

14) Enquiry sl. No: 10 - Main supplies
,,Enquiry sl. No: 20 - 30 - Commissioning spares
,,Enquiry sl. No: 40 - 170 - Mandatory Spares

15) Main supplies and commissioning spares to be dispatched to Neyveli site, Tamilnadu state. (Enquiry Sl. No: 10 to 30).

Mandatory spares shall be dispatched to BHEL / Trichy - Tamilnadu State (Enquiry Sl. No : 40 to 170)

16)Vendor shall comply the Pre-qualification requirement as per annexure-B

17) Special provision for MSME vendors are as per Annexure-C

18)Vendor have to submit all the documents duly filled in "Supplier Registration Forms" through online (available in http//www.bheltry.co.in/- Online 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) sheet 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.

19) The tenders may be addressed to the following address:

The Tender Opening Cell / MM Room No: 26,
Building 24, Ground Floor
Bharat Heavy Electricals Limited
TIRUCHIRAPALLI 620014

In case personal delivery of the offer, it shall be dropped into the respective box kept in Room No: 26, after duly entering the data in the system.

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**

V. UDAYA KUMAR
MANAGER / PURCHASE
(FOSSIL BOILERS)
Sr. Engineer / Purchase
Material Management / FB
BHEL, TRICHY - 620 014.

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

1801600055 / 11.01.2016 23505

Offers will be accepted only up to 14.00 Hrs on the due date. Therefore, vendors shall ensure to submit the offers well before this time. All due date extension requirements should be addressed to the respective Purchase mail IDs. All the due date extension requests from vendors will be considered only up to 48 hours before the due date and time.

Vendors are requested to avoid submission of offers through e mail / fax. In case of any unavoidable situation, offers shall be sent through e mail to the following mail ID only tender_cell@bheltry.co.in.

As tenders are being opened by Common Tender Opening Cell, offer covers should be sealed with tenderers distinctive seal and super scribed with correct Tender No. item of supply and due date of opening.

The offers will be opened at 14.30 hrs on the due date of the 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.

Enclosures:

1) General Terms and Conditions (Annexure-A).
2) Pre-Qualification requirements (PQR) - Annexure-B
3) Special provision for MSME vendors- Annexure -C
4) Standard Quality Plan:SQP:SD:06/Rev 00 dt 14.09.2015
5) PBG format with Bank list
6) Price / unprice format
7) Data sheets for Recirculation control valve-2 sheets
8) Specification for Block & Control valves -5 sheets
9) Contract specification for control valves & accessories -12 sheets
10) Pneumatics actuator wiring diagram -1 sheet
11) Smart positioner specification requirement -4 sheets
12) Check list for SH/RH Block/Control valves -1 sheets

"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.	Quanity	Acc. Assign	Customer Number
L068312486705001	114262962	00010	1.000	U5/0683-LU-350-1-24-867	U5/0683
L068312486705001	114262963	00010	1.000	U5/0684-LU-350-1-24-867	U5/0684

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,

K. UDAYAKUMAR
Sr. Engineer / Purchase
Material Management / FB
BHEL, TRICHY - 620 014.

BHARAT HEAVY ELECTRICALS LIMITED

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

1801600055 / 11.01.2016 23505

Material.	PR.No	PR.Item.	Quanity	Acc. Assign	Customer Number
L068382498808001	114262966	00010	1.000	U5/0683-SY-611-8-24-988	U5/0683
L068382498808001	114262967	00010	1.000	U5/0684-SY-611-8-24-988	U5/0684
L068382498808002	114262966	00020	1.000	U5/0683-SY-611-8-24-988	U5/0683
L068382498808002	114262967	00020	1.000	U5/0684-SY-611-8-24-988	U5/0684
R00068300048	114283123	00010	1.000	0073009773/297002	U5-0683
R00068300049	114283125	00010	5.000	0073009773/298002	U5-0683
R00068300050	114283127	00010	1.000	0073009773/299002	U5-0683
R00068300051	114283129	00010	5.000	0073009773/300002	U5-0683
R00068300052	114285211	00010	1.000	0073009773/301002	U5-0683
R00068300053	114285213	00010	1.000	0073009773/302002	U5-0683
R00068300054	114285215	00010	1.000	0073009773/303002	U5-0683
R00068300055	114285217	00010	1.000	0073009773/304002	U5-0683
R00068300056	114285219	00010	1.000	0073009773/305002	U5-0683
R00068300057	114285221	00010	1.000	0073009773/306002	U5-0683
R00068300058	114285223	00010	1.000	0073009773/307002	U5-0683
R00068300059	114285225	00010	1.000	0073009773/308002	U5-0683
R00068300060	114285227	00010	1.000	0073009773/309002	U5-0683
R00068300061	114285229	00010	1.000	0073009773/323002	U5-0683

list of suppliers

RFQ-5200004611
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**

12/1/16

MANAGER / PURCHASE
(FOSSIL BOILERS)
Yours faithfully,

K. UDAYA KUMAR
Sr. Engineer / Purchase
Material Management / FS
BHEL, TRICHY - 620 014.

An ISO 9001
Company

Bharat Heavy Electricals Limited
(High Pressure Boiler Plant)
Tiruchirappalli-620 014, Tamil Nadu, India
Dept: MATERIALS MANAGEMENT/BOI

ANNEXURE-A General Terms and Conditions (IMPORT VENDOR)

ACCEPTANCE OF TECHNO - COMMERCIAL TERMS AND CONDITIONS BY THE BIDDERS

(To be Filled and submitted along with techno commercial offer for evaluation and to consider for Bid opening)

Description of the Equipment:	**Recirculation Control Valves, CS & MS**	
Project	**Neyveli (0683-0684)**	
BHEL Tender No. & Date	**1801600055/14 dt 11.01.2016**	
Sl. No.	**Terms and conditions**	**Vendor's confirmation**
1	**Technical:** Supply shall be as per enclosed BHEL's Respective Specification.	
2	**Firm Price:** The quoted / finalised rates shall be Firm till execution of the supplies. Offer with PVC clause will not be considered.	
3	The tender will be operated on two part bid basis and you are requested to submit techno commercial bid and price bid in separate sealed cover put together in a single cover.	
4	**Delivery term:** Offer shall be submitted on CFR Chennai Port / INDIA basis. It is requested to indicate the Freight amount separately as per Price / Unpriced format attached.	
5 (a)	**Payment terms:** BHEL Payment term is 100% payment on CAD basis after 45 days from the date of receipt of documents at BHEL bank along with 10% PBG valid for the Guarantee / Warranty Period. Respective bank charges to respective account. Along with	
5 (b)	**Loading Criteria :** **Payment Terms:** Any deviation in the BHEL payment terms will attract loading as per below. 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. i) In the case of Usance LCs the loading will be considered @ 1.5% on the offered Value. ii) For LC at sight the loading will be considered @ 3.5% on the offered Value.	

	iii) Normally CAD at sight and Confirmed LCs are liable for rejection BHEL will evaluate the offers and consider the ranking after the loading is applied as referred above wherever deviations are observed.	
6 (a)	**Liquidated damages:** Delivery of the goods specified in the purchase order should be made within the time prescribed. Failure to dispatch the materials in the time as per the delivery quoted in our Purchase Order would make the supplier liable to an un-conditional LD at the rate of ½% of the value of goods for each week of delay subject to a maximum of 10% of the total ordered Purchase Order value on part there off.	
6 (b)	**Loading Criteria** **LD / Penalty:** Any deviation on BHEL LD / Penalty clause, loading (Basic material Value) will be applied to the extent to which it is not agreed by the bidder.	
7 (a)	**Guarantee / Warranty Period:** Guarantee clause 24 months from the date of supply or 18 months from the date of actual put in use / Commissioning, whichever is earlier.	
7 (b)	**Loading Criteria:** **Guarantee / Warranty Period:** No Deviation is permitted. If still vendor offered any deviation on the Guarantee / warranty period leads to rejection of offer.	
8	**Performance Bank Guarantee:** BHEL require a performance Bank Guarantee to a value of 10% of supply valve covering the guarantee period. The PBG shall be in BHEL format (Format attached) which is to be opened in any one of the first class India banks. All banks charges shall be to vendor account only. If still vendor offered any deviation on PBG leads to rejection of offer.	
9	**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.	
10	**Delivery Period:** 20 Weeks from the Data sheet approval by BHEL / Customer	
11	**Validity:** 120 days minimum from techno commercial bid opening (Part-1)	
12	Vendor shall quote as per attached Price and Unprice Schedule format only.	

13	**Package:** Total requirement will be considered as package for evaluation and ordering of project wise basis.	
14	**O & M manuals:** BHEL require 1 sets of printed O & M manuals with 3 soft copies in CD-ROM at no cost to be sent to BHEL/ Trichy and 3 sets of printed O &M manuals to be sent along with valves directly to site.(for each boiler)	
15	**Repair & replacements:** The Purchaser at his option 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 time stipulated as aforesaid or if the same were not available, the best and the nearest available substitute therefor. The supplier shall be liable for any loss which the purchaser may sustain by reason of such risk purchases in addition to penalty as per LD clause.	
16	Please inform the Net , Gross weight , Size (L x B x H) of the consignment	
17	**Inspection and testing requirements**: Inspection and testing requirements are to be carried out as per the specification and BHEL /Customer approved QAP and all test certificates are to be submitted in complete set as indicated in our specification / QAP.	
18	For Evaluation, exchange rate (TT selling rate of SBI) as on scheduled date of tender opening (part –I bid in case of two part bid) shall be considered.	
19	Test certificate shall be submitted prior to despatch for our review and approval. Shipment shall be made only after obtaining despatch clearance from BHEL	
20	In case of order, Documents (Drawings, Data sheet & Quality plan in triplicate) shall be submitted within two weeks from the receipt of order	
21	Vendors who are quoting other than the approved manufacturing locations will be treated as unsolicited offer and will not be considered for evaluation and lead to offer rejection.	
22	Neyveli 2 x 500 MW comes under Mega power project category. Excise Duty / Customs Duty is exempted against the applicable documents for Main supply.	
19	MSME Clause : 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. In case of more than one such MSE, the counter offering will be to the lowest quoted MSE vendor subject to fulfilment of Point No.1 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	
20	Documents are to be submitted along with technical bid (Part-1) 01. Covering letter 02. Unpriced offer as per BHEL format 03. Filed technical specification 04. Filed BHEL Terms and condition sheet 05. Filed Pre-Qualification requirement (PQR) along with supporting documents 06. Catalogue's 07. MSME Documents (If applicable) 08. Vendor registration documents Documents are to be submitted along with Price bid (Part-2) 01. Priced offer as per BHEL format Note: All the pages of documents are to be signed and stamped by authorized signatory of the company.	
21	Vendor who are not registered with BHEL –Trichy for supply of valves as a permanent vendor, those vendors are requested to submit the vendor registration through online and submit the registration application number along all the necessary documents. (available in http//www.bheltry.co.in/- Online Vendor Registration- Material Management) Note : Vendor have to submit all the documents duly filled in "Supplier Registration Forms" through online (available in http//www.bheltry.co.in/- Online 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) sheet 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.	

Bharat Heavy Electricals Limited
(High Pressure Boiler Plant)
Tiruchirappalli-620 014, Tamil Nadu, India
Dept: MATERIALS MANAGEMENT/BOI

An ISO 9001 Company

ANNEXURE-A –General Terms and Conditions (INDIGENOUS VENDOR)

ACCEPTANCE OF TECHNO - COMMERCIAL TERMS AND CONDITIONS BY THE BIDDERS
(To be Filled and submitted along with techno commercial offer for evaluation and to consider for Bid opening)

Description of the Equipment:	**Recirculation Control Valves, CS & MS**
Project	**Neyveli (0683-0684)**
BHEL Tender No. & Date	**1801600055/14 dt 11.01.2016**

Sl. No.	Terms and conditions	Vendor's confirmation
1	**Technical:** Supply shall be as per enclosed BHEL's Respective Specification.	
2	**Firm Price:** The quoted / finalised rates shall be Firm till execution of the supplies. Offer with PVC clause will not be considered.	
3	The tender will be operated on two part bid basis and you are requested to submit techno commercial bid and price bid in separate sealed cover put together in a single cover.	
4	**FOR Basis:** The quote shall be on FOR project / BHEL-Trichy destination basis as indicated in enquiry, inclusive of Packing, forwarding, Freight & Transit Insurance also to yours account. Please quote Lumpsum charge for freight and insurance. If vendor passing transit insurance under BHEL scope. Offer will be loaded 0.065% of (Basic material value + ED + Forwarding & Packing + Freight charge). Main Supply along with Commissioning spares – Neyveli Project site / Tamilnadu Mandatory Spares – BHEL Trichy / Tamilnadu	
5 (a)	**Payment terms:** 100% direct payment after 45 days against site acknowledgement LR copy along with 10%PBG valid for the Guarantee / Warranty period.	
5 (b)	**Loading Criteria :** **Payment Terms:** Any deviation in the BHEL payment terms will attract loading as per 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". Payment through bank is not acceptable. If still demanded by vendor, loading will be 3% on the offered material value. If the Payment term is 90% direct payment after 45 days from the date of dispatch against submission of dispatch documents and balance 10% against site acknowledgement. For this option a loading of 2% on the 90% of the offered materials value shall be made. LC will not be operated for Indigenous vendors. Offers with payment terms as LC from indigenous vendors will be rejected.	
6 (a)	**Liquidated damages:** Delivery of the goods specified in the purchase order should be made within the time prescribed. Failure to dispatch the materials in the time as per the delivery quoted in our Purchase Order would make the supplier liable to an un-conditional LD at the rate of ½% of the value of goods for each week of delay subject to a maximum of 10% of the Purchase Order value on part there off.	
6 (b)	**Loading Criteria** **LD / Penalty:** Any deviation on BHEL LD / Penalty clause, loading (Basic material Value) will be applied to the extent to which it is not agreed by the bidder.	
7 (a)	**Guarantee / Warranty Period:** Guarantee clause 24 months from the date of supply or 18 months from the date of actual put in use / Commissioning, whichever is earlier.	
7 (b)	**Loading Criteria:** **Guarantee / Warranty Period:** No Deviation is permitted. If still vendor offered any deviation on the Guarantee / warranty period it may leads to rejection of offer.	
8	**Performance Bank Guarantee:** BHEL require a performance Bank Guarantee to a value of 10% of supply valve covering the guarantee period. The PBG shall be in BHEL format (Format attached) which is to be opened in any one of the first class India banks. All banks charges shall be to vendor account only. If still vendor offered any deviation on PBG leads to rejection of offer.	
9	**Taxes & Duties:** All Taxes, Duties, Service Taxes etc. payable as extra to the quoted price should be specifically stated in offers along with CST & TIN No / Tariff No. etc., failing which the purchaser will not be liable for payment of such Taxes and Duties. Our TIN No. 33243560005, TNGST No. 3560005, CST. No. 239383 Dt. 11-06-1991 & BHEL ECC No. AAACB4146PXM012, Assessment circle Tiruverambur.	

10	**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.	
11	**Delivery Period:** 24 Weeks from the Data sheet , QP approval by BHEL / Customer	
12	**Validity:** 120 days minimum from techno commercial bid opening (Part-1)	
13	Vendor shall quote as per attached Price and Unprice Schedule format only.	
14	**Package:** Total requirement will be considered as package for evaluation and ordering of project wise basis.	
15	**O & M manuals:** BHEL require 1 sets of printed O & M manuals with 3 soft copies in CD-ROM at no cost to be sent to BHEL/ Trichy and 3 sets of printed O &M manuals to be sent along with valves directly to site.(for each boiler)	
16	**Repair & replacements:** Within the guarantee period vendor has to replace / rectify the defective/ damaged items on free of cost within a reasonable time of reporting from our end.	
17	Vendors who are quoting other than the approved manufacturing locations will be treated as unsolicited offer and will not be considered for evaluation and lead to offer rejection.	
18	Neyveli 2 x 500 MW comes under Mega power project category. Excise Duty / customs Duty is exempted against the applicable documents for Main supply only.	
19	MSME Clause : 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. In case of more than one such MSE, the counter offering will be to the lowest quoted MSE vendor subject to fulfilment of Point No.1 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	
20	Documents are to be submitted along with technical bid (Part-1) 01. Covering letter 02. Unpriced offer as per BHEL format 03. Filed technical specification 04. Filed BHEL Terms and condition sheet 05. Filed Pre-Qualification requirement (PQR) along with supporting documents 06. Catalogue's 07. MSME Documents (If applicable) 08. Vendor registration documents Documents are to be submitted along with Price bid (Part-2) 01. Priced offer as per BHEL format Note: All the pages of documents are to be signed and stamped by authorized signatory of the company.	
21	Vendor who are not registered with BHEL –Trichy for supply of valves as a permanent vendor, those vendors are requested to submit the vendor registration through online and submit the registration application number along all the necessary documents. (available in http//www.bheltry.co.in/- Online Vendor Registration- Material Management) Note : Vendor have to submit all the documents duly filled in "Supplier Registration Forms" through online (available in http//www.bheltry.co.in/- Online 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) sheet 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.	

BHEL TRICHY

MM/BOI

Annexure – B ---Pre-Qualification requirements (PQR)

Sl.NO	Description	Vendor Confirmation
1	The Bidder shall offer and supply equipment of the type and rating which they have supplied , commissioned in at least one plant of sub / super critical steam generating units with an operating pressure more than 177 kg / Sq.cm in similar applications and are in successful operation for a period of not less than 2 years as on the date of techno commercial bid opening (Part-1)	
2	The bidder can offer and supply such equipment for this project with collaboration or valid licensing agreement for design, engineering, manufacture, supply of such equipment in India provided the collaborator meets the above proven ness criteria.	
3	Bidder shall furnish one performance / End user certificate for the supply of similar valves commissioned in Power Plants with an operating pressure more than 177kg/ sq.cm in English language	
4	In addition to technical and commercial conditions, you have to submit all the documents duly filled in “Supplier Registration Forms” through online (available in http//www.bheltry.co.in/- Online 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) sheet 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.	
5	The offers will be considered for Price Bid opening/Ordering subject to evaluation & approval as per above point 4.0 and also subject to approval by Customer / BHEL.	
6	**Risk Purchase clause:** “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”.	
7	Guarantee clause: 24 months from the date of supply or 18 months from the date of commissioning, whichever is earlier.	
8	BHEL may negotiate the L1 rate, if not meeting our budget/estimated cost.	
9	BHEL may re-float the tender opened, if L1 price is not the acceptable price to BHEL.	

Offers are liable for rejection, if not satisfying above qualifying criteria.

Bharat Heavy Electricals Limited
(High Pressure Boiler Plant)
Tiruchirappalli-620 014, Tamil Nadu, India
Dept : PURCHASE-MATERIALS MANAGEMENT/BOI

An ISO 9001
Company

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 fulfilment 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 on date..... 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

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

Date:

(Signature)

Name -

Membership number -

Seal of Chartered Accountant

(TO BE STAMPED IN ACCORDANCE WITH STAMP ACT AND THE EXPIRY DATE OF BG MUST BE AFTER 60 DAYS FROM THE DATE OF COMPLETION OF WARRANTY PERIOD)

PERFORMANCE BANK GUARANTEE

In accordance of M/s. Bharat Heavy Electricals Limited (A Government of India undertaking, a company incorporated under the Companies Act 1956 having its Registered Office at "BHEL House", SIRI Fort, New Delhi 110 049) through its High Pressure Boiler Plant Division located at Tiruverumbur, Tiruchirapalli- 620 014 (hereinafter called 'the Company') having entered into a contract with …….hereinafter called ' the said contractor ' which term includes 'suppliers' for the purpose of this Bond and under the terms and conditions of the contract No……. Dt ……. Between BHEL, Trichy and as per the contract, the contractor / supplier is to furnish a performance Bank guarantee for Rs. ……. for the due performance of the equipment to be supplied under the above referred contract and for the fulfillment of all the terms and conditions of the contract, We …….(indicate the name of the bank) (herein after referred to as the bank) at the request of …….. (Contractor(s)) do here by undertake to pay the company an amount not exceeding Rs…….against any loss or damage caused to or suffered or would be caused to or suffered by the company by reason of any breach by the said contractor (s) of any of the terms and conditions contained in the said agreement.

2. We …….(indicate the name of the bank with full address), do hereby undertake to pay the amounts due and payable under this guarantee without any demur, merely on a demand from the Company stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by the Company by reason of breach by the said Contractor(s) of any of the terms and conditions contained in the said Agreement or by the reason of the contractor(s) 'failure to perform' the said agreement. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs._____.

3. We undertake to pay unconditionally to the Company any money so demanded notwithstanding any dispute(s) raised by the Contractor in any suit, or proceedings pending before any Court or Tribunal or Arbitration or before any other authority relating thereto our liability under this present being absolute and unequivocal. The payment under this guarantee would not wait till the disputes have been decided by any Court or Tribunal or in the arbitration proceedings or by any other authority. The payment so made by us under this Bond shall be a valid discharge of liability for payment thereunder and the Contractor(s) shall have no claim against us for making such payment.

4. We…….(indicate the name of Bank), further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Agreement and that it shall continue to be enforceable till all the dues of the Company under or by virtue of the said Agreement have been fully paid and its claims satisfied or discharged or till_____Office / Department/ Division of the Company certifies that the terms and conditions of the said Agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharges this guarantee.

5. (I) Unless a demand or claim under this guarantee is made on us in writing on or before the _____we shall be discharged from all the liability under this guarantee thereafter. But where such claim or demand has been preferred by the Company with the Bank before the expiry of the said date, the claim shall be enforceable notwithstanding the fact that the said enforcement is effected after the said date.

(ii) For the purpose of this clause, any letter making demand on the Bank by M/s. BHEL dispatched by Registered Post with Ack.Due or by Telegram or by any Electronic media addressed to the above mentioned address of the Bank shall be deemed to be the claim / demand in writing referred to above irrespective of the fact as to whether and when the said letter reaches the Bank, as also any letter containing the said demand or claim is lodged with the bank personally.

6. We ……..(indicate the name of Bank), further agree with the company that the Company shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance by the said Contractor (s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the Company against the said Contractor(s) and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall not be relieved from our liability by any reason of any such variation or extension being granted to the said Contractor(s) or for any forbearence, act or omission on the part of the company or any indulgence by the company to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating would, but for this provision, have effect of not so relieving us.

7. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s).

8. It shall not be necessary for the company to proceed against the contractor before proceeding against the guarantor-bank and the guarantee herein contained shall be enforceable against them notwithstanding any security, which the company may have obtained or obtain from the Contractor shall, at the time when proceedings are taken against the guarantor hereunder be outstanding or unrealised.

9. Any claim or dispute arising under the terms of this document shall only be enforced or settled in the Courts at Tiruchirapalli.

10. The guarantor hereby declare that it has power to execute this guarantee and the executant has full powers to do so on its behalf under the proper authorities granted to him/them by the guarantor.

11. We ……(indicate the name of Bank) lastly undertake not to revoke this guarantee during its currency except with the previous consent of the company in writing.

In witness whereof we…….., (indicate the name of Bank) have hereunto setout Bank Seal the_____day _____month 200
BANK E-MAIL ID:
BANK PHONE NO.
BANK FAX NO:

List of Consortium Bank			
	Nationalised Bank		**Nationalised Bank**
1	Allahabad bank	19	Vijaya Bank
2	Andhra bank		**Public Sector Banks**
3	Bank of Baroda	20	IDBI
4	Canara Bank		**Foreign bank**
5	Corporation bank	21	CITI Bank N.A
6	Central bank	22	Deutsche Bank AG
7	Indian Bank	23	The Hongkong and Shanghai Banking Corporation Limited
8	Indian Oversea Bank	24	Standard Chartered Bank
9	Oriental bank of Commerce	25	The Royal Bank of Scotland N.V.
10	Punjab National Bank	26	J P Morgan
11	Punjab & Sindh Bank		**Private bank**
12	State Bank of India	27	Axis Bank
13	State Bank of Hyderabad	28	The Federal Bank Limited
14	Syndicate Bank	29	HDFC
15	State Bank of Travancore	30	Kotak Mahindra Bank
16	UCO Bank	31	ICICI
17	Union Bank of India	32	Indusind Bank
18	United Bank of India	33	Yes Bank

PACKAGE --- SUPPLY OF RECIRCULATION CONTROL VALVES TO NEYVELI PROJECT (2 X 500 MW)									
PRICE / UNPRICE FROMAT FOR IMPORT VENDORS									
Enquiry Sl. No	**Items Details / Description**	Qty	Net Weight	Gross weight	size	Unit Rate	Total Material Cost	Sea Freight Charge	Total Value (CFR-Chennai)
			Kgs	Kgs	L x B x H	Currency -Type	Currency -Type	Currency -Type	Currency -Type
10									
20									
30									
40									
50									
60									
70									
80									
90									
100									
110									
120									
130									
140									
150									
160									
170									
**	**TYPE TEST CHARGE FOR CONTROL VALVE**	1	-	-	-			NOT APPLICABLE	
Note : Vendor shall quote See freight amount. Don't indicate freight are inclusive/ Zero Value.									
								TOTLA PRICE - FOB / Nearest Sea Port	
								TOTAL SEA FREIGHT CHAGES	
								TOTAL PRICE - CFR / CHENNAI PORT	

PACKAGE --- SUPPLY OF RECIRCULATION CONTROL VALVES TO NEYVELI PROJECT (2 X 500 MW)								
PRICE / UNPRICE BID FOR INDIGENOUS VENDOR								
Enquiry Sl. No	**Items Details**	Qty	Unit Rate	Total Material Cost	Excise Duty	Sales Tax	Freight & Insurance Charge	Total Value (FOR)
			Rs	Rs	%	%	Rs	Rs
10					Exempted			
20					Exempted			
30					Exempted			
40					12.50%			
50					12.50%			
60					12.50%			
70					12.50%			
80					12.50%			
90					12.50%			
100					12.50%			
110					12.50%			
120					12.50%			
130					12.50%			
140					12.50%			
150					12.50%			
160					12.50%			
170					12.50%			
**	**TYPE TEST CHARGE FOR CONTROL VALVE**		-	-	NA			
Note : Vendor shall quote freight and insurance amount. Don't indicate freight & Insurance are inclusive/ Zero Value.								

FORM NO. PEM-6666-0

	DATA SHEET FOR CONTROL VALVES (WITH PNEUMATIC ACTUATOR)	**SPECIFICATION NO.: RCV** **SECTION :Boiler Mountings/PE(FB)** **REV. NO. 00** | **DATE : 29.10.15** **SHEET 1 OF 2**

Tag No. : 01HAG30 AA451 **Qnty. : 1No/ BOILER** **TOTAL : 2Nos / PROJECT**

DATA SHEET – A FOR CONTROL VALVE WITH PNEUMATIC ACTUATOR (TO BE FILLED UP BY PURCHASER)			DATA SHEET – B (TO BE FILLED UP BY BIDDER)
GENERAL	PROJECT	**NLC / NEYVELI TPP 2X500 MW**	
	SERVICE	Recirculation Control Valve	
	LOCATION	Outdoor	
	DUTY	Regulating	
	PIPE SIZE (inlet / outlet)	355.6 x 40 / 355.6 x 40	
	PIPE MATERIAL (inlet / outlet)	SA106Gr C / SA106Gr C	
	MEDIUM	Water	
BODY	MODEL No.		
	TYPE OF BODY: GUIDING: No. OF PORTS	ANGLE	
	BODY SIZE : PORT SIZE : DESIGN CV	350 NB	
	END CONNECTION & RATING (ANSI)	**BUTT WELD; INLET : Style P ,d1= 285.6 mm** **OUTLET: Style P ,d1= 285.6mm**	
	BODY MATERIAL	**WCC**	
	PACKING MATERIAL	GRAFOIL	
	BONNET TYPE	STD / EXTENDED / FINNED	
	TRIM FORM	EQUAL PERCENTAGE	
	TRIM MATERIAL: SEAT / PLUG // CAGE / STEM		
	BALANCED / UNBALANCED		
	FLOW	BELOW SEAT / ABOVE SEAT	
	VALVE OUTLET VELOCITY		
	REQUIRED LEAKAGE CLASS	**V**	
	NOISE LEVEL in dBA	LESS THAN 85 dBA	
	FLOW DIRECTION	UPWARD-HORIZONTAL	
	ANTI CAVITATION TRIM		
	VALVE LIFT in mm		
PNEUMATIC ACTUATOR	MODEL No. & SIZE		
	CLOSE AT : OPEN AT (Kg/cm²(g))	AIR TO OPEN	
	TRAVEL TIME FOR		
	OPEN TO CLOSE, CLOSE TO OPEN	<10 Secs / <10 Secs	
	VALVE POSN. ON SIGNAL AIR FAILURE	STAY PUT	
	VALVE POSN. ON SUPPLY AIR FAILURE	STAY PUT	
PERFORMANCE OF VALVE	LINEARITY	± 2%	
	HYSTERISIS	± 1%	
	SENSITIVITY	± 0.5%	
	ACCURACY (OVERALL)	± 2%	

SERVICE CONDITIONS

Sl. No.	LOAD	FLOW Kg/s	INLET PR. Bar(a)	OUTLET PR. Bar(a)	PR. DROP kg/cm²(g)	INLET TEMP (°C)	Sp. Gravity	Calc. Cv	Valve Lift %	Valve outlet velocity	Noise Level dBA
1.	Restart	167.1	170.3	166.3	4	347.3					
2.	Cold start	167.1	21.9	8.6	13.3	60					
3.	Min Recirculation Flow	11	108	99	9	302					

ACTUATOR SIZING PRESSURE/ MAX PRESSURE DIFFERENCE : 218 bar (g) / 30 bar
BODY DESIGN: PRESSURE / TEMPERATURE : 218 bar (g) /380 deg C
IBR FORM – III C : REQUIRED
TOTAL WEIGHT (VALVE+ACTUATOR+ACCESSORIES) : Kgs.
Valves should be directly weldable to connecting pipe without the use of Reducers.

DATA SHEET – A FOR CONTROL VALVE WITH PNEUMATIC ACTUATOR (TO BE FILLED UP BY PURCHASER)			DATA SHEET – B (TO BE FILLED UP BY BIDDER)
ACCESSORIES	SMART POSITIONER AIR FILTER REGULATOR AIR LOCK RELAY POSITION LIMIT SWITCH POSITION TRANSMITTER SOLENOID VALVE I/P CONVERTER JUNCTION BOX HAND WHEEL (SIDE MOUNTED) LOCAL POSITION INDICATOR VOLUME BOOSTER & DUMP VALVE	REQUIRED REQUIRED REQUIRED REQUIRED INBUILT IN SMART POSITIONER NOT REQUIRED INBUILT IN SMART POSITIONER REQUIRED REQUIRED REQUIRED REQUIRED / NOT REQUIRED	
SMART POSITIONER	MANUFACTURER & MODEL No. BYPASS : GAUGES : ENCLOSURE CLASS INPUT SIGNAL OUTPUT SIGNAL	 YES / NO / TWO : IP-65 4 to 20 mA TO SUIT ACTUATOR	REFER SPECIFICATION OF SMART POSITIONER
AIR FILTER REGULATOR	MANUFACTURER & MODEL No. TYPE AIR SUPPLY PRESSURE in kg/cm²(g) MAXIMUM AIR SUPPLY PRESSURE in Kg/cm²(g) OUTPUT PRESSURE in kg/cm²(g) FILTER ELEMENT FILTER ELEMENT MATERIAL BOWL MATERIAL ENCLOSURE PROTECTION CLASS/ MATERIAL PROCESS CONNECTION ACCESSORIES	 CONSTANT BLEED TYPE 3.0 to 5.0 Kg/cm²(g) 10 Kg/cm²(g) TO SUIT ACTUATOR 5 MICRONS PHOSPER BRONZE METALLIC IP-65/ DIE CAST ALUMINIUM 1/4 " NPT ALL MOUNTING ACCESSORIES 2" DIAL SIZE PRESSURE GAUGE	
AIR LOCK	MANUFACTURER & MODEL No. SET PRESSURE in kg/cm²(g) SUPPLY PRESSURE in kg/cm²(g) RESET TYPE VENT PLUG	 3.0 to 5.0 AUTO	
LIMIT SWITCH	MANUFACTURER & MODEL No. TYPE OPEN : & : CLOSE POWER SUPPLY SENSING DISTANCE HYSTERSIS INDICATOR INTEGRAL CABLE PROTECTION CLASS MOUNTING OTHER FEATURE	 NON-CONTACT TYPE INDUCTIVE PROXIMITY 1 No. : FOR OPEN: 1 No. FOR CLOSE 24 V DC/ 8 V DC 10 MM MINIMUM MAXIMUM 10% OF SENSING DISTANCE. LED 1 MTR IP67 FLUSH MOUNTING WITH CHECK NUT EXPLOSION ,SHOCK AND VIBRATION PROOF	
POSITION TRANSMITTER	MANURACTURER & MODEL No. TYPE SUPPLY OUTPUT RATING ACCURACY ENCLOSURE CLASS	 **INBUILT IN SMART POSITIONER**	
SOLENOID VALVE	MANURACTURER & MODEL No. RATING OPERATION / 4 WAY, DUAL COIL COIL INSULATION CLASS ENCLOSURE CLASS	 24V, DC STAYPUT / 4 WAY, DUALCOIL CLASS-H IP65 / NEMA4	NOT APPLICABLE
HANDWHEEL	ORIENTATION	SIDE MOUNTED	
JUNCTION BOX	No. OF WAYS 4 Nos. of 9 PIN PLUG & SOCKETS (OUT OF 4 Nos. of 9 PIN PLUG & SOCKET 1 No. is SPARE) CABLE GLANDS: (SIZE / QNTY) ENCLOSURE CLASS	CAGECLAMP/THIRTYSIX/ 2.5 SQ.MM REQUIRED: 16MM /3 NO/ BRASS WITH NICKEL PLATED / BOTTOM IP55	
I/P CONVERTER (Fail Freeze Type)	INPUT SIGNAL : POWER SUPPLY SPLIT RANGE ENCLOSURE CLASS	**INBUILT IN SMART POSITIONER**	

	PREPARED BY	CHECKED BY	APPROVED BY	VENDOR SEAL
SIGN. :				SIGN:
NAME :	A.JAI GANESH	NOORUL FAZIL	K.SRIDHARAN.	NAME:
DATE :	29.10.15	29.10.15	29.10.15	DATE:

BHARAT HEAVY ELECTRICALS LIMITED
TIRUCHIRAPALLI – 620 014

SPECIFICATION FOR SH / RH BLOCK / CONTROL AND SBPRV

Rev. No.	Date	Reason	PREPARED		CHECKED		APPROVED	
01.	22.03.03	Specn. has been revised	D.A.D.		K.P.S.		G.U.	

I. VALVE SIZING:

1. The SH and RH Spray Control Valve sizing shall be suitable for obtaining maximum operating conditions with valve opening at approximately 90% of total stem travel. Valves shall be open not less than 15% of full opening for minimum flow condition. At full open condition the valve capacity should not exceed 130% of the required maximum flow indicated in Data Sheets.

   For SBPRV, the lift % is to be within the range of 30% to 85% for the indicated conditions in Data Sheet.

2. The SH / RH spray control valves should have equal percentage flow characteristics. The SBPRV is to have modified parabolic characteristic. The SH / RH Block Valves are to be of quick opening characteristic.

3. The valve sizing shall be in compliance with latest edition of ISA S75.01 Hand book on Control Valves considering measures to avoid choked flow.

4. The turndown of the valve offered should not be less than 30:1 for SH / RH Spray Control Valve applications.

5. The control valve size should not be smaller than connecting line size by more than 1 step.

II. TRIM SELECTION:

1. The trims of all regulating control valves should be cage guided type. Top guided design is not acceptable.

2. The valve model proposed should be designed to prevent cavitation, wire drawing and flashing on the downstream side of the valve and piping for operation throughout the full range under the specified conditions. For cavitation service, the trim design shall be of multistage pressure drop type to prevent cavitation occurring downstream of trim / valve.

3. The bidder shall furnish detailed calculation based on the operating conditions for each control valve to establish whether cavitation / flashing will occur or not for the particular service.

4. The bidder shall ensure that the valve outlet velocity not exceed 8 metres / second for liquid service and 0.3 Mach for steam service by selecting proper body & trim size.

5. The trims shall be of quick change type.

III NOISE LEVEL:

1. The bidder has to submit calculated noise levels (dBA) for the operating conditions specified with valve untagged.

2. Sound pressure level at all conditions shall not be greater than 85 dBA when measured at 1.0 meter downstream of the valve and 1.0 meter away from the pipe. The noise abatement shall be obtained by valve body, trim design and piping arrangement and not by the use of silencers.

IV. VALVE CONSTRUCTION:

1. Control valves, their actuators and associated ancillary equipment must be selected to suit the application, design and working conditions specified and also the environmental conditions in which they are installed. The pressure and temperature rating of valve body shall be equal or exceed the process design conditions on control valve data sheet.

2. Valves and their actuators shall be adequately rated to suit the maximum differential pressure against which they will have to work, i.e. when the valve is fully closed.

3. Valve guiding and seating systems shall be so designed that smooth control is maintained over the full operational stroke. Design should be such that it eliminates vibration.

4. Valves shall have the direction of flow clearly indicated on the body by a permanent mark.

5. Gland packing must be of graphite.

6. The boiler water system will be acid cleaned at site using a 1 to 1.5% (by weight) inhibited hydrofluoric acid. The valve internals must be capable of withstanding hydrofluoric acid without getting damaged.

7. The Leakage Class of Block Valves is to be Class-V and for regulating control valves Class-IV as per FCI 70.2.

V. DETAILS TO BE INDICATED IN NAME PLATE:

The following are to be indicated in English Language.

1. Tag. No. and Valve Serial No.
2. Valve size, Body material and ANSI rating.
3. Trim material, Trim size / Cv and characteristic.
4. Action on air failure.
5. Spring range.
6. Stem travel in mm.
7. Make and Model Nos. of Accessories.

VI. ACCESSORIES: As per BHEL Data Sheet

VII. DOCUMENTS REQUIRED:

a) Along with offer:

1. Single A2/A3 size Cross Sectional drawing of the valve model offered showing clear details of valve body, bonnet, gland packing, plug, cage, seals, seat ring, stem with the materials of construction.
2. Filled up BHEL Data Sheet.
3. Lift % vs Cv % curves.
4. Junction Box wiring diagram.
5. Valve sizing calculations.
6. Pneumatic hook up diagram.

7. Calculations to demonstrate the suitability of the selected valve to combat.

   - Cavitation for liquid service.
   - Noise level.

   Without the above details the offers will be treated as incomplete and liable for rejection.

b) <u>After placement of P.O.</u>

1. Dimensional drawing.
2. Data Sheets.
3. Edge preparation drawing.
4. Pneumatic hook up diagram and Junction Box wiring diagram.

VIII. O&M MANUALS:

Three copies in CD-ROM and six hard copies of valve and its accessories are to be submitted after placement of P.O.

1. IBR Form – IIIC to be submitted.
2. Hydrostatic test in accordance with ANSI b 16.34 prior to seal leakage test.
3. Leakage test as per FCI 70.2 as per leakage class indicated in Data Sheets.
4. Opening time / Closing time for assembled valve.
5. Cv test where called for in Data Sheet shall be carried out as type test on each size, type and design of the valves as per ISA 75.02. Test Report shall be submitted for Approval. Where Cv test has been already performed on an earlier date, the Test Report for the same can be submitted for Approval. (The Cv Test should be performed in Government certified labs like FCRI only).
6. Linearity and Hysterisis of the assembled valve.

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9.24 Carbon Monoxide Analyzer

Table 9.23

Specification for Carbon Monoxide Analyzer

1	Type	In-situ type
2	Principle	IR Double beam absorption
3	Sensor Type	IR
4	Measurement Range	0-999 ppm selectable
5	Accuracy	+/- 0.2 % of full scale
6	Linearity	+/- 1% of full scale
7	Response time	3 seconds or less (Up to 90% of full scale)
8	Drift	+/- 0.005% per 2 Deg. Centigrade temp. change
9	Operating Temperature Range	0-1600 °C
10	Temperature Compensation	Automatic
11	Sample filter	Ceramic 3.5 micron
12	Zero & Span Adjustment	Required
13	Ambient Temperature	60°C
14	Indication	Digital
15	Enclosure Type/Material	Weather & Dust proof IP-65/ SS 316
16	Type of Electronics	Microprocessor based with self diagnostic facility
17	Calibration	Auto & manual
18	Output signals	Analog: 4-20 mA DC Binary: 2 NO + 2 NC for Alarms
19	Digital Signal transmission	RS-232 or RS-485 OR as per requirement to suit connection protocol of Plant DCS
20	Other requirement	HART Communication protocol compatibility & suitable for connection to Smart Transmitter Maintenance system. Purging System.

9.25 Control Valves

A. Introduction

The control valves and accessories equipment furnished by the Supplier shall be designed, constructed and tested in accordance with the latest applicable requirements of code for pressure piping ANSI B 31.1, the ASME Boiler & Pressure Vessel code, Indian Boiler Regulation (IBR) & ISA or acceptable equal standards.

B. Control Valve Design & Sizing

1. The design of all valve bodies shall meet the specification requirements and shall conform to the requirements of ANSI for dimensions, material thickness and material specification for their respective pressure classes.

2. The valve sizing shall be suitable for obtaining maximum flow conditions with valve opening at approximately 80% of total valve stem travel and minimum flow conditions with valve stem travel not less than 10% of total valve travel. All the valves shall be capable of handling at least 120% of the required maximum flow. Further, the valve stem travel range from minimum flow condition to maximum flow condition shall not be less than 50% of the total valve stem travel. The sizing shall be in accordance with the latest edition of ISA Handbook on control valves. While deciding the size of valves, Supplier shall ensure that valves outlet velocity does not exceed 8 m / sec. for liquid services, 150 m/sec. for steam services and 50% of sonic velocity for flashing services. Supplier shall furnish the sizing calculations clearly indicating the outlet velocity achieved with the valve size selected by him as well as noise calculations, which will be subject to Consultant's / Owner's approval during detailed engineering.

3. Control valves for steam and water applications shall be designed to prevent cavitations, wire drawing, flashing on the downstream side of valve and down stream piping. Thus for cavitations / flashing service, only valve with anti-cavitations trim shall be provided. Detailed calculations to establish whether cavitations will occur or not for any given application shall be furnished.

Amend - 8.1
Sl. No - 243

4. Trim shall be multistage type having sufficient number of discrete pressure drop turns (stages) to ensure elimination of vibration, erosive – action, cavitations. Bidder shall identity the number of pressure drop turns in proposed equipment and shall also provide calculation demonstrating compliance to the trim exit velocity.

5. To prevent flow induced vibration and to protect the valve internals from foreign particles such as weld slag flow, direction shall be a flow to close (over the plug) configuration for liquid applications. To maximize noise attenuating benefits and to allow for constant fluid expansion, flow direction will be under the plug for steam and gas applications.

6. Control valves for application such as SH spray control, RH spray control, Heavy oil pressuring & control system shall have permissible leakage rate as per leakage class V. All other control valves such as low and high range feed control valves etc shall have leakage rate as per leakage class IV.

7. The control valve induced noise shall be limited to 85 dBA at 1 meter from the valve surface under actual operating conditions. The noise abatement shall be achieved by valve body and trim design and not by use of silencers.

Sr. No	Volume / Section	Cl. No/	Page No	Description	Deviation / Reason	NLC/LII Reply	BHEL Reply	Final Resolutions during th meeting
					as VDE (VDE standard calls for 225V grade cable). Instrumentation cables shall be provided as per relevant IS with voltage grade 1.1kV and not VDE (225V).Please confirm.	Bidder to confirm compliance.		
	PEM (C & I)							
243.	SG, Vol-III / C&I-NTA1	9.25 B(4)	117	Trim shall be multistage type having sufficient number of discrate pressure drop turns (stages) to ensure elimination of vibration, erosive – action, cavitation.	The process parameters (pressure/temperature) of DMCW valve are not high. It does not qualify for severe service with anti-cavitation trim. Hence, multistage trim type is not required/ envisaged. Please confirm.	Bidder shall confirm compliance to Tender specification in general. However, any specific changes required for particular services shall be finalized during detail engineering.	PEM: Noted	This is clarification and no deviation.

8. The characteristic of the control valves shall be determined based on the application / service.
9. On supply air or electrical failure for pneumatic / electrical drive, the valve shall remain full closed, open or stay – put position as per process safety requirement.

C. Valve Construction

1. Proper selection of valve type and material of construction to meet operating requirement.
2. All valves shall be of globe body design and straightaway pattern with single or double port unless otherwise recommended by the manufacturer to be of angle body type. Rotary valve may alternatively be offered when pressure or pressure drops permit.
3. Valves with high lift cage guided plugs & quick charge trims shall be supplied.
4. Cast iron valves are not acceptable.
5. Bonnet joints for all control valves shall be of the flanged and bolted type for easy dis – assembly. Bonnet joints of internal threaded or union type will not be acceptable.
6. Plug shall be of one – piece construction either cast, forged or machined from solid bar stock. Plug shall be screwed and pinned to valve stems or shall be integral with the valve stems.
7. All valves connected to vacuum on down stream side shall be provided with packing suitable for vacuum applications (e.g. double vee type chevron packing).
8. Valve characteristic shall match with the process characteristics.
9. Extension bonnets shall be provided when the maximum temperature of flowing fluid is greater than 280 °C.
10. Flanged valves shall be rated at not less then ANSI pressure class of 300 lbs.
11. Teflon shall be used for valve gland packing to suit process requirement.
12. The valve body shall be marked to show direction of flow.

D. Valve Materials

1. The control valve body material shall be
   - Carbon steel as per ASTM – A216 GR WCB for non – corrosive, non – flashing and non – cavitations services below 275 deg c temperature like Auxiliary Steam flow to Deaerator, CRH flow to Deaerator, Condensate flow to Deaerator etc.
   - Alloy steel as per ASTM – A217 GR WC 9 for severe flashing / cavitations services like low load and full load feed water control, HP and LP heaters emergency drains, Deaerator overflow drain to Hotwell etc.
   - Alloy steel as per ASTM A – 217 GR WC 6 for low flashing / cavitations services like HP heaters & LP heaters normal drain control, drain cooler normal level control, gland steam cooler minimum flow etc.
   - 316 SS for condensate service below 300 deg C like condensate normal and emergency make – up controls etc.
2. The control valve trim material shall be
   - 17 – 4 PH SS for severe services listed under item D.1, 2nd point & 3rd point above
   - 316 SS for services listed at D.1, 4th point above and
   - 316 SS with stellite faced guide parts and bushings for remaining applications.
3. However, Supplier may offer valves with body and trim materials better than specified materials and in such cases Supplier shall furnish the comparison of properties including cavitations resistance, hardness, tensile strength, strain energy, corrosion resistance and erosion resistance etc. of the offered material vis – a – vis the specified material for Owner's / Consultant's consideration and approval.

E. End Preparation

Valve body ends shall be either butt welded / socket welded, flanged or screwed as finalized during detailed engineering and as per Owner's / Consultant's approval. The welded ends wherever required shall be butt welded type as per ANSI B 16.25 for control valves of sizes 65 mm and above. For valves sizes 50 mm and below welded ends shall be socket welded as per ANSI B 16.11. Flanged ends wherever required shall be of ANSI pressure – temperature class equal to or greater than that of the control valve body.

Sr. No	Volume / Section	Cl. No/	Page No	Description	Deviation / Reason	NLC/LII Reply	BHEL Reply	Final Resolutions during the meeting
				of flame detector head unit at field.				
102.	SG, Vol III	7.2.8(2)	71	The controls & protection required for the mill fire detection system and air heater fire detection system shall be implemented in the Plant DCS, using rate-of-rise algorithm taking care of manufacturer's recommendation.	Mill temperature will be monitored with temperature elements at Mill outlet & in case of higher temperature, the mills will be tripped. Airheater fire sensing thermocouples are provided in the air heaters which will provide alarm at high temperature.	Bidder shall provide all sensors/ detectors required for Mill fire detection system and Airheater fire detection system. Bidder to confirm. (The controls & protection for the same shall be implemented in plant DCS)	Mill temperature will be monitored with thermocouples at Mill outlet & in case of higher temperature, an alarm will be given and upon further rise of temperature the mills will be tripped. Airheater fire sensing thermocouples are provided in the air heaters which will provide alarm at high temperature.	M/s BHEL/Alstom clarified that, 10 nos. of thermocouples are provided for each mill (4 nos. at mill inlet, 2nos. at mill door and 4 nos at mill outlet) and from the 4 mill outlet thermocouples, mill fire will be detected and mill outlet temperature will be Controlled and hence this is not deviation. NLC/LII noted.
103. se	SG, Vol III	7.3.5	75	Lignite Mill: Remote monitoring and alarm facility for the following parameters shall be provided.. • Mill DP	Since beater wheel mills are provided for lignite, Mill differential pressure (DP) measurement is not provided.	The measurements mentioned in the TS are indicative only and the same will be finalized during detailed engineering. Hence, BHEL is requested to withdraw the deviation.	For the lignite mills, DP measurement is not applicable. Hence clarification stands	NLC/LII accepted the deviation and agreed to delete DP measurement across beater wheel type mill. The Specification is changed as ' Mill DP (not applicable for Beater wheel type)'.
104.	SG, Vol III	9.2.5 (F)	120	The regulating control valves shall be furnished with pneumatic actuators.	The type of regulating actuator shown for dampers in the P&IDs are indicative. The final type of actuator shall be	The type of actuator for regulating dampers shall be decided during detail engineering. For all regulating control	Clarification stands	M/s BHEL/Alstom withdrew the deviation and confirmed compliance to Tender specification.

Sr. No	Volume / Section	Cl. No/	Page No	Description	Deviation / Reason	NLC/LII Reply	BHEL Reply	Final Resolutions during the meeting
					decided during detail engineering.	valves, pneumatic actuators shall be provided. Bidder shall confirm.		
105.	SG/VOL III C&I	9.6	96	Metal temperature thermocouple: 6. For detection of leakage of various drain valves, drain pipe metal temperature thermocouples and for SH, RH metal temperature thermocouples shall be provided.	Drain pipe metal temperature thermocouples are not envisaged for the drain valves	Deviation is accepted. Hence the TS clause is modified as follows: "For SH, RH metal temperature measurement, metal temperature thermocouples shall be provided as per the specification in Table 9.5."	Noted	NLC/LII noted. Refer Annexure 3.7 29
106.	SG/VOL III C&I	3.1 (8)	13	Supply, Installation & Commissioning of Acoustic Pyrometers to measure average flue gas temperature & flue gas temperature profile at furnace exit plane & at economiser outlet. The system shall be complete with all required accessories.	Acoustic pyrometers are not proven for Indian operating conditions and hence not offered.	Acoustic Pyrometers shall be supplied as per Tender specification requirements. Bidder to withdraw the deviation and confirm compliance to Tender specification.	Deviation stands.	M/s.BHEL informed that, Acoustic Pyrometers is not proven for Coal fired boilers based on their experience. NLC/LII informed that Acoustic pyrometers are working in Indian boilers and hence shall be provided as per tender specification. M/s BHEL/~~Alstom~~ informed that, deviation stands, since Acoustic Pyrometer is not proven for Lignite Fired Boilers. NLC/LII insisted that, Acoustic Pyrometer shall be provided as per Tender epecification and noted this deviation.
107.	SG/VOL III C&I	7.2.6	69	Acoustic Pyrometer				Refer resolution in sl. No. 106
108.	SG/VOL III C&I	4.7	20	Temperature Elements: K Type Thermocouples shall be used for all	Since the furnace exit gas temperature is less than 1200 deg C, K	Bidder is requested to refer Cl. 9.4, S. No. 1, page 93, Vol. III of	Noted	M/s BHEL informed that, this is only clarification and not deviation. NLC/LII noted.

Annexure-II Sl.No-10A

F. Valve Actuator

1. The regulating control valves shall be furnished with pneumatic actuators. The supplier shall be responsible for proper selection and sizing of valve actuators in accordance with the pressure drop and maximum shut off pressure and leakage class requirements. The valve actuators shall be capable of operating at 60 *C continuously.
2. Valve actuators and stems shall be adequate to handle the unbalanced forces occurring under the specified flow conditions or the maximum differential pressure specified. An adequate allowance for stem force, at least 0.15 kg / cm^2 per linear millimeter of seating surface, shall be provided in the selection of the actuator to ensure tight seating unless otherwise specified.
3. The travel time of the pneumatic actuators shall not exceed 10 seconds.
4. For quick opening / closing services (such as fuel oil shut – off valve), the actuator shall be pilot solenoid operated pneumatic drive; the rating of solenoid shall be 24 V DC.
5. Selection of actuator shall be such that it meets the requirements of thrust / torque, stroke length, angular movement, full scale travel time, repeatability & accurate positioning for successful operation of final control element.
6. All the actuators shall have also provision for manual operation during emergency / maintenance along with graduated local position indicator.

G. Control Valve Accessory Devices

All control valve accessories such as air locks, hand wheels / hand-jacks, limit switches, SMART positioners, diffusers, external volume chambers, reversible pilot for positioners, tubing and air sets, solenoid valves and junction boxes etc. shall be provided as per the requirements.

Table 9.24(i)

Specification for E-to-P converter

S.N	Feature	Value
1	Air Supply	1.5 Kg/Sq. cm
2	Input Signal	4-20 mA DC
3	Output Signal	0.2 to 1.0 Kg/ Sq. cm
4	Linearity	0.5 % of span or better
5	Hysteresis	0.1 % of span or better
6	Ambient Temperature	<0.2 % of span per Degree centigrade

	Effect (-20 to +60 °C)	
7	Mounting	Close to Actuator
8	Protection class	IP-65
9	Enclosure	Die cast Aluminium
10	Drift	+/- 2% of set point per hour

Table 9.24(ii)

Specification for Smart Positioners

1	Input	4-20 mA DC	
2	Power Supply	24 V DC Loop powered	
3	Type of Electronics	Microprocessor based with self diagnostic facility & digital communication by means of HART Protocol	
4	Valve position sensing	Non-Contact type with 4-20 mA DC Output	
5	Enclosure Type/Material	Weather & Dust proof to IP-65/ Die cast Aluminium	
6	Ambient conditions	Suitable for - 30 to +80 °C temperature & 0-95% Humidity	
7	Operating Range	Suitable for Full range & Split Range operation	
8	Modes of operation	Suitable for Direct & reverse valve action	
9	Flow characteristics	Suitable for Linear & Equal percentage Characteristics	
10	Fail safe/Freeze feature	Required	
11	Air Capacity	Sufficient to handle the Valves Selected/Boosters to be supplied if required.	
12	Air supply pressure	To suite the Air Supply Pressure / Quality available	
13	Process Connection	1/4" NPT	
14	Characteristic Deviation	< =0.5% of span	
15	Ambient Temperature effect	<=0.01%/Deg C or better	
16	Configuration	Remote Calibration, Auto & Manual Calibration shall be possible	
17	Cable Entry	½" NPT, Side or Bottom Entry to avoid water ingress	
18	Accessories	a)	Display with push buttons for configuration and Display on the positioner itself (Password Protected / Hardware Lock).
		b)	For Supply & Output Pressure, Filter Regulator and other accessories shall be provided as on required basis for making system complete
		c)	Valves Mounting Assembly For Sliding Stem / Rotary / Single Acting / Double Acting on required basis

1. SMART positioner shall be a Double stage positioner. The first stage of the positioner shall be typically a flapper-nozzle that serves as a high-gain pre-amplifier. This sensitivity shall be maintained over a wide range of dynamic conditions. Second stage shall be a power amplifier that provides power to drive the actuator. Preferably this shall be a pneumatic relay. Spool Driven type SMART positioners are not preferred due to Higher Dead Band and Poor responsiveness. The SMART positioner shall have pressure sensors to measure the pneumatic outputs to the actuator.

2. The control algorithm for the positioner shall use feedback signal from the motion of the pneumatic relay beam instead of pressure feedback to minimize pneumatic related effects and for stable and smooth response of the control valve. The SMART positioner shall have user adjustable tuning sets to identify the optimum tuning for the total valve assembly. SMART Positioner with HART Communication facility shall communicate all the valve diagnostics to Plant DCS.

Table 9.24(iii)

Specification for Air Filter Regulator (AFR)

1	Type	Constant Bleed type
2	Inlet Pressure	10 Kg/Sq. cm (maximum)
3	Output	Adjustable from 0-2 Kg/Sq. cm or 0-7 Kg/Sq. cm (Continuous) as required
4	Filter Element	5 microns
5	Filter Element Material	Phosphor Bronze
6	Bowl Material	Metallic
7	Enclosure Protection class/ Material	IP-65/ Die cast Aluminium
8	Process connection	¼ " NPT
9	Accessories	All mounting accessories. 2" dial size Pressure gauge.

Table 9.24(iv)

Specification for Position Transmitter

1	Power Supply	24 V DC Loop powered
2	Type	Non-Contact/ LVDT type
3	Output	4-20 mA DC/ Linear
4	Accuracy	+/- 1%
5	Enclosure Protection class/ Material	IP-65/ Die cast Aluminium
6	Cable Entry	½" NPT, Side or Bottom Entry to avoid water ingress.

7	Accessories	All mounting accessories

Table 9.24(v)

Specification for Limit Switch (Non Contact Type)

1	Type	Non-contact type inductive Proximity
2	Sensing distance	10 mm minimum
3	Hysteresis	Maximum 10% of sensing distance
4	Indicator	LED indication
5	Protection class	IP 67
6	Integral Cable	1 mtr.
7	Power supply	24 V DC/ 8 V DC
8	Mounting	Flush mounting with check nut
9	Other Feature	Explosion proof enclosures shall be provided wherever required by the application. Shock & Vibration proof.

G. Test & Examination

1. All valves shall be tested in accordance with the quality assurance programme agreed between the Owner / consultant and the bidder which shall meet the requirement of IBR and other applicable codes.
2. The tests shall include but not but limited to the following:
   - Non-destructive test as per ANSI B – 16.34.
   - Hydrostatic shell test in accordance with ANSI B16.34 prior to seal leakage test.
   - Valve closure test and seal leakage test in accordance with ANSI B16.34 and as per the leakage class indicated under clause no. B.6.
   - Functional test: The fully assembled valves including actuators control devices and accessories shall be functionally tested to demonstrate times from open to close position.
   - All control valves shall be tested with the positioners for accuracy of positioning and reproducibility over the full range of travel.
   - CV Test : CV test shall be carried out as type test on each size, type and design of the valves as per AISA 75.02 standard and test report shall be furnished for Owner's / consultant's approval.

- Magnetic particle inspection shall be performed on all machined surfaces of valves having ASA rating of 1500 lbs ASA or greater. All carbon steel valves with 1500 lbs ASA or greater shall receive 100% radio graphic examination in accordance with ASTM – E71.

3. Bidder shall submit test certificates for the tests mentioned in above paragraphs in accordance with ASME and ASTM requirements. In addition supplier shall also submit for the above equipment, certificate of manufacture and test as required by the Indian Boiler Regulations. The certificate shall be in the prescribed forms III A & III C and shall be endorsed by an Inspection Authority recognized by the Indian Boiler Regulations.

H. General Requirements

1. Bidder shall furnish all the control valves as finalized during detailed engineering stage without any price repercussions whatsoever depending on the process requirements.
2. Following documents to be furnished by the Supplier after the award of contract.
   a. Final data sheet for all control valves.
   b. Detailed dimensional and cross-sectional drawing of control valves, indicating end to end dimensions, various clearances required, weight etc.
   c. Test certificate for the following :
      - Hydrostatic test for all control valves
      - Magnetic particle inspection for all control valves.
      - Radiographic examination of control valves.
      - Seal tightness test for control valves
      - Materials test certificate for control valves.

9.26 Pneumatic Power Cylinder

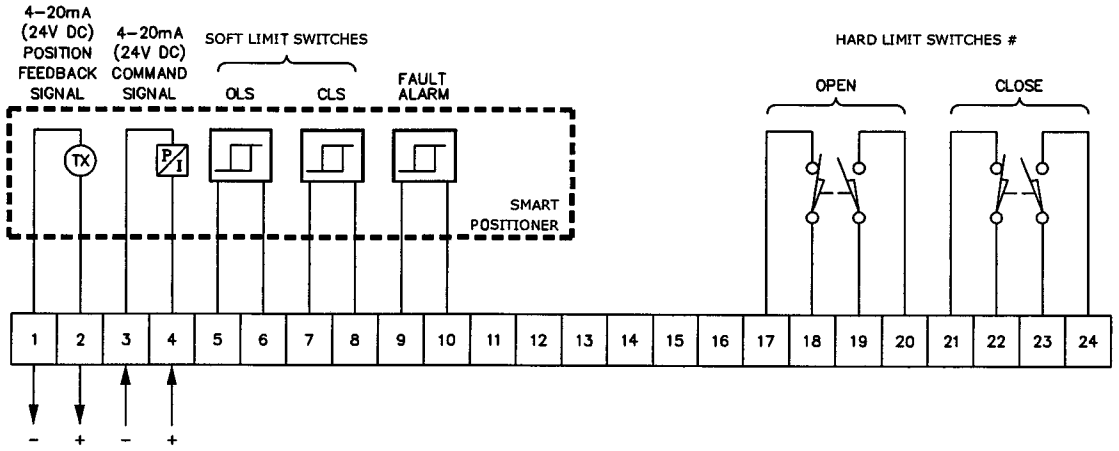
Table 9.25

Specification for Pneumatic Power Cylinder

1	Applicable standard		ISO 6431
2	Mounting Type		Fixed Position mounting/ Trunion mounting
3	Material	Cylinder	Seamless Steel Tube
		Piston rod	Hard Chrome Plated Steel

DRAWING NO: 3-97-599-22899

TB DIAGRAM OF REGULATING DUTY PNEUMATIC ACTUATOR



NOTE

1. LIMIT SWITCH POSITIONS ARE SHOWN FOR INTERMEDIATE POSITION OF ACTUATOR.
2. # – APPLICABILITY OF HARDWIRED LIMIT SWITCHES SHALL BE AS PER APPLICATION REQUIREMENT, INDICATED IN VALVE/DAMPER DATASHEET.

REV	DATE	ALTERED :
		CHD./APPD. :
ZONE		

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT: STANDARD

Bharat Heavy Electricals Ltd
UNIT: HIGH PRESSURE BOILER PLANT
TIRUCHIRAPPALLI – 620014

	NAME	SIGNATURE	DATE	NO. OF VAR
DRN	A.ThambuRaj	030715	03-07-15	—
CHD	M.Muruga Prabu		04-07-15	
APPD	V.M.Selvaraaj		04-07-15	

DEPT. : C & I	ALL DIMENSIONS ARE IN MM	SCALE	WEIGHT (Kg)	REF TO ASSY / OLD DWG	ITEM NO	No OF ITEMS
CODE : 392		NTS	——	—	—	—

TITLE: TERMINAL BLOCK DIAGRAM FOR PNEUMATIC ACTUATOR WITH SMART POSITIONER
Sheet 01 of 01

CARD CODE: U 01

DRAWING NO : 3-97-599-22899

REV: 00

File Name : STDPCTB3

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

TECHNICAL DELIVERY CONDITIONS

FOR SUB - DELIVERY COMPONENTS OF

CONTROLS AND INSTRUMENTATION

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 atmospbere 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 : ≤ 0.1% of span, Characteristic deviation : ≤ 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	¼" 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.

BHEL	**CHECK LIST FOR SH/RH BLOCK/CONTROL VALVES AND SBPRV**	SPEC. NO. : _CHKLIST	
		SECTION: Boiler Mountings/PE (FB)	
		REV NO.: 00	Date:29-10-2015
		SHEET : 1 OF 1	

CUSTOMER NAME : NEYVELI **CUST. Nos.0683 &0684**

Vendor should submit this **Filled up** Check list along with Technical and Unpriced Offer during Initial Offer submission and with each Revised Submission . Put tick mark " √ " in appropriate boxes relevant to the submission. Indicate Revision Number in case of revised submission. Offer will not be evaluated without receipt of filled up Check list signed and company seal affixed .

SL NO	ENCLOSURES / DETAILS FURNISHED	FIRST SUBMISSION REV 00	REVISED SUBMISSION REV____
01	Completely Filled up **BHEL Datasheets** for all services clearly indicating Vendor name, models, size, Rating, Materials, Cv, Lift%, Valve weight etc with vendor signature and Company seal.	YES ☐ NO ☐	YES ☐ NO ☐
02	Valve & Accessory models like Actuator, Positioner, Air lock, Limit switch, Position Transmitter, Solenoid valve, I/P Converter, Terminal Box etc. offered meets all the Specification indicated in BHEL datasheets and accepting IBR Form-IIIC submission.	YES ☐ NO ☐	YES ☐ NO ☐
03	Valves can be directly welded to connecting line sizes indicated in BHEL Datasheets without reducers	YES ☐ NO ☐	YES ☐ NO ☐
04	Lift % vs. Cv% curve for each and every valve model offered (Excluding Block Valve).	YES ☐ NO ☐	YES ☐ NO ☐
05	Terminal Box wiring diagram (For Pneumatic Actuators)	YES ☐ NO ☐	YES ☐ NO ☐
06	Vendor's Pneumatic Hookup diagram as applicable for each service considering whether actuator is Single Acting or Double Acting	YES ☐ NO ☐	YES ☐ NO ☐
07	Sizing Calculations showing Formula used with variables and constants for each of the following: i) Cv sizing for all services ii) Actuator sizing for all services iii) Noise calculation for control valves iv) Cavitation check calculation for SH/RH Spray control valves v) Valve outlet velocity calculation	 YES ☐NO ☐ YES ☐NO ☐ YES ☐NO ☐ YES ☐NO ☐ YES ☐NO ☐	 YES ☐NO ☐ YES ☐NO ☐ YES ☐NO ☐ YES ☐NO ☐ YES ☐NO ☐
08	Valve and All Accessory catalogs if models are revised or these are offered for the first time.	YES ☐ NO ☐	YES ☐ NO ☐
09	The Quantities, Models and other vendor indicated details in **Quotation (Unpriced Bid)** are matching with BHEL Enquiry Sl.Nos. Quantities and those filled in BHEL Datasheets	YES ☐ NO ☐	YES ☐ NO ☐
10	Duly filled up "BHEL Special Contract Requirements" with Vendor Seal and Signature **(If applicable and sent by BHEL)**	YES ☐ NO ☐	YES ☐ NO ☐
11	ELECTRICAL ACTUATOR DETAILS (If applicable for this project) 1) Electrical Actuator –vendor wiring diagram 2) Actuator vendor's datasheets 3) BHEL datasheets for actuator	YES ☐ NO ☐	YES ☐ NO ☐
	VALVE VENDOR NAME :		
	SIGNATURE OF COMPANY REPRESENTATIVE WITH DATE :		
	SEAL OF COMPANY REPRESENTATIVE :		

NB: STRIKEOUT WHICHEVER IS NOT APPLICABLE

STANDARD QUALITY PLAN FOR CONTROL VALVES (STEAM & WATER APPLICATIONS)

Prepared By **Quality Assurance**	VENKANNA RUPANI	R. Venkanna 14/09/2015

Reviewed by	Signature
Quality Assurance G. PANNEER SELVAM	14/09/15
Engineering K. SRIDHARAN	16/09/15
Materials Management/BOI K. UDAYA KUMAR	16/9/15
Quality Control R. DHARMAR	15/09/15

Rev No	Date	Approved by	Signature
00	14/09/2015	AGM / QA & BE	

Record of Revisions

Rev No	Details of Revision	Remarks
00	Fresh Issue	

बी एच ई एल BHEL	MANUFACTURER'S NAME & ADDRESS: BHEL TIRUCHIRAPPALLI APPROVED SUPPLIERS	**STANDARD QUALITY PLAN** **PRODUCT: CONTROL VALVES – STEAM & WATER APPLICATIONS (SH, RH SPRAY BLOCK; SB PRESSURE REDUCING; WARM KEEPING LEVEL; START-UP SYSTEM:SEPARATOR LEVEL & MINIMUM ECONOMIZER FLOW)** **SUB-SYSTEM :Steam Generator Package**	QWI NO:SQP:SD:06 REV.NO.00 DATE: 14/09/2015 PAGE: 2 OF 5

SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
											M	C	N	
1	2	3	4	5	M	C/N	7	8	9	D*	** 10			11
1.0	**RAW MATERIALS & BOUGHT OUT ITEMS**													
1.1	Body, Bonnet, inlet & outlet nozzles (if applicable)	Chemical & Mech Properties, Heat treatment, Hardness@	B	TC Verification	1/Heat	1/Heat	BHEL approved datasheet/ ASTM Std	BHEL approved datasheet / ASTM Std	MTC	√	P	V	V	@on Gr 91 materials only.
		Surface quality*	B	Visual Examination	100%	100%	MSS SP 55	MSS SP 55	MTC	√	P	V	V	*on castings.
		Internal Soundness for class rating ≥ 900 (RT/UT#)	B	TC Verification	100%	100%	ASME Sec V	RT: ASME B16.34 Appendix I/ UT: ASME B16.34 Appendix IV	MTC	√	P	V	V	#RT as per ASME B16.34; UT for forgings of dia/thick ≥50mm.
		#Sub-Surface Soundness(MPI)	B	TC Verification	100%	100%	ASME Sec V/ ASTM E709	ASME B 16.34 Appendix II	MTC	√	P	V	V	#On accessible areas.
1.2	Trim(Plug, Seat ring & Stem)	Chemical & Mechanical Properties, Hardness@	B	TC Verification	1/Heat	1/Heat	BHEL approved datasheet / ASTM Std	BHEL approved datasheet / ASTM Std	MTC	√	P	V	V	@on Gr 91 materials only.
		Stem Internal Soundness(UT#)	B	TC Verification	100%	100%	ASME Sec V/ ASTM A 388	ASME B 16.34 Appendix IV	MTC	√	P	V	V	#UT for dia/ thick ≥50mm
1.3	Pressure retaining fasteners	Chemical, Mechanical Prop & Dimensions	B	TC Verification	1/Heat	1/Heat	BHEL approved datasheet /ASTM Std	BHEL approved datasheet /ASTM Std	MTC/ COC	√	P	V	V	
1.4	Diaphragm/ Piston Cylinder, if applicable	Surface Quality, Strength & %Elg, Hardness, *, Endurance Life, Dimensions	B	Visual & Measurement	1/ Lot 100%	1/ Lot 100%	Manufacturer's Specification 10,000 Cycles	Manufacturer's Specification No damage	COC	√	P	V	V	*property change after heat aging.
1.5	Springs, if applicable	Chemistry, Strength, Hardness, Endurance*, Scragging, Linearity & Dimensions	B	Chemical Analysis, Compression & Load test, Measurement, Cyclic Test, Measurement	1/ Lot	1/ Lot	Manufacturer's Specification 10,000 Cycles	Manufacturer's Specification No damage	COC	√	P	V	V	*including stiffness ratio.

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											M	C	N	
1	2	3	4	5	M	C/N	7	8	9	D*	** 10			11
1.6	Pressure Gauges, if applicable	Rating/Range, Performance	B	Visual, Calibration	100%	100%	Manufacturer's Specification	Manufacturer's Specification	IR/COC	√	P	V	V	
1.7	**Accessories:** Solenoid valve, limit switch, ALR, junction box, positioner & transmitters, etc.#	Make/rating/type; Degree of protection(as applicable)*	B	Verification	100%	100%	BHEL approved datasheet	BHEL approved datasheet	COC & Certificates *	√	P	V	V	#BHEL approved makes. *For electrical items, certificates by statutory bodies shall be furnished.
2.0	**INPROCESS INSPECTION**													
2.1	Welding Qualifications, if welding is involved	Procedure	B	Document Review	100%	100%	ASME Sec IX	ASME Sec IX	PQR & WPS	√	P	V	V	# ASME Sec IX for BHEL export boilers only
		Personnel #	B	Document Review	100%	100%	IBR/ ASME Sec IX#	IBR/ ASME Sec IX #	WPQ	√	P	V	V	
2.2	PWHT, if applicable	Time & Temp control	B	Review of HT Chart	100%	100%	WPS & IBR	WPS & IBR	HT Chart	√	P	V	V	
2.3	Hard faced Trims	Hardness	B	Measurement	On test samples only		BHEL approved datasheet / Mfg Std	BHEL approved datasheet / Mfg Std	Test Report	√	P	V	V	
2.4	Body, Bonnet, Plug, Seat Rings & Stems after machining	Surface quality, Dimensions including profile check	B	Visual & Measurement	100%	--	Manufacturer's Drawing	Manufacturer's Drawing	--	-	P	--	-	
2.5	Lapping*	M/c surface contact	B	Visual	1/Heat		---	Proper Physical contact	Test Report	-	P	-	-	*for rotating stem valves.
2.6	NDE on hard faced trims	Weld Soundness	B	LPI	100%	100%	ASME E165	ASME Sec VIII Div 1 Appd 8.4	Test Report	√	P	V	V	
2.7	NDE on butt weld joints	Weld Soundness	B	RT/UT	100%	100%	ASME Sec V	ASME Sec I	Test Report	√	P	V *	V	*Film Review
2.8	NDE on butt weld ends	Soundness of edges after m/c	B	LPI	100%	100%	ASME Sec V	ASME Sec VIII Div 1 Appd 8.4	Test Report	√	P	V	V	
2.9	Body & Bonnet	Leak tightness & pressure resistance	A	Hydro Test	100%	-	ASME 16.34/ ISA 75.19	No Leak	Register/ Log	--	P	-	-	
2.10	Hardness on Gr 91 welds	Hardness	B	Measurement	100%	10%	Manufacturer's standard	186-300 BHN	Test Report	√	P	W	V	

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											M	C	N	
1	2	3	4	5	M	C/N	7	8	9	D*	** 10			11
3.0	**FINAL INSPECTION & TESTING**													
3.1	Performance Test on assembled valves fitted with all accessories	Leak tightness & pressure resistance of Body & Bonnet joint	A	Hydro Test	100%	10%	ASME 16.34/ ISA 75.19	No Leak	Test Report	√	P	W	V	IBR Form III C shall be submitted
3.2		Leak through seat	A	Seat Leak Test (Air/Hydro test)	100%	10%	FCI 70.2 /BHEL approved datasheet	FCI 70.2 /BHEL approved datasheet	Test Report	√	P	W	V	
3.3		Travel, linearity, hysteresis, valve opening & closing time, fail safe feature, functioning of all accessories.	A	Performance/ Calibration Test	100%	10%	IEC 60534-4/ BHEL approved datasheet	BHEL approved datasheet	Test Report	√	P	W	V	
3.4		Packing Tightness*	A	Packing Leak Test	100%	10%	ASME B16.34/ BHEL approved datasheet	ASME B16.34/ BHEL approved datasheet	Test Report	√	P	W	V	*can be done during hydro test (Cl 3.1)
3.5		Control valve flow Capacity# (Discharge Vs Opening)	A	Capacity Test (Cv test)	1/Type	1/Type	BHEL approved datasheet /ISA 75.02	ISA 75.11	Test Report#	√	P	V #	V	#Type test witnessed by BHEL or done at FCRI shall be submitted for review & clearance by BHEL Engg (certificate valid for 5 years).
3.6		Actuator chamber-Strength & leakage	B	Air Leak Test	100%	10%	Manufacturer's std	No leak when tested @ 1.5 times supply press or 60 psi max.	Test Report	√	P	W	V	
3.7	Actuator & Positioner	Model, Sl No, Qty, Rating	B	Visual & Document Review	100%	10%	BHEL approved datasheet	BHEL approved datasheet	Test Report/ COC	√	P	W	V	
3.8	Final Inspection	Overall Dimensions*	B	Measurement	100%	10%	BHEL approved GA Drawing	BHEL approved GA Drawing	Test Report	√	P	W	V	*including OD, d1, thickness, etc.

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											M	C	N	
1	2	3	4	5	M	C/N	7	8	9	D*	** 10			11
4.0	**PAINTING, PRESERVATION & PACKING**													
4.1	Painting	Surface Prep, Primer & finish coats &Shade, DFT	B	Visual & Measurement	100%	100%	BHEL approved painting Scheme	BHEL approved painting Scheme	Test Report	√	P	V	V	
4.2	Identification #	Marking /Name Plate & Tagging	B	Visual	100%	100%	BHEL Spec & PO	BHEL Spec & PO	Test Report	--	P	V	V	#with IBR stamp
4.3	Packing*	Cleanliness, Water-proof packing & Stability	B	Verification	100%	100%	Manufacturer's practice	Manufacturer's practice	Packing List	√	P	V	V	*with site storage & handling instructions.
4.4	Spare Parts	Parts, Type, Qty, Dimensions, etc.	B	Visual & Measurement	100%	100%	BHEL approved datasheet & PO	BHEL approved datasheet & PO	IR/COC	√	P	V	V	

Note: 1. Customer verification stages specified above shall be followed. Any witness stages shall be as specified/indicated in BHEL PO.

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