



An ISO 9001
Company

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

Annexure – A- Terms and Conditions

ACCEPTANCE OF TECHNO - COMMERCIAL TERMS AND CONDITIONS BY THE BIDDERS

Description of the Equipment:	SH/RH Spray Control and Block Valves along with commissioning and Mandatory spares for Patratu Project	
Projects	Patratu 3x800MW Project	
BHEL Tender No. & Date	1802000490 dated 08.08.2020	
Name of the firm (Bidder)	:	
Address	:	
Contact details	<u>Contact person 1</u> Name: Designation: Office Phone: Mobile: e-mail: <u>Contact person 2</u> Name: Designation: Office Phone: Mobile: e-mail:	
<i>To be filled by bidder</i>		
Sl. No.	Terms and conditions	Vendor's confirmation
1 (a)	Technical: Supply of SH/RH Spray Control and Block Valves along with commissioning and mandatory spares for boiler application shall be as per the Specification attached with the enquiry. 1. Data sheets for SH/RH Spray BV/CV 2. Pneumatic Hookup diagram for SH/RH Spray BV/CV 3. TB diagram (3-97-599-24078) for ref only 4. Specification for Block & Control valves 5. Check list for SH/RH Block/Control valves 6. Specification for smart positioner 7. C&I specification for control valve accessories	
1 (b)	Pre-qualification requirement: Offer shall be considered only if bidder is meeting Tender Prequalification requirement (Annexure-B). Vendor to comply with Pre-Qualification requirement of the tender and submit along with their technical bid - the credentials and other documents as indicated in the PQR in the format prescribed. Otherwise their offer may get rejected.	

1 (c)	Evaluation method Total requirement will be considered as a package for evaluation and ordering. Evaluation shall be on total cost to BHEL basis .	
1 (d)	Vendor shall quote as per attached price and Unpriced Schedule format only.	
1 (e)	Vendor offers will considered for price bid opening subject to fulfilment of techno commercial suitability and vendor approval by BHEL and end customer.	
1 (f)	Inspection by BHEL/ BHEL approved TPIA/NTPC CV test report to be submitted for BHEL review and approval before final inspection.	
2 (a)	Firm Price: The quoted / finalised rates shall be Firm till execution of the supplies. Offer with PVC clause will not be considered.	
2 (b)	The Tender will be operated in two part bid system. One-part consisting of Technical bid with Commercial terms & conditions and other part is Price Bid. Based on the above and other conditions, as well as technical capability, vendors will be short-listed. The Techno-commercial bid will be opened on the due date and based on the suitability of techno-commercial bid, the price Bid of the techno-commercial suitable qualified vendors will be considered and opened on a suitable date with due intimation to vendors.	
3 (a)	Delivery term: The quote shall be on FOR destination basis as indicated below inclusive of Packing, forwarding, Freight also to yours account. - For Main supply and commissioning spares (RFQ Sl. No. 10 to 270):- FOR Patratu Project site. - For Mandatory spares (RFQ Sl. no. (280 to 910) :- FOR BHEL Trichy stores. - Transit Insurance is under BHEL scope @0.12%.	
4 (a)	Payment terms: For Main supply and commissioning spares: Payment term is 100% direct payment after 60 days from the date of dispatch against site acknowledgement and against 10% PBG valid for the warranty period. For Mandatory spares: Payment term is 100% direct EFT payment after 60 days from the date of receipt and acceptance of materials and against 10% PBG valid for the warranty period, wherever necessary.	
4 (c)	Payment Terms (New Suppliers) For new suppliers not registered with BHEL, Trichy for the product, Payment shall be made 60 days after receipt and acceptance of materials.	
4 (d)	Loading Criteria No deviation is permitted in payment term.	
4 (e)	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 banks mentioned under List of Consortium Banks attachment. All banks charges shall be to vendor account only. Any deviation on PBG leads to rejection of offer.	
5 (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 0.5% of the undelivered portion per week of the delay or part thereof subject to a maximum of 10% of the total order value. In case of PO placements, required documents have to be submitted for approval within 15 days from the date of PO & reply for any further clarification has to be within 7 days. Any delay beyond the above specified period will be considered during LD calculation.	
5 (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.	
6 (a)	Guarantee / Warranty Period: Guarantee clause 24 months from the date of supply or 18 months from the date of actual put in use, whichever is earlier.	
6 (b)	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.	
6 (c)	Loading Criteria: Guarantee / Warranty Period: No Deviation is permitted. If still vendor offered any deviation on the Guarantee / warranty period, it may lead to rejection of offer.	
7 (a)	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 Tiruverumbur. BHEL TRICHY Unit GST NO : 33AAACB4146P2ZL.	
7 (b)	Kindly indicate the GST No of your Firm	
7 (c)	Kindly Indicate the HSN Code for all items	
7 (d)	Please indicate the applicable GST % (IGST)	
8	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.	
9	Staggered Delivery Period: The total requirement is for three units of Patratu project. Our delivery requirement for Unit-I is 24 weeks from the Documents approval by NTPC /BHEL. For subsequent units the delivery requirement will be as per the below requirement or 24 weeks from document approval by NTPC, whichever is later. Unit-II & Mandatory spares: September 2021 Unit-III: March 2022 Dispatches shall be unit wise only after obtaining clearance from BHEL Trichy	
10	LR date will be considered for LD calculation.	
11	Documents are to be submitted along with technical bid (Part-1) 01. Covering letter 02. Unpriced offer. 03. Filled technical specification 04. Filled BHEL Terms and condition sheet (Annexure-A) 05. Filled Annexure-B PQR along with supporting documents. 06. Catalogue's 07. Detailed BOQ of the package. 08. Third party non-disclosure agreement 09. Self-Certification as per Make In India clause 10. MSE Certificates (if applicable) Documents are to be submitted along with Price bid (Part-2) 01. Priced offer Note: All the pages of documents are to be signed and stamped by authorized signatory of the company. Any query during enquiry stage shall be replied within three days failing which offer may be rejected as non-responsive.	
12	Offer Validity: 120 days minimum from techno commercial bid opening (Part-1)	
13	Inspection and testing requirements: Inspection and testing requirements are to be carried out as per the specification and BHEL/Customer approved Drawing (All documents shall be submitted within 15 days from the date of PO for our approval), Technical spec &QP and all test certificates are to be submitted in complete set. Inspection notice period: For TPI inspector visit to vendor works, a minimum of 3 working days' notice period.	
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.	
15	Response to Tenders for Indigenous supplier will be entertained only if the vendor has a valid GST registration number which should clearly have mentioned in the offer. If any specific exemption is available, a	

	declaration with due supporting documents need to be furnished for considering the offer.	
16	Supplier shall mention their GSTN registration number in all their invoices and invoices shall be in the format as specified/prescribed under GST laws. Invoices shall necessarily contain Invoice number (in case of multiple numbering system is being followed for billing like SAP invoice no, commercial invoice no etc., then the Invoice No which is linked/uploaded in GSTN network shall be clearly indicated), item description as per PO, Quantity, Rate, Value, applicable taxes with nomenclature (like IGST, SGST, CGST & UTGST) separately, HSN/ SAC Code, etc.	
17	All invoices shall bear the HSN Code for each item separately (Harmonized System of Nomenclature)/ SAC code (Services Accounting Code).	
18	Invoices will be processed only upon completion of statutory requirement and further subject to following: • Vendor declaring such invoice in Form GST ANX-1 • Receipt of Goods or Services and Tax invoice by BHEL	
19	As the continuous uploading of tax invoices in GSTN portal (in GST ANX-1) is available for all (i.e. both Small & Large) tax payers under proposed new GST Return System, all invoices raised on BHEL may be uploaded immediately in GST portal on despatch of material /rendering of services. The supplier shall ensure availability of Invoice in GST portal before submission of invoice to BHEL. Invoices will be admitted by BHEL only if the invoices are available in GSTN portal (in BHEL's GST ANX-2).	
20	In case of discrepancy in the data uploaded by the supplier in the GSTN portal or in case of any shortages or rejection in the supply, then BHEL will not be able to avail the tax credit and will notify the supplier of the same. Supplier has to rectify the data discrepancy in the GSTN portal or issue credit note or debit note (details also to be uploaded in GSTN portal) for the shortages or rejections in the supplies or additional claims, within the calendar month informed by BHEL.	
21	In cases where invoice details have been uploaded by the vendor but failed to remit the GST amount to GST Department (Form PMT-08 or Form GST RET-01 to be submitted) within stipulated time, then GST paid on the invoices pertaining to the month for which GST return not filed by the vendor will be recovered from the vendor along with the applicable interest (currently 24% p.a) and all subsequent bills of the vendor will not be processed till filing of the GST return by the vendor	
22	In case GST credit is denied to BHEL due to non-receipt or delayed receipt of goods and/ or tax invoice or expiry of timeline prescribed in GST law for availing such ITC, or any other reasons not attributable to BHEL, GST amount claimed in the invoice shall be disallowed to the vendor.	

23	Where any GST liability arising on BHEL under Reverse Charge (RCM), the vendor has to submit the invoices to BHEL well within the timeline prescribed in GST Law, to enable BHEL to discharge the GST liability. If there is a delay in submission of invoice by the vendor resulting in delayed payment of GST by BHEL along with Interest, then such Interest payable or paid shall be recovered from the vendor.	
24	Under GST regime, BHEL has to discharge GST liability on LD recovered from suppliers/contracts. Hence applicable GST shall also be recoverable from suppliers/contractors on LD amount. For this Tax Invoice will be issued by BHEL indicating the respective supply invoice number.	
25	GST TDS will be deducted as per Section 51 of CGST Act 2017 and in line with Notification 50/2018 – Central Tax dated 13.09.2018. GST TDS certificate which will be generated in GST portal subsequent to vendor accepting the TDS deduction in the GST portal, will be issued to the vendor.	
26	A declaration to the effect that all invoice particulars are/were uploaded in the GSTN network/ portal & all tax liability as per GST rules and regulations have been and will be discharged, shall be mentioned in the invoice. If not mentioned in the invoice, a separate declaration shall be submitted as per the requirement of BHEL	
27	MSE VENDOR: <i>i. If L1 vendor is an MSE vendor entire project package will be ordered on L1 vendor.</i> <i>ii. If a Non MSE vendor is coming as L1, then L1 prices will be counteroffered on MSE vendor who is quoting price within the price band L1+15% and if they are agreeing, purchase order will be awarded for full/complete supply of total tendered value to MSE.</i> <i>iii. If more than one MSE vendors are available in the L1+15% price band then lowest of the MSE vendor will be selected for counteroffering. If lowest MSE vendor is not accepting it will be counteroffered to the next MSE vendor in the price band and so on.</i> <i>iv. Finally if none of the MSE vendor in the price band is not accepting it will be ordered on L1 non MSE vendor.</i> Payment for MSE Indigenous vendors will be as per MSMED Act, 2006 Declaration of UAM number by MSE bidders is mandatory. Failing which, such bidders will not be able to enjoy the benefits as per Public Procurement Policy for MSEs Order, 2012. MSE suppliers can avail the intended benefits only if they submit along with the offer, attested/notarized copies of either	

1. EM II certificate having deemed validity (five years from the date of issue of acknowledgement in EM II) **or**
2. 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 limits 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 (Part 1 in case of two part bid).

Non submission of such documents will lead to consideration of their bid at par with other bidders. No benefit shall be applicable for this enquiry, in case of any deficiency in the above required documents or in case the documents are not submitted before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required documents are to be uploaded on the portal even if submitted earlier.

Documents should be notarized or attested by a Gazetted officer.

Definitions of MSEs owned by SC/ST is under:

- ***In case of proprietorship firm, proprietor must be SC/ST.***
- ***In case of partnership firm, the SC/ST partners must be holding at least 51% shares in the unit.***
- ***In case of private limited companies, at least 51% share must be held by SC/ST promoters.***

Authorised Offices to Issue SC/ST certificate.

The caste/Tribe/Community certificate issued by the following authorities in the prescribed form for SCs/STs can be considered.

- District Magistrate / Additional District Magistrate / Collector / Deputy Commissioner / Additional Deputy Commissioner / Deputy Collector / 1st class stipendiary magistrate / Sub divisional Magistrate / Taulka Magistrate / Executive magistrate / Extra Assistant commissioner.
- Chief Presidency magistrate / Additional chief presidency magistrate/Presidency magistrate.
- Revenue Officer not below the rank of thasildar.
- Sub-Divisional officer of the area where the individual and / or his family normally resides.

To avail the benefits of MSE under SC/ST category, the related documents as stated above should be submitted along with tender documents.

In addition Udyam Registration certificate shall be submitted by MSE vendors.

28	<u>Make in India:</u> For this procurement, the local content to categorize a supplier as a Class I local supplier/ Class II local Supplier/ Non- Local supplier and purchase preference to Class I local supplier, is as defined in Public Procurement (Preference to Make in India), Order 2017 dated 04.06.2020 issued by DPIIT. In case of subsequent orders issued by the nodal ministry, changing the definition of local content for the items of the NIT, the same shall be applicable even if issued after issue of this NIT, but before opening of Part-II bids against this NIT. The local supplier at the time of tender, bidding or solicitation shall be required to provide self-certification that the item offered meets the minimum local content and shall give details of the location(s) at which the local value addition is made.	
29	<u>Fraud Prevention Policy</u> 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.	
30	<u>Cartel Formation</u> All the firms should desist from forming cartel as the practice is prohibited under Section 3(3) (a) & (d) of the competition Act 2002. If any such instance is observed during this tender will attract disciplinary action as per BHEL policies.	
31	<u>Resolution of Disputes</u> a. If dispute or difference of any kind shall arise between the Purchaser/Consignee and the supplier in connection with or relating to the contract, the parties shall make every effort to resolve the same amicably by mutual consultations. b. Venue of Arbitration: The venue of arbitration shall be the place from where the contract has been issued, i.e., BHEL Trichy. c. Jurisdiction of the court will be from the place where the tender enquiry document has been issued, i.e., Trichy, India	
32	<u>Force Majeure clause</u> a. Notwithstanding the provisions contained in other clauses, the supplier shall not be liable for imposition of any such sanction so long the delay and/or failure of the supplier in fulfilling its obligations under the contract is the result of an event of Force Majeure. For purposes of this clause, Force Majeure means an event beyond the control of the supplier and not involving the supplier's fault or negligence and which is not foreseeable and not brought about at the instance of the party claiming to be affected by such event and which has caused the non – performance or delay in performance. Such events may include, but are not restricted to, wars or revolutions, hostility, acts of public enemy, civil commotion, sabotage, fires,	

	floods, explosions, epidemics, quarantine restrictions, strikes excluding by its employees, lockouts excluding by its management, freight embargoes and Acts of GOD. b. If a Force Majeure situation arises, the supplier shall promptly notify the Purchaser/Consignee in writing of such conditions and the cause thereof within twenty-one days of occurrence of such event. Unless otherwise directed by the Purchaser/Consignee in writing, the supplier shall continue to perform its obligations under the contract as far as reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event. c. If the performance in whole or in part or any obligation under this contract is prevented or delayed by any reason of Force Majeure for a period exceeding sixty days, either party may at its option terminate the contract without any financial repercussion on either side. d. In case due to a Force Majeure event the Purchaser/Consignee is unable to fulfil its contractual commitment and responsibility, the Purchaser/Consignee will notify the supplier accordingly and subsequent actions taken on similar lines described in above sub-paragraphs.	
Note	1. In the event of our customer order covering this tender being cancelled /placed on hold / otherwise modified, BHEL would be constrained to accordingly cancel / hold / modify the tender at any stage of execution. 2. BHEL may negotiate the L1 rate, if not meeting our budget / estimated cost. BHEL may re-float the tender opened, if L1 price is not acceptable to BHEL. Any deviation in specified commercial terms- Annexure-A, will lead to rejection of offer. 3. Any other Techno –Commercial Terms indicated by the vendor in their offer elsewhere will be ignored. BHEL will proceed with tender evaluation as per Annexure A only.	

BHEL TRICHY
MM/BOI
ANNEXURE – B
Pre-Qualification requirements (PQR)

Sl.NO	Description	Vendor Confirmation
1	The bidder should have supplied globe type control valves with size 4-inch (NB100) or higher with the required valve material (A217 WC9 or superior material), minimum rating as per this specification requirement (ANSI 2438STD/2112SPL) and block valves with size 6-inch (NB150) or higher with the required valve material (A216 WCB/WCC or superior material), minimum rating as per this specification requirement (ANSI 2438STD/2034SPL). The valves should have been commissioned in at least one plant of super critical steam generating unit with an operating pressure more than 255 kg/cm ² (Pressure at Super Heater outlet) in similar applications mentioned in our specification and are in successful operation for a period of not less than 1 year as on the date of techno-commercial bid opening.	
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 pre-qualification requirement (cl. no 1).	
3	The supplier has to submit any of the following supporting documents meeting above mentioned above pre-qualification requirement (cl. no 1). Copy of minimum one (1) performance certificate in English from end user along with copy of related PO/LOI/LOA/WO specifying that the product / equipment is running successfully for one (1) year from date of commissioning meeting the pre-qualification requirement. OR Minimum two PO/LOI/LOA/WO placed with a minimum gap of one (1) year from same purchaser meeting the pre-qualification requirement. OR Minimum three customer's/ third party's inspection reports/ test certificates/ commissioning certificates meeting the pre-qualification requirement.	

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

ABBREVIATION:

(PO) - Purchase order, (LOI) letter of intent, (LOA) letter of award, (WO) work order



DATA SHEET FOR CONTROL VALVES (WITH PNEUMATIC ACTUATOR)

SPECIFICATION NO.: PATRATU

VOLUME

SECTION: Boiler mountings/PE (FB)

REV. NO. 00 DATE : 02.08.19

SHEET 1 OF 2

Customer Nos. : 1828,1829,1830

Tag Nos.: LAE70AA201

Qty.: 1 No. / BOILER

SH DESH #1 COMMON LINE BLOCK VALVE DATA SHEET – A&B

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 SERVICE LOCATION DUTY PIPE SIZE (Inlet / Outlet) PIPE MATERIAL (Inlet / Outlet) MEDIUM	PATRATU STPS EXP. (3X800 MW) SH SPRAY COMMON BLOCK VALVE OUTDOOR ON-OFF D168.3 x 26 / D168.3 x 26 SA106 Gr. C / SA106 Gr.C FEED WATER	
	MODEL NO. TYPE OF BODY: GUIDING:NO. OF PORTS BODY SIZE:PORT SIZE:DESIGN CV END CONNECTION & RATING (ANSI) BODY MATERIAL PACKING MATERIAL BONNET TYPE TRIM FORM TRIM MATERIAL: SEAT: PLUG: CAGE: STEM: BALANCED / UNBALANCED FLOW VALVE OUTLET VELOCITY REQUIRED LEAKAGE CLASS NOISE LEVEL (dBA) ANTI CAVITATION TRIM VALVE LIFT mm	GLOBE / TOP / CAGE / ONE BUTT WELDED; style-P; d1=122.8mm A216 WCB / WCC GRAFOIL EXTENDED / FINNED QUICK OPEN (ON / OFF) BELOW SEAT / ABOVE SEAT < 8 m/s V LESS THAN 85 dBA at 1 m	
PNEUMATIC ACTUATOR	MODEL NO. & SIZE CLOSE AT: OPEN AT (Kg/cm ² (g)) TRAVEL TIME FOR OPEN TO CLOSE, CLOSE TO OPEN VALVE POSN. ON SIGNAL AIR FAILURE VALVE POSN. ON SUPPLY AIR FAILURE	<10 Secs / <10 Secs NOT APPLICABLE STAY PUT	
PERFORMANCE OF VALVE	LINEARITY HYSTERESIS SENSITIVITY ACCURACY (OVERALL)	± 2% ± 5% ± 0.5% ± 2%	

SERVICE CONDITIONS

Sl. NO.	LOAD	FLOW T/h	INLET PR. kg/cm ² (g)	OUTLET PR. kg/cm ² (g)	PR. DROP kg/cm ² (g)	INLET TEMP(°C)	SP. GRAVITY	CALC. CV	VALVE LIFT %	VALVE OUTLET VELOCITY	NOISE LEVEL Dba
1	Design condition	195.8.	334.5	333.21	1.29	296					
2	100% BMCR	67.6	336.2	336.05	0.15	296					
3	100% TMCR	61.4	324.5	324.37	0.13	292					
4	75% TMCR	48.7	248.7	248.62	0.08	275					
5	60% TMCR	45.0	224.7	224.63	0.07	269					
6	50% TMCR	34.8	163.3	163.26	0.04	251					
7	40% TMCR	30.9	142.3	142.27	0.03	240					
8	HPH out condition	58.3	311.0	310.90	0.10	198					
9	Min flow condition	14.9	163.3	163.29	0.01	251					

ACTUATOR SIZING PRESSURE

: 357.5 kg/cm²(g)

BODY DESIGN: PRESSURE / TEMPERATURE

: 357.5 kg/cm²(g) / 296 °C

IBR FORM-III C

: REQUIRED

TOTAL WEIGHT (VALVE+ACTUATOR+ACCESSORIES)

: kg

Valves should be directly weldable to connecting pipe without the use of Reducers. Only Globe / Inline Valves acceptable. Angle Valves not acceptable.

	DATA SHEET FOR CONTROL VALVES (WITH PNEUMATIC ACTUATOR)		SPECIFICATION NO.: PATRATU	
			VOLUME	
			SECTION: Boiler mountings/PE (FB)	
			Rev. No. 00	DATE: 02.08.19
SHEET 2 OF 2				
Customer Nos.: 1828,1829,1830		Tag Nos.: LAE70AA201		Qty.: 1 No. / BOILER
SH DESH #1 COMMON LINE BLOCK VALVE DATA SHEET – A&B				
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	NOT REQUIRED REQUIRED REQUIRED REQUIRED NOT REQUIRED REQUIRED NOT REQUIRED REQUIRED REQUIRED REQUIRED REQUIRED / NOT REQUIRED		
POSITIONER	MANUFACTURER & MODEL NO. BYPASS: GAUGES: ENCLOSURE CLASS INPUT SIGNAL IN kg/cm ² (g) OUTPUT SIGNAL	YES / NO / TWO : IP-65 4 - 20mA, 24 V DC TO SUIT ACTUATOR	NOT APPLICABLE	
AIR FILTER REGULATOR	MANUFACTURER & MODEL NO. AIR SUPPLY PRESSURE IN kg/cm ² (g) OUTPUT PRESSURE IN kg/cm ² (g) OUTPUT GAUGE	3.0 TO 5.0 TO SUIT ACTUATOR REQUIRED		
AIR LOCK	MANUFACTURER & MODEL NO. SET PRESSURE IN kg/cm ² (g) SUPPLY PRESSURE IN kg/cm ² (g) RESET TYPE VENT PLUG	3.0 TO 5.0 AUTO		
LIMIT SWITCH	MANUFACTURER & MODEL NO. OPEN: INT: CLOSE CONTACT TYPE RATING (AC/DC) ENCLOSURE CLASS	1 NO.FOR OPEN & 1 NO. FOR CLOSE DPDT(2NO + 2NC CONTACTS) 3A 240V AC AND 0.1A 220V DC IP65		
POSITION TRANSMITTER	MANUFACTURER & MODEL NO. TYPE SUPPLY OUTPUT RATING ACCURACY ENCLOSURE CLASS	INBUILT IN SMART POSITIONER	NOT APPLICABLE	
SOLENOID VALVE	MANUFACTURER & MODEL NO. RATING OPERATION / 4 WAY, DUAL COIL COIL INSULATION CLASS ENCLOSURE CLASS	24V, DC STAYPUT / 4WAY,DUAL COIL CLASS-H IP65 / NEMA4		
HANDWHEEL	ORIENTATION	SIDE MOUNTED		
JUNCTION BOX	TYPE / NO. OF WAYS / SIZE CABLE GLANDS: (SIZE / QTY) METHOD OF TERMINATION ENCLOSURE CLASS	CAGE CLAMP / THIRTY SIX / 2.5 SQ.MM REQUIRED : 16MM / 3 NO. / BRASS WITH NICKEL PLATED / BOTTOM 3 NO 9 PIN PLUG & SOCKET(2 WIRED, 1 LOOSE) IP65		
I/P CONVERTER (FAIL FREEZE TYPE)	INPUT SIGNAL : POWER SUPPLY SPLIT RANGE ENCLOSURE CLASS	INBUILT IN SMART POSITIONER	NOT APPLICABLE	
AIR CONNECTION SIZE SHOULD BE 1/2NPT(F)				
SIGN: NAME: DATE:	PREPARED BY  S.J.P.J. 02.08.19	CHECKED BY  A.JAIGANESH 02.08.19	APPROVED BY  V.GUNASEKARAN 02.08.19	VENDOR SEAL SIGN: NAME: DATE:



DATA SHEET FOR CONTROL VALVES (WITH PNEUMATIC ACTUATOR)

SPECIFICATION NO.: PATRATU

VOLUME

SECTION: Boiler mountings/PE (FB)

REV. NO. 00

DATE : 02.08.19

SHEET 1 OF 2

Customer Nos. : 1828,1829,1830

Tag Nos.: *

Qty.: 4 Nos. / BOILER

SH DESH #1 BRANCH BLOCK VALVE DATA SHEET – A&B

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 SERVICE LOCATION DUTY PIPE SIZE (Inlet / Outlet) PIPE MATERIAL (Inlet / Outlet) MEDIUM	PATRATU STPS EXP. (3X800 MW) SH SPRAY BRANCH BLOCK VALVE OUTDOOR ON-OFF D114.3 x 17.12 / D114.3 x 17.12 SA106 Gr. C / SA106 Gr.C FEED WATER	
	MODEL NO. TYPE OF BODY: GUIDING:NO. OF PORTS BODY SIZE:PORT SIZE:DESIGN CV END CONNECTION & RATING (ANSI) BODY MATERIAL PACKING MATERIAL BONNET TYPE TRIM FORM TRIM MATERIAL: SEAT: PLUG: CAGE: STEM: BALANCED / UNBALANCED FLOW VALVE OUTLET VELOCITY REQUIRED LEAKAGE CLASS NOISE LEVEL (dBA) ANTI CAVITATION TRIM VALVE LIFT mm	GLOBE / TOP / CAGE / ONE BUTT WELDED; style-P; d1=84.4mm A216 WCB / WCC GRAFOIL EXTENDED / FINNED QUICK OPEN (ON / OFF) BELOW SEAT / ABOVE SEAT < 8 m/s V LESS THAN 85 dBA at 1 m	
PNEUMATIC ACTUATOR	MODEL NO. & SIZE CLOSE AT: OPEN AT (Kg/cm ² (g)) TRAVEL TIME FOR OPEN TO CLOSE, CLOSE TO OPEN VALVE POSN. ON SIGNAL AIR FAILURE VALVE POSN. ON SUPPLY AIR FAILURE	<10 Secs / <10 Secs NOT APPLICABLE STAY PUT	
PERFORMANCE OF VALVE	LINEARITY HYSTERESIS SENSITIVITY ACCURACY (OVERALL)	± 2% ± 5% ± 0.5% ± 2%	

SERVICE CONDITIONS

Sl. NO.	LOAD	FLOW T /h	INLET PR. kg/cm ² (g)	OUTLET PR. kg/cm ² (g)	PR. DROP kg/cm ² (g)	INLET TEMP(°C)	SP. GRAVITY	CALC. CV	VALVE LIFT %	VALVE OUTLET VELOCITY	NOISE LEVEL Dba
1	Design condition	97.9	332.5	331.49	1.01	296					
2	100% BMCR	33.8	336.1	335.98	0.12	296					
3	100% TMC	30.7	324.3	324.20	0.10	292					
4	75% TMC	24.4	248.5	248.44	0.06	275					
5	60% TMC	27.5	224.6	224.55	0.05	296					
6	50% TMC	17.4	163.2	163.17	0.03	251					
7	40% TMC	15.5	142.3	142.28	0.02	240					
8	HPH out condition	29.2	311.0	310.92	0.08	198					
9	Min flow condition	7.5	163.3	163.29	0.01	251					

ACTUATOR SIZING PRESSURE

: 357.5 kg/cm²(g)

BODY DESIGN: PRESSURE / TEMPERATURE

: 357.5 kg/cm²(g) / 296 °C

IBR FORM-III C

: REQUIRED

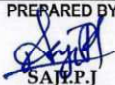
TOTAL WEIGHT (VALVE+ACTUATOR+ACCESSORIES)

: kg

Valves should be directly weldable to connecting pipe without the use of Reducers. Only Globe / Inline Valves acceptable. Angle Valves not acceptable.

* TAG NO'S - LAE71AA201, LAE71AA202

- LAE72AA201, LAE72AA202

	DATA SHEET FOR CONTROL VALVES (WITH PNEUMATIC ACTUATOR)		SPECIFICATION NO.: PATRATU	
			VOLUME	
			SECTION: Boiler mountings/PE (FB)	
			Rev. No. 00	DATE: 02.08.19
SHEET 2 OF 2				
Customer Nos.: 1828,1829,1830		Tag Nos.: *	Qty.: 4 Nos. / BOILER	
SH DESH #1 BRANCH BLOCK VALVE DATA SHEET – A&B				
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	NOT REQUIRED REQUIRED REQUIRED REQUIRED NOT REQUIRED REQUIRED NOT REQUIRED REQUIRED REQUIRED REQUIRED REQUIRED / NOT REQUIRED		
POSITIONER	MANUFACTURER & MODEL NO. BYPASS: GAUGES: ENCLOSURE CLASS INPUT SIGNAL IN kg/cm ² (g) OUTPUT SIGNAL	YES / NO / TWO : IP-65 4 - 20mA, 24 V DC TO SUIT ACTUATOR	NOT APPLICABLE	
AIR FILTER REGULATOR	MANUFACTURER & MODEL NO. AIR SUPPLY PRESSURE IN kg/cm ² (g) OUTPUT PRESSURE IN kg/cm ² (g) OUTPUT GAUGE	3.0 TO 5.0 TO SUIT ACTUATOR REQUIRED		
AIR LOCK	MANUFACTURER & MODEL NO. SET PRESSURE IN kg/cm ² (g) SUPPLY PRESSURE IN kg/cm ² (g) RESET TYPE VENT PLUG	3.0 TO 5.0 AUTO		
LIMIT SWITCH	MANUFACTURER & MODEL NO. OPEN: INT: CLOSE CONTACT TYPE RATING (AC/DC) ENCLOSURE CLASS	1 NO.FOR OPEN & 1 NO. FOR CLOSE DPDT(2NO + 2NC CONTACTS) 3A 240V AC AND 0.1A 220V DC IP65		
POSITION TRANSMITTER	MANUFACTURER & MODEL NO. TYPE SUPPLY OUTPUT RATING ACCURACY ENCLOSURE CLASS	INBUILT IN SMART POSITIONER	NOT APPLICABLE	
SOLENOID VALVE	MANUFACTURER & MODEL NO. RATING OPERATION / 4 WAY, DUAL COIL COIL INSULATION CLASS ENCLOSURE CLASS	24V, DC STAYPUT / 4WAY,DUAL COIL CLASS-H IP65 / NEMA4		
HANDWHEEL	ORIENTATION	SIDE MOUNTED		
JUNCTION BOX	TYPE / NO. OF WAYS / SIZE CABLE GLANDS: (SIZE / QTY) METHOD OF TERMINATION ENCLOSURE CLASS	CAGE CLAMP / THIRTY SIX / 2.5 SQ.MM REQUIRED : 16MM / 3 NO. / BRASS WITH NICKEL PLATED / BOTTOM 3 NO 9 PIN PLUG & SOCKET(2 WIRED, 1 LOOSE) IP65		
I/P CONVERTER (FAIL FREEZE TYPE)	INPUT SIGNAL : POWER SUPPLY SPLIT RANGE ENCLOSURE CLASS	INBUILT IN SMART POSITIONER	NOT APPLICABLE	
AIR CONNECTION SIZE SHOULD BE 1/4NPT(F)				
SIGN: NAME: DATE:	PREPARED BY  S.A.J.P.J. 02.08.19	CHECKED BY  A.JAICANESH 02.08.19	APPROVED BY  V.GUNASEKARAN 02.08.19	VENDOR SEAL SIGN: NAME: DATE:

* TAG NO'S - LAE71AA201, LAE71AA202
 - LAE72AA201, LAE72AA202



DATA SHEET FOR CONTROL VALVES (WITH PNEUMATIC ACTUATOR)

SPECIFICATION NO.: PATRATU

VOLUME

SECTION: Boiler mountings/PE (FB)

REV. NO. 00 DATE : 02.08.19

SHEET 1 OF 2

Customer Nos. : 1828,1829,1830

Tag Nos.: *

Qty.: 4 Nos. / BOILER

SH DESH #1 CONTROL VALVE DATA SHEET – A&B

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
SERVICE
LOCATION
DUTY
PIPE SIZE (Inlet / Outlet)
PIPE MATERIAL (Inlet / Outlet)
MEDIUMPATRATU STPS EXP. (3X800 MW)
SH SPRAY CONTROL VALVE
OUTDOOR
MODULATING
D114.3 x 17.12 / D114.3 x 17.12
SA335 P22 / SA335 P22
FEED WATER

BODY

MODEL NO.
TYPE OF BODY: GUIDING:NO. OF PORTS
BODY SIZE:PORT SIZE:DESIGN CV
END CONNECTION & RATING (ANSI)
BODY MATERIAL
PACKING MATERIAL
BONNET TYPE
TRIM FORM
TRIM MATERIAL:
SEAT:
PLUG:
CAGE:
STEM:
BALANCED / UNBALANCED
FLOW
VALVE OUTLET VELOCITY
REQUIRED LEAKAGE CLASS
NOISE LEVEL (dBA)
ANTI CAVITATION TRIM
VALVE LIFT mmGLOBE / CAGE / ONE

BUTT WELDED; style-P; d1=84.4mm
A217 WC9
GRAFOIL
EXTENDED / FINNEDBELOW SEAT / ABOVE SEAT
< 8 m/s
V
LESS THAN 85 dBA at 1 metre
YES

PNEUMATIC ACTUATOR

MODEL NO. & SIZE
CLOSE AT: OPEN AT (Kg/cm²(g))
TRAVEL TIME FOR
OPEN TO CLOSE, CLOSE TO OPEN
VALVE POSN. ON SIGNAL FAILURE (4-20 mA)
VALVE POSN. ON SUPPLY AIR FAILURESPRING ACTION CLOSES THE VALVE

<10 Secs / <10 Secs
STAY PUT
STAY PUT

PERFORMANCE OF VALVE

LINEARITY
HYSTERESIS
SENSITIVITY
ACCURACY (OVERALL)± 2%
± 1%
± 0.5%
± 2%

SERVICE CONDITIONS

Sl. NO.	LOAD	FLOW T /h	INLET PR. kg/cm ² (g)	OUTLET PR. kg/cm ² (g)	PR. DROP kg/cm ² (g)	INLET TEMP(°C)	SP. GRAVITY	CALC. CV	VALVE LIFT %	VALVE OUTLET VELOCITY	NOISE LEVEL Dba
1	Design condition	97.9	331.5	309.8	21.8	296					
2	100% BMCR	33.8	336.0	300.3	35.7	296					
3	100% TMCR	30.7	324.2	295.8	28.4	292					
4	75% TMCR	24.4	248.5	231.7	16.8	275					
5	60% TMCR	27.5	224.5	209.3	15.2	269					
6	50% TMCR	17.4	163.2	152.7	10.5	251					
7	40% TMCR	15.5	142.2	133.1	9.1	240					
8	HPH out condition	29.2	310.8	292.5	18.3	198					
9	Min flow condition	7.5	163.3	147.2	16.1	251					

ACTUATOR SIZING PRESSURE

: 357.5 kg/cm²(g)

BODY DESIGN: PRESSURE / TEMPERATURE

: 357.5 kg/cm²(g) / 296 °C

IBR FORM-III C

: REQUIRED

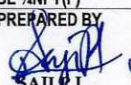
TOTAL WEIGHT (VALVE+ACTUATOR+ACCESSORIES)

: kg

Valves should be directly weldable to connecting pipe without the use of Reducers. Only Globe / Inline Valves acceptable. Angle Valves not acceptable.

* TAG NO'S - LAE71AA101, LAE71AA102

- LAE72AA101, LAE72AA102

	DATA SHEET FOR CONTROL VALVES (WITH PNEUMATIC ACTUATOR)		SPECIFICATION NO.: PATRATU	
			VOLUME	
			SECTION: Boiler mountings/PE (FB)	
			Rev. No. 00	DATE: 02.08.19
SHEET 2 OF 2				
Customer Nos.: 1828,1829,1830		Tag Nos.: *	Qty.: 4 Nos. / BOILER	
SH DESH #1 CONTROL VALVE DATA SHEET – A&B				
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	REQUIRED		
	AIR FILTER REGULATOR	REQUIRED		
	AIR LOCK RELAY	REQUIRED		
	POSITION LIMIT SWITCH	REQUIRED		
	POSITION TRANSMITTER	INBUILT IN SMART POSITIONER		
	SOLENOID VALVE	NOT REQUIRED		
	I/P CONVERTER	INBUILT IN SMART POSITIONER		
	JUNCTION BOX	REQUIRED		
	HAND WHEEL (SIDE MOUNTED)	REQUIRED		
	LOCAL POSITION INDICATOR	REQUIRED		
VOLUME BOOSTER & DUMP VALVE	REQUIRED / NOT REQUIRED			
SMART POSITIONER	MANUFACTURER & MODEL NO. BYPASS: GAUGES: ENCLOSURE CLASS INPUT SIGNAL IN kg/cm ² (g) OUTPUT SIGNAL	YES / NO / TWO : IP-65 4 - 20mA, 24 V DC TO SUIT ACTUATOR		SPECIFICATION ATTACHED
AIR FILTER REGULATOR	MANUFACTURER & MODEL NO. AIR SUPPLY PRESSURE IN kg/cm ² (g) OUTPUT PRESSURE IN kg/cm ² (g) OUTPUT GAUGE	3.0 TO 5.0 TO SUIT ACTUATOR REQUIRED		
AIR LOCK	MANUFACTURER & MODEL NO. SET PRESSURE IN kg/cm ² (g) SUPPLY PRESSURE IN kg/cm ² (g) RESET TYPE VENT PLUG	3.0 TO 5.0 AUTO		
LIMIT SWITCH	MANUFACTURER & MODEL NO. OPEN: INT: CLOSE CONTACT TYPE RATING (AC/DC) ENCLOSURE CLASS	1 NO. FOR OPEN & 1 NO. FOR CLOSE DPDT(2NO + 2NC CONTACTS) 3A 240V AC AND 0.1A 220V DC IP65		
POSITION TRANSMITTER	MANUFACTURER & MODEL NO. TYPE SUPPLY OUTPUT RATING ACCURACY ENCLOSURE CLASS	INBUILT IN SMART POSITIONER		INBUILT IN SMART POSITIONER
SOLENOID VALVE	MANUFACTURER & MODEL NO. RATING OPERATION / 4 WAY, DUAL COIL COIL INSULATION CLASS ENCLOSURE CLASS	24V, DC STAYPUT / 4WAY,DUAL COIL CLASS-H IP65 / NEMA4		NOT APPLICABLE
HANDWHEEL	ORIENTATION	SIDE MOUNTED		
JUNCTION BOX	TYPE / NO. OF WAYS / SIZE CABLE GLANDS: (SIZE / QTY) METHOD OF TERMINATION ENCLOSURE CLASS	CAGE CLAMP / THIRTY SIX / 2.5 SQ.MM REQUIRED : 16MM / 3 NO. / BRASS WITH NICKEL PLATED / BOTTOM 3 NO 9 PIN PLUG & SOCKET(2 WIRED, 1 LOOSE) IP65		
I/P CONVERTER (FAIL FREEZE TYPE)	INPUT SIGNAL : POWER SUPPLY SPLIT RANGE ENCLOSURE CLASS	INBUILT IN SMART POSITIONER		INBUILT IN SMART POSITIONER
AIR CONNECTION SIZE SHOULD BE 1/2NPT(F)				
SIGN: NAME: DATE:	PREPARED BY  S. J. J. 02.08.19	CHECKED BY  A. JAIGANESH 02.08.19	APPROVED BY  K. GUNASEKARAN 02.08.19	VENDOR SEAL
	TAG NO'S - LAE71AA101, LAE71AA102 - LAE72AA101, LAE72AA102			



DATA SHEET FOR CONTROL VALVES (WITH PNEUMATIC ACTUATOR)

SPECIFICATION NO.: PATRATU

VOLUME

SECTION: Boiler mountings/PE (FB)

Rev. No. 00 DATE: 02.08.19

SHEET 1 OF 2

Customer Nos.: 1828,1829,1830

Tag Nos.: LAE90AA201

Qty.: 1 No. / BOILER

SH DESH #2 COMMON LINE BLOCK VALVE DATA SHEET – A&B

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	PATRATU STPS EXP. (3X800 MW)	
	SERVICE	SH SPRAY COMMON BLOCK VALVE	
	LOCATION	OUTDOOR	
	DUTY	ON-OFF	
	PIPE SIZE (Inlet / Outlet) in mm	D114.3 x 17.12 / D114.3 x 17.12	
	PIPE MATERIAL (Inlet / Outlet)	SA106 GRc./SA106 Gr.C	
	MEDIUM	FEED WATER	
	MODEL NO.		
BODY	TYPE OF BODY: GUIDING:NO. OF PORTS	GLOBE / TOP / CAGE / ONE	
	BODY SIZE:PORT SIZE:DESIGN CV		
	END CONNECTION & RATING (ANSI)	BUTT WELDED; style-P; d1=84.4mm	
	BODY MATERIAL	A216 WCB / WCC	
	PACKING MATERIAL	GRAFOIL	
	BONNET TYPE	EXTENDED / FINNED	
	TRIM FORM	QUICK OPEN (ON / OFF)	
	TRIM MATERIAL:		
	SEAT:		
	PLUG:		
	CAGE:		
	STEM:		
	BALANCED / UNBALANCED		
	FLOW	BELOW SEAT / ABOVE SEAT	
	VALVE OUTLET VELOCITY	< 8 m/s	
	REQUIRED LEAKAGE CLASS	V	
	NOISE LEVEL (dBA)	LESS THAN 85 dBA at 1 m	
	ANTI CAVITATION TRIM		
	VALVE LIFT mm		
PNEUMATIC ACTUATOR	MODEL NO. & SIZE		
	CLOSE AT: OPEN AT (Kg/cm ² (g))		
	TRAVEL TIME FOR		
	OPEN TO CLOSE, CLOSE TO OPEN	<10 Secs / <10 Secs	
	VALVE POSN. ON SIGNAL AIR FAILURE	NOT APPLICABLE	
	VALVE POSN. ON SUPPLY AIR FAILURE	STAY PUT	
PERFORMANCE OF VALVE	LINEARITY	± 2%	
	HYSTERESIS	± 5%	
	SENSITIVITY	± 0.5%	
	ACCURACY (OVERALL)	± 2%	

SERVICE CONDITIONS

SI. NO.	LOAD	FLOW T /h	INLET PR. kg/cm ² (g)	OUTLET PR. kg/cm ² (g)	PR. DROP kg/cm ² (g)	INLET TEMP(°C)	SP. GRAVITY	CALC. CV	VALVE LIFT %	VALVE OUTLET VELOCITY	NOISE LEVEL Dba
1	Design condition	111.4	331.2	329.90	1.30	296					
2	100% BMCR	34.8	336.1	335.97	0.13	296					
3	100% TMCR	30.8	324.3	324.20	0.10	292					
4	75% TMCR	19.2	248.6	248.56	0.04	275					
5	60% TMCR	16.4	224.7	224.67	0.03	269					
6	50% TMCR	10.2	163.3	163.29	0.01	251					
7	40% TMCR	9.5	142.3	142.29	0.01	240					
8	HPH out condition	24.0	311.0	310.95	0.05	198					
9	Min flow condition	7.6	163.3	163.29	0.01	251					

ACTUATOR SIZING PRESSURE

: 357.5 kg/cm²(g)

BODY DESIGN: PRESSURE / TEMPERATURE

: 357.5 kg/cm²(g) / 296 °C

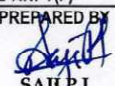
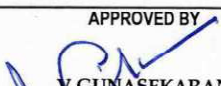
IBR FORM-III C

: REQUIRED

TOTAL WEIGHT (VALVE+ACTUATOR+ACCESSORIES)

: kg

Valves should be directly weldable to connecting pipe without the use of Reducers. Only Globe / Inline Valves acceptable. Angle Valves not acceptable.

	DATA SHEET FOR CONTROL VALVES (WITH PNEUMATIC ACTUATOR)		SPECIFICATION NO.: PATRATU	
			VOLUME	
			SECTION: Boiler mountings/PE (FB)	
			Rev. No. 00	DATE: 02.08.19
SHEET 2 OF 2				
Customer Nos.: 1828,1829,1830		Tag Nos.: LAE90AA201		Qty.: 1 No. / BOILER
SH DESH #2 COMMON LINE BLOCK VALVE DATA SHEET – A&B				
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	NOT REQUIRED		
	AIR FILTER REGULATOR	REQUIRED		
	AIR LOCK RELAY	REQUIRED		
	POSITION LIMIT SWITCH	REQUIRED		
	POSITION TRANSMITTER	NOT REQUIRED		
	SOLENOID VALVE	REQUIRED		
	I/P CONVERTER	NOT REQUIRED		
	JUNCTION BOX	REQUIRED		
	HAND WHEEL (SIDE MOUNTED)	REQUIRED		
	LOCAL POSITION INDICATOR	REQUIRED		
VOLUME BOOSTER & DUMP VALVE	REQUIRED / NOT REQUIRED			
POSITIONER	MANUFACTURER & MODEL NO. BYPASS: GAUGES: ENCLOSURE CLASS INPUT SIGNAL IN kg/cm ² (g) OUTPUT SIGNAL	YES / NO / TWO : IP-65 4 - 20mA, 24 V DC TO SUIT ACTUATOR	NOT APPLICABLE	
AIR FILTER REGULATOR	MANUFACTURER & MODEL NO. AIR SUPPLY PRESSURE IN kg/cm ² (g) OUTPUT PRESSURE IN kg/cm ² (g) OUTPUT GAUGE	3.0 TO 5.0 TO SUIT ACTUATOR REQUIRED		
AIR LOCK	MANUFACTURER & MODEL NO. SET PRESSURE IN kg/cm ² (g) SUPPLY PRESSURE IN kg/cm ² (g) RESET TYPE VENT PLUG	3.0 TO 5.0 AUTO		
LIMIT SWITCH	MANUFACTURER & MODEL NO. OPEN: INT: CLOSE CONTACT TYPE RATING (AC/DC) ENCLOSURE CLASS	1 NO.FOR OPEN & 1 NO. FOR CLOSE DPDT(2NO + 2NC CONTACTS) 3A 240V AC AND 0.1A 220V DC IP65		
POSITION TRANSMITTER	MANUFACTURER & MODEL NO. TYPE SUPPLY OUTPUT RATING ACCURACY ENCLOSURE CLASS	INBUILT IN SMART POSITIONER	NOT APPLICABLE	
SOLENOID VALVE	MANUFACTURER & MODEL NO. RATING OPERATION / 4 WAY, DUAL COIL COIL INSULATION CLASS ENCLOSURE CLASS	24V, DC STAYPUT / 4WAY,DUAL COIL CLASS-H IP65 / NEMA4		
HANDWHEEL	ORIENTATION	SIDE MOUNTED		
JUNCTION BOX	TYPE / NO. OF WAYS / SIZE CABLE GLANDS: (SIZE / QTY) METHOD OF TERMINATION ENCLOSURE CLASS	CAGE CLAMP / THIRTY SIX / 2.5 SQ.MM REQUIRED : 16MM / 3 NO. / BRASS WITH NICKEL PLATED / BOTTOM 3 NO 9 PIN PLUG & SOCKET(2 WIRED, 1 LOOSE) IP65		
I/P CONVERTER (FAIL FREEZE TYPE)	INPUT SIGNAL : POWER SUPPLY SPLIT RANGE ENCLOSURE CLASS	INBUILT IN SMART POSISTIONER	NOT APPLICABLE	
AIR CONNECTION SIZE SHOULD BE 1/2NPT(F)				
SIGN: NAME: DATE:	PREPARED BY  S.A.J.P.J. 02.08.19	CHECKED BY  A.JAIGANESH 02.08.19	APPROVED BY  V.GUNASEKARAN 02.08.19	VENDOR SEAL SIGN: NAME: DATE:

	DATA SHEET FOR CONTROL VALVES (WITH PNEUMATIC ACTUATOR)					SPECIFICATION NO.: PATRATU					
						VOLUME					
						SECTION: Boiler mountings/PE (FB)					
						Rev. No. 00		DATE: 02.08.19			
SHEET 1 OF 2											
Customer Nos.: 1828,1829,1830			Tag Nos.: *			Qty.: 4 Nos. / BOILER					
SH DESH #2 BRANCH BLOCK VALVE DATA SHEET – A&B											
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					PATRATU STPS EXP. (3X800 MW)					
	SERVICE					SH SPRAY BRANCH BLOCK VALVE					
BODY	LOCATION					OUTDOOR					
	DUTY					ON-OFF					
	PIPE SIZE (Inlet / Outlet) in mm					D88.9 x 15.24 / D88.9 x 15.24					
	PIPE MATERIAL (Inlet / Outlet)					SA106 GrC/SA106 Gr.C					
	MEDIUM					FEED WATER					
	MODEL NO.					GLOBE / TOP / CAGE / ONE					
	TYPE OF BODY: GUIDING:NO. OF PORTS					BUTT WELDED; style-P; d1=62.3mm					
	BODY SIZE:PORT SIZE:DESIGN CV					A216 WCB / WCC					
	END CONNECTION & RATING (ANSI)					GRAFOIL					
	BODY MATERIAL					EXTENDED / FINNED					
PACKING MATERIAL					QUICK OPEN (ON / OFF)						
BONNET TYPE											
TRIM FORM											
TRIM MATERIAL:											
SEAT:											
PLUG:											
CAGE:											
STEM:											
BALANCED / UNBALANCED											
FLOW					BELOW SEAT / ABOVE SEAT						
VALVE OUTLET VELOCITY					< 8 m/s						
REQUIRED LEAKAGE CLASS					V						
NOISE LEVEL (dBA)					LESS THAN 85 dBA at 1 m						
ANTI CAVITATION TRIM											
VALVE LIFT mm											
PNEUMATIC ACTUATOR	MODEL NO. & SIZE										
	CLOSE AT: OPEN AT (Kg/cm ² (g))										
	TRAVEL TIME FOR										
	OPEN TO CLOSE, CLOSE TO OPEN					<10 Secs / <10 Secs					
VALVE POSN. ON SIGNAL AIR FAILURE					NOT APPLICABLE						
VALVE POSN. ON SUPPLY AIR FAILURE					STAY PUT						
PERFORMANCE OF VALVE	LINEARITY					± 2%					
	HYSTERESIS					± 5%					
	SENSITIVITY					± 0.5%					
	ACCURACY (OVERALL)					± 2%					
SERVICE CONDITIONS											
Sl. NO.	LOAD	FLOW T /h	INLET PR. kg/cm ² (g)	OUTLET PR. kg/cm ² (g)	PR. DROP kg/cm ² (g)	INLET TEMP(°C)	SP. GRAVITY	CALC. CV	VALVE LIFT %	VALVE OUTLET VELOCITY	NOISE LEVEL Dba
1	Design condition	55.7	328.7	327.84	0.86	296					
2	100% BMCR	17.4	335.8	335.72	0.08	296					
3	100% TMCR	15.4	324.1	324.03	0.07	292					
4	75% TMCR	9.6	248.6	248.58	0.02	275					
5	60% TMCR	8.2	224.6	224.58	0.02	269					
6	50% TMCR	5.1	163.3	163.290	0.010	251					
7	40% TMCR	4.8	142.3	142.29	0.01	240					
8	HPH out condition	12.0	310.9	310.87	0.03	198					
9	Min flow condition	3.8	163.3	163.29	0.01	251					

ACTUATOR SIZING PRESSURE

: 357.5 kg/cm²(g)

BODY DESIGN: PRESSURE / TEMPERATURE

: 357.5 kg/cm²(g) / 296 °C

IBR FORM-III C

: REQUIRED

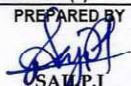
TOTAL WEIGHT (VALVE+ACTUATOR+ACCESSORIES)

: kg

Valves should be directly weldable to connecting pipe without the use of Reducers. Only Globe / Inline Valves acceptable. Angle Valves not acceptable.

* TAG NO'S - LAE91AA201, LAE91AA202

- LAE92AA201, LAE92AA202

	DATA SHEET FOR CONTROL VALVES (WITH PNEUMATIC ACTUATOR)		SPECIFICATION NO.: PATRATU	
			VOLUME	
			SECTION: Boiler mountings/PE (FB)	
			Rev. No. 00	DATE: 02.08.19
SHEET 2 OF 2				
Customer Nos.: 1828,1829,1830		Tag Nos.: *		Qty.: 4 Nos. / BOILER
SH DESH #2 BRANCH BLOCK VALVE DATA SHEET – A&B				
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	NOT REQUIRED REQUIRED REQUIRED REQUIRED NOT REQUIRED REQUIRED NOT REQUIRED REQUIRED REQUIRED REQUIRED REQUIRED / NOT REQUIRED		
POSITIONER	MANUFACTURER & MODEL NO. BYPASS: GAUGES: ENCLOSURE CLASS INPUT SIGNAL IN kg/cm ² (g) OUTPUT SIGNAL	YES / NO / TWO : IP-65 4 - 20mA, 24 V DC TO SUIT ACTUATOR	NOT APPLICABLE	
AIR FILTER REGULATOR	MANUFACTURER & MODEL NO. AIR SUPPLY PRESSURE IN kg/cm ² (g) OUTPUT PRESSURE IN kg/cm ² (g) OUTPUT GAUGE	3.0 TO 5.0 TO SUIT ACTUATOR REQUIRED		
AIR LOCK	MANUFACTURER & MODEL NO. SET PRESSURE IN kg/cm ² (g) SUPPLY PRESSURE IN kg/cm ² (g) RESET TYPE VENT PLUG	3.0 TO 5.0 AUTO		
LIMIT SWITCH	MANUFACTURER & MODEL NO. OPEN: INT: CLOSE CONTACT TYPE RATING (AC/DC) ENCLOSURE CLASS	1 NO. FOR OPEN & 1 NO. FOR CLOSE DPDT(2NO + 2NC CONTACTS) 3A 240V AC AND 0.1A 220V DC IP65		
POSITION TRANSMITTER	MANUFACTURER & MODEL NO. TYPE SUPPLY OUTPUT RATING ACCURACY ENCLOSURE CLASS	INBUILT IN SMART POSITIONER	NOT APPLICABLE	
SOLENOID VALVE	MANUFACTURER & MODEL NO. RATING OPERATION / 4 WAY, DUAL COIL COIL INSULATION CLASS ENCLOSURE CLASS	24V, DC STAYPUT / 4WAY.DUAL COIL CLASS-H IP65 / NEMA4		
HANDWHEEL	ORIENTATION	SIDE MOUNTED		
JUNCTION BOX	TYPE / NO. OF WAYS / SIZE CABLE GLANDS: (SIZE / QTY) METHOD OF TERMINATION ENCLOSURE CLASS	CAGE CLAMP / THIRTY SIX / 2.5 SQ.MM REQUIRED : 16MM / 3 NO. / BRASS WITH NICKEL PLATED / BOTTOM 3 NO 9 PIN PLUG & SOCKET(2 WIRED, 1 LOOSE) IP65		
I/P CONVERTER (FAIL FREEZE TYPE)	INPUT SIGNAL : POWER SUPPLY SPLIT RANGE ENCLOSURE CLASS	INBUILT IN SMART POSITIONER	NOT APPLICABLE	
AIR CONNECTION SIZE SHOULD BE 1/2NPT(F)				
SIGN: NAME: DATE:	PREPARED BY  S. J. P. J. 02.08.19	CHECKED BY  A. JAIGANESH 02.08.19	APPROVED BY  V. GUNASEKARAN 02.08.19	VENDOR SEAL SIGN: NAME: DATE:

* TAG NO'S - LAE91AA201, LAE91AA202
 - LAE92AA201, LAE92AA202



DATA SHEET FOR CONTROL VALVES (WITH PNEUMATIC ACTUATOR)

SPECIFICATION NO.: PATRATU

VOLUME

SECTION: Boiler mountings/PE (FB)

REV. NO. 00

DATE : 02.08.19

SHEET 1 OF 2

Customer Nos. : 1828,1829,1830

Tag Nos.: *

Qty.: 4 Nos. / BOILER

SH DESH #2 CONTROL VALVE DATA SHEET – A&B

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 SERVICE LOCATION DUTY PIPE SIZE (Inlet / Outlet) in mm PIPE MATERIAL (Inlet / Outlet) MEDIUM	PATRATU STPS EXP. (3X800 MW) SH SPRAY CONTROL VALVE OUTDOOR MODULATING D88.9 x 15.24 / D88.9 x 15.24 SA335 P22 / SA335 P22 FEED WATER
	MODEL NO. TYPE OF BODY: GUIDING: NO. OF PORTS BODY SIZE: PORT SIZE: DESIGN CV END CONNECTION & RATING (ANSI) BODY MATERIAL PACKING MATERIAL BONNET TYPE TRIM FORM TRIM MATERIAL: SEAT: PLUG: CAGE: STEM: BALANCED / UNBALANCED FLOW VALVE OUTLET VELOCITY REQUIRED LEAKAGE CLASS NOISE LEVEL (dBA) ANTI CAVITATION TRIM VALVE LIFT mm	GLOBE / CAGE / ONE BUTT WELDED; style-P; d1=62.3mm A217 WC9 GRAFOIL EXTENDED / FINNED BELOW SEAT / ABOVE SEAT < 8 m/s V LESS THAN 85 dBA at 1 metre YES
PNEUMATIC ACTUATOR	MODEL NO. & SIZE CLOSE AT: OPEN AT (Kg/cm ² (g)) TRAVEL TIME FOR OPEN TO CLOSE, CLOSE TO OPEN VALVE POSN. ON SIGNAL FAILURE (4-20 mA) VALVE POSN. ON SUPPLY AIR FAILURE	SPRING ACTION CLOSES THE VALVE <10 Secs / <10 Secs STAY PUT STAY PUT
PERFORMANCE OF VALVE	LINEARITY HYSTERESIS SENSITIVITY ACCURACY (OVERALL)	± 2% ± 1% ± 0.5% ± 2%

SERVICE CONDITIONS

Sl. NO.	LOAD	FLOW T /m	INLET PR. kg/cm ² (g)	OUTLET PR. kg/cm ² (g)	PR. DROP kg/cm ² (g)	INLET TEMP(°C)	SP. GRAVITY	CALC. CV	VALVE LIFT %	VALVE OUTLET VELOCITY	NOISE LEVEL Dba
1	Design condition	55.7	327.9	315.7	12.1	296					
2	100% BMCR	17.4	335.8	294.4	41.6	296					
3	100% TMCR	15.4	324.0	290.6	33.4	292					
4	75% TMCR	9.6	248.5	227.3	21.2	275					
5	60% TMCR	8.2	224.6	205.2	19.4	269					
6	50% TMCR	5.1	163.3	149.4	13.9	251					
7	40% TMCR	4.8	142.3	130.3	11.9	240					
8	HPH out condition	12.0	310.8	287.7	23.1	198					
9	Min flow condition	3.8	163.3	146.5	16.8	251					

ACTUATOR SIZING PRESSURE

: 357.5 kg/cm²(g)

BODY DESIGN: PRESSURE / TEMPERATURE

: 357.5 kg/cm²(g) / 296°C

IBR FORM-III C

: REQUIRED

TOTAL WEIGHT (VALVE+ACTUATOR+ACCESSORIES)

: kg

Valves should be directly weldable to connecting pipe without the use of Reducers. Only Globe / Inline Valves acceptable. Angle Valves not acceptable.

* TAG NO'S - LAE91AA101, LAE91AA102

- LAE92AA101, LAE92AA102

	DATA SHEET FOR CONTROL VALVES (WITH PNEUMATIC ACTUATOR)		SPECIFICATION NO.: PATRATU	
			VOLUME	
			SECTION: Boiler mountings/PE (FB)	
			Rev. No. 00	DATE: 02.08.19
SHEET 2 OF 2				
Customer Nos.: 1828,1829,1830		Tag Nos.: *		Qty.: 4 Nos. / BOILER
SH DESH #2 CONTROL VALVE DATA SHEET – A&B				
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 IN kg/cm ² (g) OUTPUT SIGNAL	YES / NO / TWO : IP-65 4 - 20mA, 24 V DC TO SUIT ACTUATOR	SPECIFICATION ATTACHED	
AIR FILTER REGULATOR	MANUFACTURER & MODEL NO. AIR SUPPLY PRESSURE IN kg/cm ² (g) OUTPUT PRESSURE IN kg/cm ² (g) OUTPUT GAUGE	3.0 TO 5.0 TO SUIT ACTUATOR REQUIRED		
AIR LOCK	MANUFACTURER & MODEL NO. SET PRESSURE IN kg/cm ² (g) SUPPLY PRESSURE IN kg/cm ² (g) RESET TYPE VENT PLUG	3.0 TO 5.0 AUTO		
LIMIT SWITCH	MANUFACTURER & MODEL NO. OPEN: INT: CLOSE CONTACT TYPE RATING (AC/DC) ENCLOSURE CLASS	1 NO. FOR OPEN & 1 NO. FOR CLOSE DPDT(2NO + 2NC CONTACTS) 3A 240V AC AND 0.1A 220V DC IP65		
POSITION TRANSMITTER	MANUFACTURER & MODEL NO. TYPE SUPPLY OUTPUT RATING ACCURACY ENCLOSURE CLASS	INBUILT IN SMART POSITIONER	INBUILT IN SMART POSITIONER	
SOLENOID VALVE	MANUFACTURER & MODEL NO. RATING OPERATION / 4 WAY, DUAL COIL COIL INSULATION CLASS ENCLOSURE CLASS	24V, DC STAYPUT / 4WAY, DUAL COIL CLASS-H IP65 / NEMA4	NOT APPLICABLE	
HANDWHEEL	ORIENTATION	SIDE MOUNTED		
JUNCTION BOX	TYPE / NO. OF WAYS / SIZE CABLE GLANDS: (SIZE / QTY) METHOD OF TERMINATION ENCLOSURE CLASS	CAGE CLAMP / THIRTY SIX / 2.5 SQ.MM REQUIRED : 16MM / 3 NO. / BRASS WITH NICKEL PLATED / BOTTOM 3 NO 9 PIN PLUG & SOCKET(2 WIRED, 1 LOOSE) IP65		
I/P CONVERTER (FAIL FREEZE TYPE)	INPUT SIGNAL : POWER SUPPLY SPLIT RANGE ENCLOSURE CLASS	INBUILT IN SMART POSITIONER	INBUILT IN SMART POSITIONER	
AIR CONNECTION SIZE SHOULD BE 1/2NPT(F)				
SIGN: NAME: DATE:	PREPARED BY  S. JAGANESH 02.08.19	CHECKED BY  V. GUNASEKARAN 02.08.19	APPROVED BY  V. GUNASEKARAN 02.08.19	VENDOR SEAL SIGN: NAME: DATE:

TAG NO'S - LAE91AA101, LAE91AA102
 - LAE92AA101, LAE92AA102



DATA SHEET FOR CONTROL VALVES (WITH PNEUMATIC ACTUATOR)

SPECIFICATION NO.: PATRATU

VOLUME

SECTION: Boiler mountings/PE (FB)

Rev. No. 00

DATE : 02.08.19

SHEET 1 OF 2

Customer Nos. : 1828,1829,1830

Tag Nos.: LAE20AA201

Qty.: 1 NO./BOILER

RH DESH COMMON LINE BLOCK VALVE DATA SHEET – A&B

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 SERVICE LOCATION DUTY PIPE SIZE (Inlet / Outlet) in mm PIPE MATERIAL (Inlet / Outlet) MEDIUM	PATRATU STPS EXP. (3X800 MW) RH SPRAY COMMON BLOCK VALVE OUTDOOR ON-OFF D114.3 x 13.49 / D114.3 x 13.49 SA106 GR.C/SA106 GR.C FEED WATER	
	MODEL NO. TYPE OF BODY: GUIDING:NO. OF PORTS BODY SIZE:PORT SIZE:DESIGN CV END CONNECTION & RATING (ANSI) BODY MATERIAL PACKING MATERIAL BONNET TYPE TRIM FORM TRIM MATERIAL: SEAT: PLUG: CAGE: STEM: BALANCED / UNBALANCED FLOW VALVE OUTLET VELOCITY REQUIRED LEAKAGE CLASS NOISE LEVEL (dBA) ANTI CAVITATION TRIM VALVE LIFT mm	GLOBE / TOP / CAGE / ONE BUTT WELDED; style-D; d1=90.7mm A216 WCB / WCC GRAFOIL STD / EXTENDED / FINNED QUICK OPEN (ON / OFF) BELOW SEAT / ABOVE SEAT < 8 m/s V LESS THAN 85 dBA at 1 m	
PNEUMATIC ACTUATOR	MODEL NO. & SIZE CLOSE AT: OPEN AT (Kg/cm ² (g)) TRAVEL TIME FOR OPEN TO CLOSE, CLOSE TO OPEN VALVE POSN. ON SIGNAL AIR FAILURE VALVE POSN. ON SUPPLY AIR FAILURE	<10 Secs / <10 Secs NOT APPLICABLE STAY PUT	
PERFORMANCE OF VALVE	LINEARITY HYSTERESIS SENSITIVITY ACCURACY (OVERALL)	± 2% ± 5% ± 0.5% ± 2%	

SERVICE CONDITIONS

Sl. NO.	LOAD	FLOW T /h	INLET PR. kg/cm ² (g)	OUTLET PR. kg/cm ² (g)	PR. DROP kg/cm ² (g)	INLET TEMP(°C)	SP. GRAVITY	CALC. CV	VALVE LIFT %	VALVE OUTLET VELOCITY	NOISE LEVEL Dba
1	Design condition	165.4	151.2	145.15	6.05	188.9					
2	BMCR	39.0	151.2	150.86	0.34	188.9					

ACTUATOR SIZING PRESSURE

: 210 kg/cm²(g)

BODY DESIGN: PRESSURE / TEMPERATURE

: 210 kg/cm²(g) / 200°C

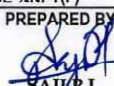
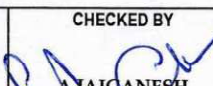
IBR FORM-III C

: REQUIRED

TOTAL WEIGHT (VALVE+ACTUATOR+ACCESSORIES)

: kg

Valves should be directly weldable to connecting pipe without the use of Reducers. Only Globe / Inline Valves acceptable. Angle Valves not acceptable.

	DATA SHEET FOR CONTROL VALVES (WITH PNEUMATIC ACTUATOR)		SPECIFICATION NO.: PATRATU	
			VOLUME	
			SECTION: Boiler mountings/PE (FB)	
			Rev. No. 00	DATE: 02.08.19
SHEET 2 OF 2				
Customer Nos.: 1828,1829,1830		Tag Nos.: LAE20AA201		Qty.: 1 NO./BOILER
RH DESH COMMON LINE BLOCK VALVE DATA SHEET – A&B				
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	NOT REQUIRED		
	AIR FILTER REGULATOR	REQUIRED		
	AIR LOCK RELAY	REQUIRED		
	POSITION LIMIT SWITCH	REQUIRED		
	POSITION TRANSMITTER	NOT REQUIRED		
	SOLENOID VALVE	REQUIRED		
	I/P CONVERTER	NOT REQUIRED		
	JUNCTION BOX	REQUIRED		
	HAND WHEEL (SIDE MOUNTED)	REQUIRED		
	LOCAL POSITION INDICATOR	REQUIRED		
VOLUME BOOSTER & DUMP VALVE	REQUIRED / NOT REQUIRED			
POSITIONER	MANUFACTURER & MODEL NO. BYPASS: GAUGES: ENCLOSURE CLASS INPUT SIGNAL IN kg/cm ² (g) OUTPUT SIGNAL	YES / NO / TWO : IP-65 4 - 20mA, 24 V DC TO SUIT ACTUATOR		NOT APPLICABLE
AIR FILTER REGULATOR	MANUFACTURER & MODEL NO. AIR SUPPLY PRESSURE IN kg/cm ² (g) OUTPUT PRESSURE IN kg/cm ² (g) OUTPUT GAUGE	3.0 TO 5.0 TO SUIT ACTUATOR REQUIRED		
AIR LOCK	MANUFACTURER & MODEL NO. SET PRESSURE IN kg/cm ² (g) SUPPLY PRESSURE IN kg/cm ² (g) RESET TYPE VENT PLUG	3.0 TO 5.0 AUTO		
LIMIT SWITCH	MANUFACTURER & MODEL NO. OPEN: INT: CLOSE CONTACT TYPE RATING (AC/DC) ENCLOSURE CLASS	1 NO.FOR OPEN & 1 NO. FOR CLOSE DPDT(2NO + 2NC CONTACTS) 3A 240V AC AND 0.1A 220V DC IP65		
POSITION TRANSMITTER	MANUFACTURER & MODEL NO. TYPE SUPPLY OUTPUT RATING ACCURACY ENCLOSURE CLASS	INBUILT IN SMART POSITIONER		NOT APPLICABLE
SOLENOID VALVE	MANUFACTURER & MODEL NO. RATING OPERATION / 4 WAY, DUAL COIL COIL INSULATION CLASS ENCLOSURE CLASS	24V, DC STAYPUT / 4WAY,DUAL COIL CLASS-H IP65 / NEMA4		
HANDWHEEL	ORIENTATION	SIDE MOUNTED		
JUNCTION BOX	TYPE / NO. OF WAYS / SIZE CABLE GLANDS: (SIZE / QTY) METHOD OF TERMINATION ENCLOSURE CLASS	CAGE CLAMP / THIRTY SIX / 2.5 SQ.MM REQUIRED : 16MM / 3 NO. / BRASS WITH NICKEL PLATED / BOTTOM 3 NO 9 PIN PLUG & SOCKET(2 WIRED, 1 LOOSE) IP65		
I/P CONVERTER (FAIL FREEZE TYPE)	INPUT SIGNAL : POWER SUPPLY SPLIT RANGE ENCLOSURE CLASS	INBUILT IN SMART POSITIONER		NOT APPLICABLE
AIR CONNECTION SIZE SHOULD BE 1/2NPT(F)				
SIGN: NAME: DATE:	PREPARED BY	CHECKED BY	APPROVED BY	VENDOR SEAL
	 SAJID P. J.	 A. JAIGANESH	 V. GUNASEKARAN	
	02.08.19	02.08.19	02.08.19	SIGN: NAME: DATE:

		DATA SHEET FOR CONTROL VALVES (WITH PNEUMATIC ACTUATOR)				SPECIFICATION NO.: PATRATU VOLUME SECTION: Boiler mountings/PE (FB) Rev. No. 00 DATE : 02.08.19 SHEET 1 OF 2					
Customer Nos. : 1828,1829,1830		Tag Nos. : *		Qty.: 4 Nos. / BOILER							
RH DESH BRANCH BLOCK VALVE DATA SHEET – A&B											
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			PATRATU STPS EXP. (3X800 MW)							
	SERVICE			RH SPRAY BRANCH BLOCK VALVE							
BODY	LOCATION			OUTDOOR							
	DUTY			ON OFF							
	PIPE SIZE (Inlet / Outlet) in mm			D88.9 x 11.13 / D88.9 x 11.13							
	PIPE MATERIAL (Inlet / Outlet)			SA106 GR.C/SA106 GR.C							
	MEDIUM			FEED WATER							
	MODEL NO.			GLOBE / TOP / CAGE / ONE							
	TYPE OF BODY: GUIDING:NO. OF PORTS										
	BODY SIZE:PORT SIZE:DESIGN CV										
	END CONNECTION & RATING (ANSI)			BUTT WELDED; style-D; d1=69.5mm							
	BODY MATERIAL			A216 WCB / WCC							
PACKING MATERIAL			GRAFOIL								
BONNET TYPE			STD / EXTENDED / FINNED								
TRIM FORM			QUICK OPEN (ON / OFF)								
TRIM MATERIAL:											
SEAT:											
PLUG:											
CAGE:											
STEM:											
BALANCED / UNBALANCED											
FLOW			BELOW SEAT / ABOVE SEAT								
VALVE OUTLET VELOCITY			< 8 m/s								
REQUIRED LEAKAGE CLASS			V								
NOISE LEVEL (dba)			LESS THAN 85 dba at 1 m								
ANTI CAVITATION TRIM											
VALVE LIFT mm											
PNEUMATIC ACTUATOR	MODEL NO. & SIZE										
	CLOSE AT: OPEN AT (Kg/cm ² (g))										
	TRAVEL TIME FOR										
	OPEN TO CLOSE, CLOSE TO OPEN			<10 Secs / <10 Secs							
VALVE POSN. ON SIGNAL AIR FAILURE			NOT APPLICABLE								
VALVE POSN. ON SUPPLY AIR FAILURE			STAY PUT								
PERFORMANCE OF VALVE	LINEARITY			± 2%							
	HYSTERESIS			± 5%							
	SENSITIVITY			± 0.5%							
	ACCURACY (OVERALL)			± 2%							
SERVICE CONDITIONS											
Sl. NO.	LOAD	FLOW T /h	INLET PR. kg/cm ² (g)	OUTLET PR. kg/cm ² (g)	PR. DROP kg/cm ² (g)	INLET TEMP(°C)	SP. GRAVITY	CALC. CV	VALVE LIFT %	VALVE OUTLET VELOCITY	NOISE LEVEL Dba
1	Design condition	82.70	144.1	141.63	2.47	188.9					
3	BMCR	17.50	150.8	150.66	0.14	188.9					

ACTUATOR SIZING PRESSURE

: 210 kg/cm²(g)

BODY DESIGN: PRESSURE / TEMPERATURE

: 210 kg/cm²(g) / 200°C

IBR FORM-III C

: REQUIRED

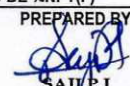
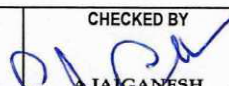
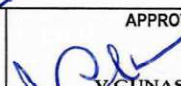
TOTAL WEIGHT (VALVE+ACTUATOR+ACCESSORIES)

: kg

Valves should be directly weldable to connecting pipe without the use of Reducers. Only Globe / Inline Valves acceptable. Angle Valves not acceptable.

* TAG NO'S - LAE21AA201, LAE21AA202

- LAE22AA201, LAE22AA202

	DATA SHEET FOR CONTROL VALVES (WITH PNEUMATIC ACTUATOR)		SPECIFICATION NO.: PATRATU	
			VOLUME	
			SECTION: Boiler mountings/PE (FB)	
			Rev. No. 00	DATE: 02.08.19
SHEET 2 OF 2				
Customer Nos.: 1828,1829,1830		Tag Nos.: *		Qty.: 4 Nos. / BOILER
RH DESH BRANCH BLOCK VALVE DATA SHEET – A&B				
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	NOT REQUIRED REQUIRED REQUIRED REQUIRED NOT REQUIRED REQUIRED NOT REQUIRED REQUIRED REQUIRED REQUIRED REQUIRED / NOT REQUIRED		
POSITIONER	MANUFACTURER & MODEL NO. BYPASS: GAUGES: ENCLOSURE CLASS INPUT SIGNAL IN kg/cm ² (g) OUTPUT SIGNAL	YES / NO / TWO : IP-65 4 - 20mA, 24 V DC TO SUIT ACTUATOR	NOT APPLICABLE	
AIR FILTER REGULATOR	MANUFACTURER & MODEL NO. AIR SUPPLY PRESSURE IN kg/cm ² (g) OUTPUT PRESSURE IN kg/cm ² (g) OUTPUT GAUGE	3.0 TO 5.0 TO SUIT ACTUATOR REQUIRED		
AIR LOCK	MANUFACTURER & MODEL NO. SET PRESSURE IN kg/cm ² (g) SUPPLY PRESSURE IN kg/cm ² (g) RESET TYPE VENT PLUG	3.0 TO 5.0 AUTO		
LIMIT SWITCH	MANUFACTURER & MODEL NO. OPEN: INT: CLOSE CONTACT TYPE RATING (AC/DC) ENCLOSURE CLASS	1 NO.FOR OPEN & 1 NO. FOR CLOSE DPDT(2NO + 2NC CONTACTS) 3A 240V AC AND 0.1A 220V DC IP65		
POSITION TRANSMITTER	MANUFACTURER & MODEL NO. TYPE SUPPLY OUTPUT RATING ACCURACY ENCLOSURE CLASS	INBUILT IN SMART POSITIONER	NOT APPLICABLE	
SOLENOID VALVE	MANUFACTURER & MODEL NO. RATING OPERATION / 4 WAY, DUAL COIL COIL INSULATION CLASS ENCLOSURE CLASS	24V, DC STAYPUT / 4WAY,DUAL COIL CLASS-H IP65 / NEMA4		
HANDWHEEL	ORIENTATION	SIDE MOUNTED		
JUNCTION BOX	TYPE / NO. OF WAYS / SIZE CABLE GLANDS: (SIZE / QTY) METHOD OF TERMINATION ENCLOSURE CLASS	CAGE CLAMP / THIRTY SIX / 2.5 SQ.MM REQUIRED : 16MM / 3 NO. / BRASS WITH NICKEL PLATED / BOTTOM 3 NO 9 PIN PLUG & SOCKET(2 WIRED, 1 LOOSE) IP65		
I/P CONVERTER (FAIL FREEZE TYPE)	INPUT SIGNAL : POWER SUPPLY SPLIT RANGE ENCLOSURE CLASS	INBUILT IN SMART POSITIONER	NOT APPLICABLE	
AIR CONNECTION SIZE SHOULD BE 1/2NPT(F)				
SIGN: NAME: DATE:	PREPARED BY  S. J. P. J. 02.08.19	CHECKED BY  A. JAIGANESH 02.08.19	APPROVED BY  V. GUNASEKARAN 02.08.19	VENDOR SEAL SIGN: NAME: DATE:

* TAG NO'S - LAE21AA201, LAE21AA202
- LAE22AA201, LAE22AA202



DATA SHEET FOR CONTROL VALVES (WITH PNEUMATIC ACTUATOR)

SPECIFICATION NO.: PATRATU

VOLUME

SECTION: Boiler mountings/PE (FB)

REV. NO. 00

DATE : 02.08.19

SHEET 1 OF 2

Customer Nos. : 1828,1829,1830

Tag Nos.: *

Qty.: 4 Nos. / BOILER

RH DESH CONTROL VALVE DATA SHEET – A&B

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 SERVICE LOCATION DUTY PIPE SIZE (Inlet / Outlet) in mm PIPE MATERIAL (Inlet / Outlet) MEDIUM	PATRATU STPS EXP. (3X800 MW) RH SPRAY CONTROL VALVE OUTDOOR MODULATING D88.9 x 11.13 / D88.9 x 11.13 SA335 P22 / SA335 P22 FEED WATER									
BODY	MODEL NO. TYPE OF BODY: GUIDING:NO. OF PORTS BODY SIZE:PORT SIZE:DESIGN CV END CONNECTION & RATING (ANSI) BODY MATERIAL PACKING MATERIAL BONNET TYPE TRIM FORM TRIM MATERIAL: SEAT: PLUG: CAGE: STEM: BALANCED / UNBALANCED FLOW VALVE OUTLET VELOCITY REQUIRED LEAKAGE CLASS NOISE LEVEL (dBA) ANTI CAVITATION TRIM VALVE LIFT mm	GLOBE / CAGE / ONE BUTT WELDED; style-D; d1=69.5mm A217 WC9 GRAFOIL STD / EXTENDED / FINNED BELOW SEAT / ABOVE SEAT < 8 m/s V LESS THAN 85 dBA at 1 metre YES									
PNEUMATIC ACTUATOR	MODEL NO. & SIZE CLOSE AT: OPEN AT (Kg/cm ² (g)) TRAVEL TIME FOR OPEN TO CLOSE, CLOSE TO OPEN VALVE POSN. ON SIGNAL FAILURE (4-20 mA) VALVE POSN. ON SUPPLY AIR FAILURE	SPRING ACTION CLOSSES THE VALVE <10 Secs / <10 Secs STAY PUT STAY PUT									
PERFORMANCE OF VALVE	LINEARITY HYSTERESIS SENSITIVITY ACCURACY (OVERALL)	± 2% ± 1% ± 0.5% 2Q11									
SERVICE CONDITIONS											
SI. NO.	LOAD	FLOW T /h	INLET PR. kg/cm ² (g)	OUTLET PR. kg/cm ² (g)	PR. DROP kg/cm ² (g)	INLET TEMP(°C)	SP. GRAVITY	CALC. CV	VALVE LIFT %	VALVE OUTLET VELOCITY	NOISE LEVEL Dba
01	Design condition	82.70	141.6	103.0	38.60	188.9					
03	BMCR	19.50	150.7	70.7	79.90	188.9					

ACTUATOR SIZING PRESSURE

: 210 kg/cm²(g)

BODY DESIGN: PRESSURE / TEMPERATURE

: 210 kg/cm²(g) / 200°C

IBR FORM-III C

: REQUIRED

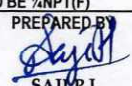
TOTAL WEIGHT (VALVE+ACTUATOR+ACCESSORIES)

: kg

Valves should be directly weldable to connecting pipe without the use of Reducers. Only Globe / Inline Valves acceptable. Angle Valves not acceptable.

* TAG NO'S - LAE21AA101, LAE21AA102

- LAE22AA101, LAE22AA102

	DATA SHEET FOR CONTROL VALVES (WITH PNEUMATIC ACTUATOR)		SPECIFICATION NO.: PATRATU	
			VOLUME	
			SECTION: Boiler mountings/PE (FB)	
			Rev. No.	00
Customer Nos. : 1828,1829,1830		Tag Nos. : *	Qty.: 4 Nos. / BOILER	
RH DESH CONTROL VALVE DATA SHEET – A&B				
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	REQUIRED		
	AIR FILTER REGULATOR	REQUIRED		
	AIR LOCK RELAY	REQUIRED		
	POSITION LIMIT SWITCH	REQUIRED		
	POSITION TRANSMITTER	INBUILT IN SMART POSITIONER		
	SOLENOID VALVE	NOT REQUIRED		
	I/P CONVERTER	INBUILT IN SMART POSITIONER		
	JUNCTION BOX	REQUIRED		
	HAND WHEEL (SIDE MOUNTED)	REQUIRED		
	LOCAL POSITION INDICATOR	REQUIRED		
	VOLUME BOOSTER & DUMP VALVE	REQUIRED / NOT REQUIRED		
SMART POSITIONER	MANUFACTURER & MODEL NO. BYPASS GAUGES ENCLOSURE CLASS INPUT SIGNAL IN kg/cm ² (g) OUTPUT SIGNAL	YES / NO / TWO : IP-65 4 - 20mA, 24 V DC TO SUIT ACTUATOR	SPECIFICATION ATTACHED	
AIR FILTER REGULATOR	MANUFACTURER & MODEL NO. AIR SUPPLY PRESSURE IN kg/cm ² (g) OUTPUT PRESSURE IN kg/cm ² (g) OUTPUT GAUGE	3.0 TO 5.0 TO SUIT ACTUATOR REQUIRED		
AIR LOCK	MANUFACTURER & MODEL NO. SET PRESSURE IN kg/cm ² (g) SUPPLY PRESSURE IN kg/cm ² (g) RESET TYPE VENT PLUG	3.0 TO 5.0 AUTO		
LIMIT SWITCH	MANUFACTURER & MODEL NO. OPEN: INT: CLOSE CONTACT TYPE RATING (AC/DC) ENCLOSURE CLASS	1 NO.FOR OPEN & 1 NO. FOR CLOSE DPDT(2NO + 2NC CONTACTS) 3A 240V AC AND 0.1A 220V DC IP65		
POSITION TRANSMITTER	MANUFACTURER & MODEL NO. TYPE SUPPLY OUTPUT RATING ACCURACY ENCLOSURE CLASS	INBUILT IN SMART POSITIONER	INBUILT IN SMART POSITIONER	
SOLENOID VALVE	MANUFACTURER & MODEL NO. RATING OPERATION / 4 WAY, DUAL COIL COIL INSULATION CLASS ENCLOSURE CLASS	24V, DC STAYPUT / 4WAY,DUAL COIL CLASS H IP65 / NEMA4	NOT APPLICABLE	
HANDWHEEL	ORIENTATION	SIDE MOUNTED		
JUNCTION BOX	TYPE / NO. OF WAYS / SIZE CABLE GLANDS: (SIZE / QTY) METHOD OF TERMINATION ENCLOSURE CLASS	CAGE CLAMP / THIRTY SIX / 2.5 SQ.MM REQUIRED : 16MM / 3 NO. / BRASS WITH NICKEL PLATED / BOTTOM 3 NO 9 PIN PLUG & SOCKET(2 WIRED, 1 LOOSE) IP65		
I/P CONVERTER (FAIL FREEZE TYPE)	INPUT SIGNAL : POWER SUPPLY SPLIT RANGE ENCLOSURE CLASS	INBUILT IN SMART POSITIONER	INBUILT IN SMART POSITIONER	
AIR CONNECTION SIZE SHOULD BE 1/2NPT(F)				
SIGN: NAME: DATE:	PREPARED BY  SAJMPJ 02.08.19	CHECKED BY  AJAIGANESH 02.08.19	APPROVED BY  V.GUNASEKARAN 02.08.19	VENDOR SEAL SIGN: NAME: DATE:

* TAG NO'S - LAE21AA101, LAE21AA102
- LAE22AA101, LAE22AA102



**SPECIFICATION FOR
SH/RH SPRAY CONTROL
VALVES/ SBPRV**

SPECIFICATION NO.: **BM/CV_SPEC: 001**

SECTION: **Boiler Mountings/PE (FB)**

REV. NO.: **04**

DATE: **28.09.17**

PAGE NO : **1 OF 8**

**ENGINEERING SPECIFICATION
FOR
SBPRV & SH/RH SPRAY CONTROL VALVES**

SPECIFICATION NO: BM/CV_SPEC: 001

Prepared by:	Reviewed by:	Approved by:
A.Jai Ganesh Dy. Manager PE / FB (BM)	V.Gunasekaran Senior Manager PE / FB (BM)	K.Sridharan DGM PE / FB (BM)

Revision Log					Template Form Revision No.: 00			
Revision No.	Date	Reason	Prepared		Reviewed		Approved	
			Name	Sign.	Name	Sign.	Name	Sign.
01	12.03.16	Revisit	AJG		VGS		KS	
02	10.03.17	Updated	PJS		AJG		KS	
03	24.05.17	Moisture Sep. added	PJS		AJG		KS	
04	28.09.17	SBPRV trim materials revised in SI.no:18	PAK		AJG		KS	
05	09.07.18	RH Spray Control Valve trim, SI no 15	PJS		AJG		KS	

	SPECIFICATION FOR SH/RH SPRAY CONTROL VALVES/ SBPRV	SPECIFICATION NO.: BM/CV_SPEC: 001	
		SECTION: Boiler Mountings/PE (FB)	
		REV. NO.: 04	DATE: 28.09.17
		PAGE NO : 2 OF 8	

1. The control valves and accessory equipment offered under this specification shall be designed, constructed and tested in accordance with the latest applicable standards and codes.
2. All the Control Valves and accessories offered by the Bidder, shall be of proven make, whose guaranteed and trouble free performance has been proven at least for two years in not less than three coal fired utility stations of reheat type.
3. The design of all valve bodies shall conform to the requirements of ANSI B-16.34 and other applicable standards for dimensions, material thickness and material specification for their respective pressure classes.
4. **The valve sizing for SH/ RH spray control valves 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 stem travel.**
5. **The valve sizing for SBPRV (Soot Blower Pressure Reducing Valve) valves 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 30% of total valve stem travel.**
6. All the Control 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.
7. Valve sizing shall be in accordance with the latest edition of ISA Handbook on Control Valves with due consideration for the measures to avoid choked flow. Bidder shall ensure that valve 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.
8. The turndown of the valve offered should not be less than 30:1 for SH / RH Spray Control Valve applications and SBPRV.
9. The control valve size should not be smaller than connecting line size by more than 1 step.
10. **The trims of all regulating control valves should be cage guided type. Top guided design is not acceptable.**
11. Bidder shall provide valves designed to prevent cavitation, wire drawing, flashing on down stream side of valve and in down stream piping when operating through full range under the specified conditions. In cavitation services, the valves shall be provided with anti-cavitation trims specially designed to prevent the occurrence of cavitation by dropping the pressure in stages.
12. **Bidder shall furnish in his proposal detailed calculations to establish whether cavitation will occur or not under any operating condition for a particular application. These calculations shall be subject to Owner's review and approval and in case it is established at any stage of the contract that**



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cavitation will occur, the Bidder shall provide anti-cavitation trim for the same at no extra price. Further the Bidder shall furnish in his proposal the detailed write up, technical literature, etc. clearly indicating as to how the occurrence of cavitation shall be prevented by the design of his offered anti-cavitation trim.

13. Bidder to furnish calculation to check whether flashing or cavitation will occur for services like SH/RH Spray Control Valves.
14. Super Heater spray control Valves should be cage guided valve with low noise anti cavitation trim which are suitable for withstanding high pressure drops and which minimize the adverse effects of cavitation/ flashing on Control Valve parts. If pressure drop is more, multi stage valves shall be offered.
15. Re Heater spray control Valves should have specially designed (such as cage guiding valves with **three or more concentric cages** with holes in the cage to control the location of the Vena Contract or **multi stage multi path** discrete pressure reduction trims etc.) multi stage trim which are suitable for withstanding high pressure drops and which minimize the adverse effects of cavitation/ flashing on Control Valve parts. All pressure reduction shall be achieved only in valve trim parts. Pressure reduction orifices in the valve outlet line is not acceptable.
16. SBPRV control valve should have specially designed (such as cage guiding valves with two or more concentric cages with holes in the cage to control the location of the Vena Contract or multi stage multi path discrete pressure reduction trims etc.) multi stage trim which are suitable for withstanding high pressure drops and which minimize the adverse effects of cavitation/ flashing on Control Valve parts. All pressure reduction shall be achieved only in valve trim parts. Pressure reduction orifices in the valve outlet line is not acceptable.
17. All control valves shall have stems, guide bushings, plugs, seat rings, stem lock pins, stuffing box parts and other trim parts made of stainless steel alloys and suitably hardened. Valve guide posts and bushings shall be stellite faced. Stellite faced guide posts and bushings shall be differential hardened for applications involving high pressure drop as well as for flashing and cavitation applications.
18. Vendor to consider SBPRV operating conditions as severe service conditions because of high pressure drop across the valve trim. All the trim parts shall be of materials as listed in the Table:1. No deviations will be accepted pertaining to trim materials.

Table:1

TRIM	TRIM MATERIAL
Seat material	F91 + Stellite No.06 + Ion Nitrided



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Plug material	Inconel 718
Cage material	Inconel 718
Stem material	Inconel 718

19. For SH/ RH spray control valves the trim materials shall be as follows
- Cage : - CA6NM + Chrome Plated / 17-4 PH *
 - Plug :- CA6NM + Chrome Plated /17-4 PH *
 - Stem :- CA6NM + Chrome Plated / 17-4 PH *
 - Seat :- SS 316 Stellite / SS410/ CA6NM + Chrome Plated/17-4 PH *
- *17-4PH is to be used where design temperature <343 deg C
20. SH /RH Block and Control valves and SBPRV shall have minimum permissible leakage class V as per FCI 70.2.
21. The valve design shall take into account noise abatement considerations. The design objective will be to limit the generation of valve induced noise to 85 dBA at 1 metre from the valve surface under actual operating conditions. The noise abatement shall be obtained by valve body and Low Noise trim design and not by the use of silencers. Bidder shall furnish noise calculation details for each control valve and establish that sound level is less than 85 dB without using any external device or insulation.
22. The Bidder shall be responsible for proper sizing of the valves and selection of appropriate models for meeting the operating requirements.
23. Bidder shall furnish filled in BHEL's data sheets, sizing calculations including the inlet / outlet velocity calculations for each of the valves with the proposal which will be subjected to Owner's approval during detailed engineering stage.
24. All valves shall be linear/modified parabolic / equal percentage / quick opening as specified in data sheets.
25. All valves shall be only of globe body design & straightaway pattern. Angle type valve is not acceptable for any service.
26. Bidder shall supply quick-change type of trim for all control valves. The trim shall be removable through the top after bonnet removal without any cutting or welding of the valve. Where applicable, plugs shall be designed to include pressure balancing for cage-guided valves. Welded / armored seats are not acceptable.
16. Bonnet joints for all Control Valves shall be of the flanged and bolted type. Bonnet joints shall be designed for easy disassembly and for assurance of correct valve stem alignment. Bonnet joints of the internal threaded or union type will not be acceptable.



SPECIFICATION FOR SH/RH SPRAY CONTROL VALVES/ SBPRV

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17. Plug shall be one-piece construction either cast, forged, or machined from solid bar stock. Plugs shall be screwed and pinned to valve stems or shall be integral with the valve stems.
18. Valve's gland packing material shall be grafoil for all the valves.
19. The boiler water will be acid cleaned on site using 1 to 1.5% (by weight) inhibited hydro fluoric acid. The valve manufacturer will have to take into account above-mentioned requirement during design of these valves. The body material shall be selected by Bidder to be compatible with the nature of the fluid, service conditions and piping material to which it is welded and shall be subject to Owner's approval during detailed engineering stage.
20. Valve body ends shall be butt welded or socket- welded type as indicated in datasheets.
22. Welded end for Control Valves shall be butt welded as per ANSI B16.25 for Control Valves of size 65mm (2-1/2") and above. For valves sizes 50mm (2") and below welded end shall be socket welded as per ANSI B16.11.
23. The end for all the Control Valves shall be matched to the corresponding details for the piping on which the valve is installed. **All necessary expanders/reducers are to be supplied by the vendor to match the pipe sizes.**
24. **Extended / Finned bonnets shall be used on all valves when the design temperature of the valve is greater than 280 deg.C.**
25. Stem travel indicators shall be provided on all valves.
26. Flow directions, Valve tag number shall be marked/embossed in valve body for checking during erection.

LIST OF APPROVED VENDORS FOR SOLENOID VALVE (If applicable):

- 1) Asco
- 2) Rotex.

PNEUMATIC VALVE ACTUATORS

- 1) All Control Valves shall be furnished with pneumatic spring opposed diaphragm/piston type actuators depending upon the process requirements.
- 2) The Bidder shall be responsible for proper selection and sizing of valve actuators in accordance with the pressure drop and maximum shut-off pressures. The Bidder shall ensure while sizing the actuators that proper and adequate size is selected which do not restrict or endanger the plant operation and ensure the required leakage class. The actuator size of the valve actuator shall be subject to owner's approval during detailed engg. stage.

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- 3) The actuators shall be designed to produce the required stem force with supply air pressure of 3 to 5 kg/sq.cm. unless otherwise specified.
- 4) Valve actuators shall be capable of operating at an ambient temperature of 60°C continuously.
- 5) All actuators shall also have provisions for manual operation during emergency / maintenance along with graduated local position indicator.
- 6) 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/sq.cm. per linear millimeter of seating surface, shall be provided in the selection of the actuator to ensure light seating unless otherwise specified.

VALVE ACCESSORIES FOR PNEUMATIC ACTUATORS

- 1) All accessory devices like SMART positioners, solenoid valves (If applicable), air locks, air filter regulators, limit switch assemblies, junction boxes, hand jack / hand wheels, pneumatic tubing, etc. shall be provided as per the requirements. **Moisture separator** is to be provided to separate moisture if any in the air line.

TESTS AND EXAMINATIONS

All valves shall be tested in accordance with the quality assurance program agreed between the Owner and the Contractor, which shall meet the requirements of IBR and other applicable codes. The customer approved Quality Plan is to be followed. The tests shall include but not limited to the following.

- 1) Non-destructive examination shall be performed as per ANSI-B-16.34 (Steel Valves).
- 2) 100% radio graphic test on body of all valves having rating of 900 lbs or above; magnetic particles / dye penetrant examination on all internal and external machined surfaces and 100% ultra sonic testing of forgings and bars (of size 50 mm and above) of all valves with rating of 900 lbs or above shall be performed as per ANSI B16.34.

3) **Hydrostatic Test**

Valves shall be subjected to hydrostatic shell test in accordance with ANSI-B16.34 prior to seat leakage test. If the valves are reworked on the pressure parts for any reason after hydrostatic test, they must be retested. Valves shall be hydrostatically tested in Manufacturer's Works in accordance with code requirements. All hydrostatic testing and inspection shall be completed before any paint is applied to valve body. Certificates of inspection shall be executed in accordance with the latest codes and required codes shall be forwarded to the Engineer. All gaskets used for test shall be of the same material and design as specified for the finished product. Where mechanical gasket joints are broken following tests, new gaskets shall be furnished with the equipment, and the joints shall be retested.

4) **Leakage Test**



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Valve closure test and seat leakage tests shall be performed in accordance with ANSI -B16.34 and as per applicable Leakage Class. The leakage from packing shall be zero or bubble tight.

5) Functional Tests

The fully assembled or completed valves including the actuators control devices and accessories shall be functionally tested to demonstrate the operability and response time of the valve and the actuator. This may be done by cycling the valves 3 or 4 times from open to close position. The same controller can be used to test each valve. These tests shall also include the verification of control valve operation features such as stay put operation, fail to open, fail to close on air failure, control signal failure etc. in line with the specification requirements. Performance tests such as Linearity, Hysteresis, Sensitivity & Accuracy are to be checked as per specification

6) Cv Test

Cv test shall be carried out as type test on each size type and design of the valves as per ISA-75.02 standard and the test reports, shall be furnished for Owner's approval. This is to be performed specifically for this project even though Cv test reports of earlier projects are available.

DOCUMENTS REQUIRED

1. Along with offer

- a) POINTWISE REPLY SHALL BE SENT FOR ALL THE ABOVE SPECIFICATIONS ALONG WITH A LIST OF TECHNICAL DEVIATIONS, IF ANY.
- b) Cross sectional drawing of the valve (Trim) showing materials of various parts.
- c) Lift vs Cv curves.
- d) Filled up data sheets.
- e) Calculations to demonstrate the suitability of the selected valve to combat.
 - Cavitation in case the valve is for liquid application.
 - Vibration.
 - Noise.
 - Flashing in case the valve is for saturated liquid application.
 - Valve sizing calculations. (Cv, valve outlet velocity)
 - Catalogs of the Valve and Accessories offered.
- f) Commissioning spares required along with the price for the same.
- g) Actuator sizing calculations.
- h) Pneumatic hook up diagram similar to the one enclosed.
- i) Terminal box wiring diagram.

WITHOUT THE ABOVE DETAILS, THE OFFERS WILL BE TREATED AS INCOMPLETE AND LIABLE FOR REJECTION

2. After placement of order.

- a) Dimensional drawing for approval.
- b) O&M manuals – 1 set of Hard copy to be sent to site along with equipment.



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- c) Data sheets & drawings for approval.
- d) Test Certificates.
- e) O&M manual in soft copy – One copy of O&M manuals in soft copy is to be submitted in CD-ROM (Compact disc). The O&M manuals should be furnished within three months from the date of placement of order.

3. Details to be indicated on the Name Plate

- a) Tag No. & Valve serial No.
- b) Body material, size and pressure rating.
- c) Trim material, size and characteristic body material, size and pressure rating.
- d) Action on air failure.
- e) Spring range.
- f) Stem travel in mm.
- g) Valve action.

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

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SMART POSITIONER

Rev. No.	Date	Description	Prepared	Reviewed	Approved
00 - 05	19-09-18	Initial Release	-sd-	-sd-	-sd-
06	17-10-19	Revised after revisit			

Sl. No	Technical Description/Requirement	
1	SITE CONDITIONS:- Altitude above Sea Level Atmosphere Relative humidity Operating temperature	500 Meters Tropical, Dusty, Windy & Heavily polluted atmosphere 100 % -30 to 80 degree Celsius
2	Input demand signal	4-20 mA demand signal from DCS.
3	Power Supply	2 wire system, Loop powered from output card of DCS.
4	Operational signal range	4-20 mA. Split range operation shall also be possible if required as per the application.
5	Air Supply	Shall be suitable for 3 – 7 kg/cm ² Shall be suitable to work with instrument air of quality - Class 2 or Class 3 meeting the requirements of the standard ISO 8573.1
6	Type of Action (Direct/Reverse)	Shall match with the requirement of the Control Valve/damper application.
7	Flow Characterization	Shall match with valve characteristics, Linear/Equal percentage etc.
8	Stroke time	Shall match with the requirement of the Control Valve/damper application.
9	Single/Double Acting	Shall match with the requirement of the Control Valve/damper application.
10	Pneumatic Process Connection	Shall match with the requirement of the Control Valve/damper application.
11	Communication by Hart Protocol	SMART positioner shall be compatible for Remote calibration & Diagnostics using HART protocol.

Sl. No	Technical Description/Requirement	
12	Calibration	SMART positioner shall be compatible for Auto Start with self-calibration, Remote calibration using Hart protocol & local/manual calibration using push buttons available on the positioner.
13	Position feedback Sensing & Transmitter	Position Sensing shall be integral to the SMART positioner. 4-20 mA hardwired current signal for Position feedback shall be provided from the positioner.
14	Electrical Cable entry	Side or bottom entry to avoid water ingress.
15	Protection Class	IP 65
16	Action required during failure of 4 to 20 mA control signal.	Shall be configured for the fail safe position as per the requirement of Control Valve/damper application.
17	Characteristic Deviation	$\leq 0.5\%$ of span or better.
18	Influence of temperature rise on positioner	$\leq 0.01\%$ per degree Celsius.
19	Accessories	Pressure Gauge Block:- For Supply & output pressure, pressure gauges shall be provided on the positioner. Operator panel:- The positioner shall have a display with push buttons for configuration and for read out. Valve Mounting accessories:- Required mounting accessories & fasteners for mounting the positioner on valve actuators shall be taken care of by the valve vendor.
20	Electro Magnetic Compatibility	SMART positioner shall conform to EMC requirements as per the relevant international standards IEC/EN.

Sl. No	Technical Description/Requirement	
21	Hardwired Digital Output Signals from the positioner.	Fault signal output.
22	Diagnostic Features	Positioner shall be provided with diagnostic features for monitoring.
23	Test reports & Catalogues	1. Test Certificates as per Manufacturer's Standard. 2. SMART positioner catalogues & O&M manuals.
24	General Note	The SMART positioner with its accessories/electronic cards shall be sourced completely from the OEM.

Controls & Instrumentation/Fossil Boilers
E,C&I input for Control Valve accessories

CI: PATRATU: ECI:CV, Rev. 01

Project: PATRATU

Cust. No.: 1828-1830

Sl. No	Description	Vendor's Compliance
1.	SMART positioner :- - Vendor to supply SMART positioner as per the requirements indicated in the Technical specification TCI:317/Rev. 06. Preferred makes: ABB, MASONEILAN, SIEMENS, SMAR, EMERSON, METSO, YAMATAKE, MOORE. - SMART positioner shall be provided with dust tight, weather proof and corrosion resistant, metal casing (Die cast Aluminium/SS316 enclosure) meeting IP 65 protection class requirements.	
2.	Integral Junction Box :- All the valve accessories shall be wired suitably and shall terminated in an integral junction box. The terminal blocks in the junction box shall be of cage clamp type suitable for 2.5 sq.mm. cable. Junction box shall meet the requirements of the protection class of IP - 65. The signals shall be terminated as per the TB nos. mentioned in the BHEL wiring drawing.	
3.	Method of Termination of external cables to the integral junction box (i.e. Command & Feedback signals from external control system) :- 3 Nos. of 9 Pin plug & socket arrangements (2 Nos. wired + 1 No. spare as loose supply) shall be provided suitable for the cable of OD 16mm. The socket shall be fixed to the junction box and shall be wired up to the terminal blocks as per the wiring drawing.	
4.	Requirement of Remote Configuration & Diagnostic Software for SMART positioner: - MS WINDOWS (latest version) based diagnostic software capable of handling 1 tag at a time, meeting the requirement of Configuration, Diagnostics, Calibration and testing of the control valve actuator, is required. The Software shall be supplied in a CD/DVD format. As applicable, the diagnostic software shall be compatible for diagnostic features like Stroke counter or Travel counter, Leakage in actuators, Valve Signature analysis, Step Response test, Valve friction /Jamming detection etc.	

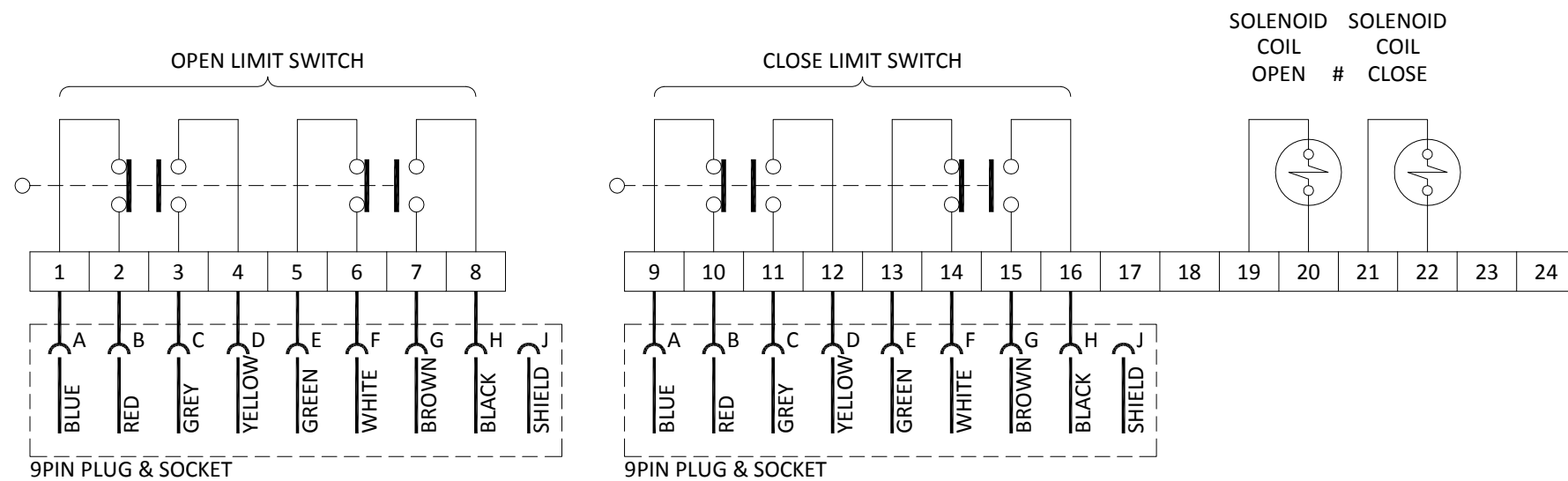
Sl. No	Description	Vendor's Compliance
	Factory Valve Signature Tests Reports (Pressure versus Valve travel and Travel versus I/P signal) are to be provided.	
5.	Limit Switch Type & Contact Rating :- Limit switches shall be of high conductivity and non-corrosive type with either 1 No. of DPDT (2 NO + 2 NC contacts) or 2 Nos. of SPDT (2 NO + 2 NC contacts). Contact Rating: 3A at 240 V AC and 0.1 A at 220 V DC. Quantity and applicability of the limit switch shall be as per the application requirement as indicated in the valve/actuator datasheet.	

Note to Vendor:

Vendor to indicate "Confirmed" meeting the requirements as spelt above in the vendor's compliance column.

Name of the vendor with Signature & seal :

TB DIAGRAM OF OPEN/CLOSE DUTY POWER CYLINDER (PNEUMATIC ACTUATOR)



NOTE

(a). FOR OPEN/CLOSE DUTY

- (i). 2 Nos., 9 PIN PLUG & SOCKET (SOCKET MOUNTED ON TERMINAL BOX BUT PLUG MAY BE SUPPLIED AS LOOSE) TO SUIT 4PAIR x 0.5 SQ.MM, INSTRUMENTATION CABLE OF OD 17MM.
- (ii). 1 No. CABLE GLAND TO SUIT 5C x 2.5 SQ.MM (Cu.) CONTROL CABLE OF OD 17MM.

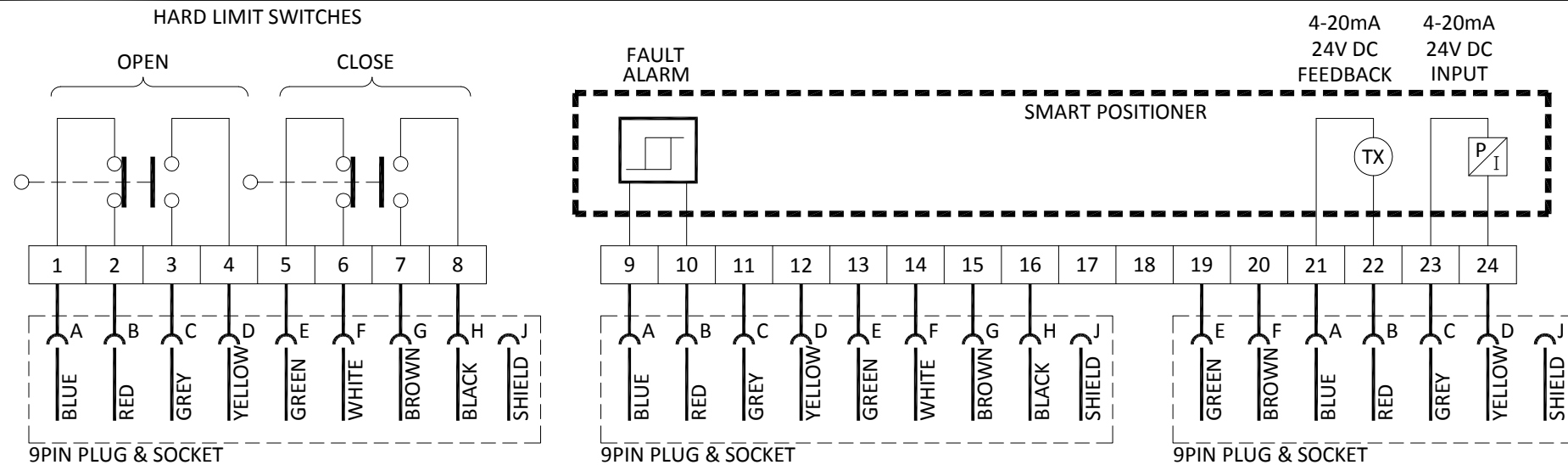
(b). FOR REGULATING DUTY

- (i). 3 Nos., 9 PIN PLUG & SOCKET (SOCKET MOUNTED ON TERMINAL BOX BUT PLUG MAY BE SUPPLIED AS LOOSE) TO SUIT 4PAIR x 0.5 SQ.MM, INSTRUMENTATION CABLE OF OD 17MM

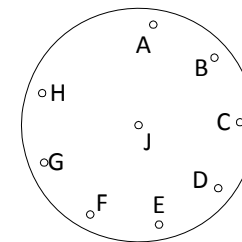
APPLICABILITY OF LIMIT SWITCHES SHALL BE REFERRED IN VALVE DATA SHEETS / SPECIFICATION.

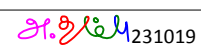
- SINGLE OR DUAL SOLENOID FOR THE RESPECTIVE APPLICATION SHALL BE AS PER VALVE SPECIFICATION.

TB DIAGRAM OF REGULATING DUTY POWER CYLINDER (PNEUMATIC ACTUATOR)



9 PIN PLUG & SOCKET ARRANGEMENT



REV	DATE	ALTERED :
01	231019	CHD. / APPD. : 
ZONE	REVISED AFTER REVISIT.	

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

OWNER :

PROJECT :



PATRATU VIDYUT UTPADAN NIGAM LIMITED

PATRATU SUPER THERMAL POWER PROJECT - PHASE 1

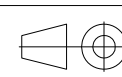
3 x 800 MW, UNIT - 1, 2 & 3, Cust. No. 1828, 1829 & 1830, EPC PACKAGE



Bharat Heavy Electricals Ltd

UNIT: HIGH PRESSURE BOILER PLANT

TIRUCHIRAPALLI - 620014

DEPT. - C&I
CODE - 392SCALE
NTSWEIGHT (Kg)
—TITLE
TERMINAL BLOCK DIAGRAM FOR POWER CYLINDER
(DRAWN FOR INTERMEDIATE POSITION OF PC)CARD
CODE
U 01

NAME

A . Thamburaj

SIGNATURE

 020119

DATE

02-01-19

NO. OF
VAR

CHD M.Muruga Prabu

Sd. / MM

02-01-19

APPD V.M.Selvaraj

Sd. / VMS

02-01-19

REF TO ASSY / OLD DWG

ITEM NO

No OF
ITEMS

—

—

NTPC DRG. No. : 9585-001-102-PVI-L-XXX

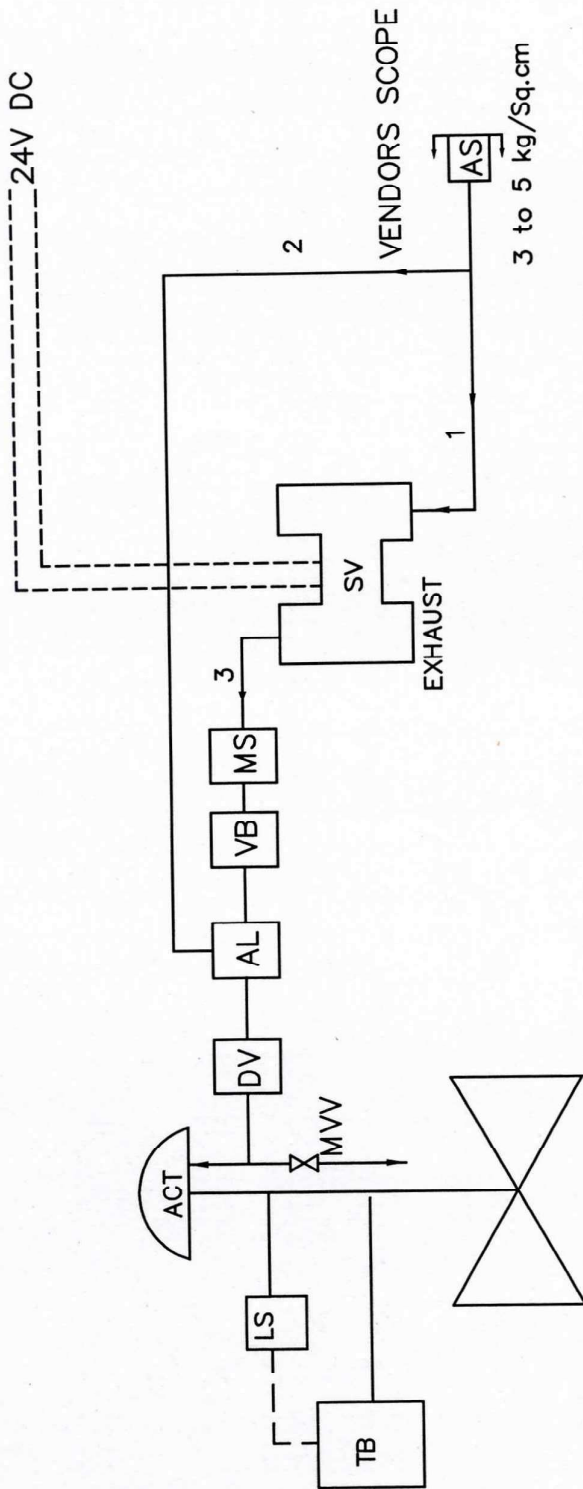
BHEL DRG. No. :

3-97-599-24078

REV
01



PNEUMATIC HOOKUP DIAGRAM FOR SH. & RH. BLOCK VALVES (FOR REFERENCE)



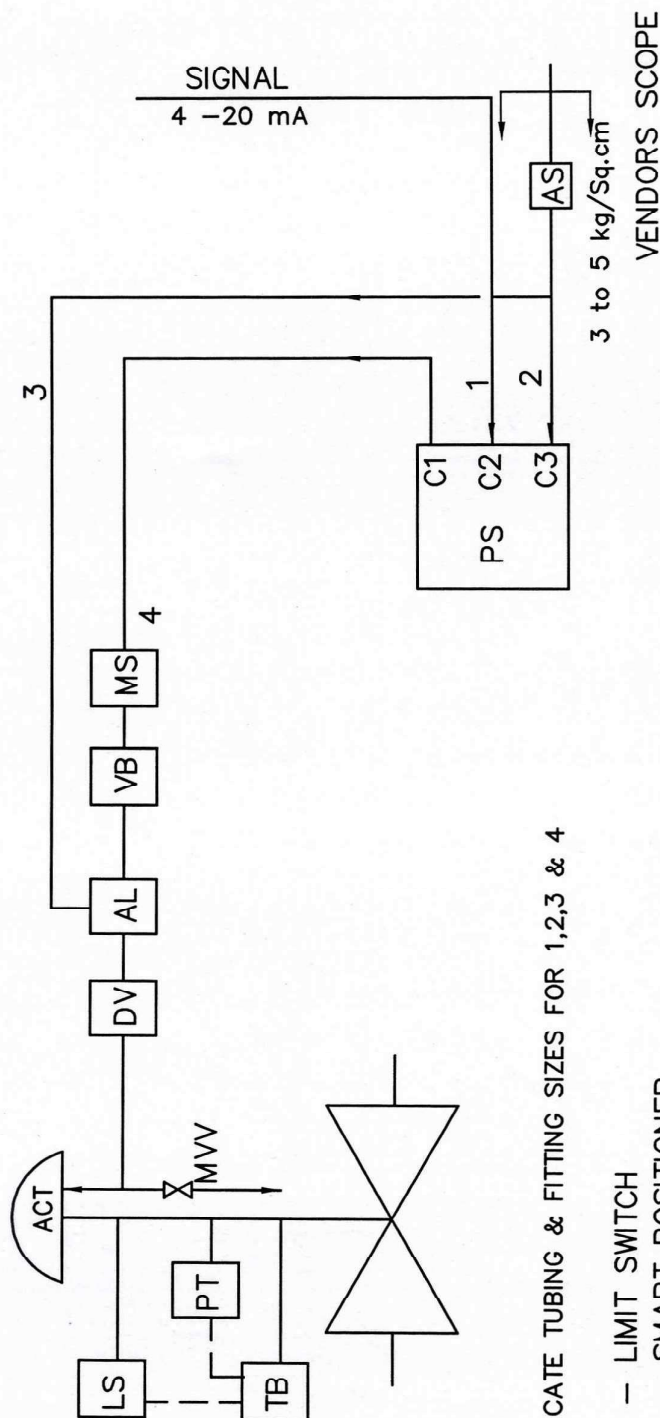
- VB - VOLUME BOOSTER (may be provided if required)
- SV - SOLENOID VALVE (4 way ,dual coil ,energise to open & energise to close)
- DV - DUMP VALVE (may be provided if required)
- AS - AIR SET
- AL - AIR LOCK
- MVV - MANUAL VENT VALVE
- ACT - ACTUATOR
- LS - LIMIT SWITCHES
- TB - TERMINAL BOX (36 WAY)
- MS - MOISTURE SEPARATOR

VENDOR TO INDICATE TUBING
& FITTING SIZES FOR 1,2 & 3

VENDORS SCOPE

PREPARED: DEEPAK.P
CHECKED: SAJI P.J
APPROVED: K.SRIDHARAN

(FOR REFERENCE)



VENDOR TO INDICATE TUBING & FITTING SIZES FOR 1,2,3 & 4

LS — LIMIT SWITCH
PS — SMART POSITIONER
AS — AIR SET
AL — AIR LOCK
MVV — MANUAL VENT VALVE
TB — TERMINAL BOX (36 WAY)
PT — POSITION TRANSMITTER
ACT — ACTUATOR

MS – MOISTURE SEPARATOR
DV – DUMP VALVE
VB – VOLUME BOOSTER
(DV & VB may be provided if

VENDORS SCOPE

PREPARED: DEEPAK.P

CHECKED: SAJI P.J

APPROVED: K.SRIDHARAN

	CHECK LIST FOR SH/RH BLOCK/CONTROL VALVES AND SBPRV	SPEC. NO. :PATRATU STPS	
		SECTION: Boiler Mountings/PE (FB)	
		REV NO.: 00	Date: 02.08.19
		SHEET : 1 OF 1	
CUSTOMER NAME : PATRATU STPS EXPN. (3x800 MW)		CUST. Nos.:1828,1829,1830	
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	<u>ELECTRICAL ACTUATOR DETAILS</u> (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

BANK GUARANTEE FOR PERFORMANCE SECURITY

(Non-Judicial Stamp paper/e-stamp paper of appropriate value as per Stamp Act prevailing in the State(s))

Bank Guarantee No:

Date:

To

NAME

& ADDRESSES OF THE BENEFICIARY

IFSC AND MICR CODE

Dear Sirs,

1. In consideration of Bharat Heavy Electricals Limited (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns) incorporated under the Companies Act, 1956 and having its registered office at _____¹ through its Unit at.....(name of the Unit) having awarded to (Name of the Vendor / Contractor / Supplier) (VENDOR CODE) with its registered office at _____² hereinafter referred to as the ' Vendor / Contractor / Supplier ', which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns), a contract Ref No.....dated³ valued at Rs.....⁴ (Rupees -----)/FC.....(in words.....) for⁵ (hereinafter called the 'Contract') and the Vendor / Contractor / Supplier having agreed to provide a Contract Performance Bank Guarantee, equivalent to% (... Percent) of the said value of the Contract to the Employer for the faithful performance of the Contract,

2. we,, (hereinafter referred to as the Bank), having registered/Head office at and inter alia a branch at being the Guarantor under this Guarantee, hereby, irrevocably and unconditionally undertake to forthwith and immediately pay to the Employer any sum or sums upto a maximum amount of Rs -----⁶ (Rupees -----) without any demur, immediately on first demand from the Employer and without any reservation, protest, and recourse and without the Employer needing to prove or demonstrate reasons for its such demand.

3. 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. _____.

4. We undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Vendor / Contractor / Supplier in any suit or proceeding pending before any Court or Tribunal, Arbitrator or any other authority, our liability under this present being absolute and unequivocal.

5. The payment so made by us under this Guarantee shall be a valid discharge of our liability for payment thereunder and the Vendor / Contractor / Supplier shall have no claim against us for making such payment.

6. We thebank 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 Contract/satisfactory completion of the performance guarantee period as per the terms of the Contract and that it shall continue to be enforceable till all the dues of the Employer under or by virtue of the said Contract have been fully paid and its claims satisfied or discharged.

7. We.....BANK further agree with the Employer that the Employer 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 Contract or to extend time of performance by the said Vendor / Contractor / Supplier from time to time or to postpone for any time or from time to time any of the powers exercisable by the Employer against the said Vendor / Contractor / Supplier and to forbear or enforce any of the terms and conditions relating to the said Contract and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Vendor / Contractor / Supplier or for any forbearance, act or omission on the part of the Employer or any indulgence by the Employer to the said Vendor / Contractor / Supplier or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision have effect of so relieving us.

8. The Bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Vendor / Contractor / Supplier and notwithstanding any security or other guarantee that the Employer may have in relation to the Vendor / Contractor / Supplier's liabilities.

9. This Guarantee shall remain in force upto and including.....⁷ and shall be extended from time to time for such period as may be desired by Employer.

10. This Guarantee shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the Vendor / Contractor / Supplier but shall in all respects and for all purposes be binding and operative until payment of all money payable to the Employer in terms thereof.

11. Unless a demand or claim under this guarantee is made on us in writing on or before the⁸we shall be discharged from all liabilities under this guarantee thereafter.

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

13. We..... BANK lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Employer in writing.

Notwithstanding anything to the contrary contained hereinabove:

a) The liability of the Bank under this Guarantee shall not exceed.....⁶

- b) This Guarantee shall be valid up to⁷
- c) Unless the Bank is served a written claim or demand on or before (minimum 3 to 6 months from the expiry date)⁸ all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank.

14. We, _____ Bank, have power to issue this Guarantee under law and the undersigned as a duly authorized person has full powers to sign this Guarantee on behalf of the Bank.

For and on behalf of
(Name of the Bank)

Dated.....

Place of Issue.....

BANK EMAIL ID:

BANK PHONE NO:

AUTHORISED SIGNATORIES CELL PHONE NO:

BANK FAX NO:

¹ NAME AND ADDRESS OF EMPLOYER I.e Bharat Heavy Electricals Limited

² NAME AND ADDRESS OF THE VENDOR /CONTRACTOR / SUPPLIER.

³ DETAILS ABOUT THE NOTICE OF AWARD/CONTRACT REFERENCE

⁴ CONTRACT VALUE

⁵ PROJECT/SUPPLY DETAILS

⁶ BG AMOUNT IN FIGURES AND WORDS

⁷ VALIDITY DATE

⁸ DATE OF EXPIRY OF CLAIM PERIOD

List of Consortium Banks

Sl. No	Nationalised Banks	Sl. No	Public Sector Banks
1	State Bank of India	18	IDBI
2	Allahabad bank		
3	Andhra bank	Sl. No	Private banks
4	Bank of Baroda	19	Axis Bank
5	Canara Bank	20	HDFC
6	Corporation bank	21	ICICI
7	Central bank	22	The Federal Bank Limited
8	Indian Bank	23	Kotak Mahindra Bank
9	Indian Oversea Bank	24	Indusind Bank
10	Oriental bank of Commerce	25	Yes Bank
11	Punjab National Bank		
12	Punjab & Sindh Bank	Sl. No	Foreign banks
13	Syndicate Bank	26	CITI Bank N.A
14	UCO Bank	27	Deutsche Bank AG
15	Union Bank of India	28	HSBC
16	United Bank of India	29	Standard Chartered Bank
17	Vijaya Bank	30	J P Morgan

/ On Bidder's office letter pad /

Self-Declaration

Enquiry No.	<u>1802000490</u>
Enquiry Date	<u>08.08.2020</u>

In line with Government public procurement order Number P-45021/2/2017-B.E-II dated 15.06.2017, and further modified order dt. 28.05.2018, 29.05.2019 & 04.06.2020

I / We hereby declare that I / We are a “Local Supplier” meeting the requirement of minimum local content (.....%) defined in the above government notification for the goods against above mentioned enquiry Number.

Details of location at which local value addition will be made is as follows:

Door No.	
Street / Address 1	
Street / Address 2	
District	
State	
Country	
PIN Code	

We also understand that the false declarations will be considered as breach of Integrity and liable for action.

For Company Name:

Seal:

Signature:

Date:

Place:

(Please fill all the yellow color field)

Certificate by Chartered Accountant on letter head

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

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

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

(Strike off whichever is not applicable)

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

Or

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

Date:



(Signature)

Name -

Membership number -

Seal of Chartered Accountant