

**MATERIALS MANAGEMENT**

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NOTICE INVITING e-TENDER**Bid No.: GEM/2021/B/ 1383549****26.07.2021**

Subject: Two-part e-Tender inviting techno-commercial and price bid for supply of Instrumentation Field Transmitters, Denox System Field Transmitters & Temperature Elements For Coal Fired Thermal Power Plant / Bhusawal Unit-6 (660MW) project.

General Instructions

- The tender documents shall be deemed to form an integral part of the purchase order.
- Tender can be cancelled at any stage due to unavoidable circumstances.
- Bidders are advised not to wait till the last minutes w.r.t tender closing time to submit their offer to avoid complications related with internet connectivity / network problem/ power failure etc.
- Bidders are advised take due care while quoting the technical and price bid. Bidders, those who tampers with tendering procedure affecting ordering process or misusing the technical information of the tender document or withdrawing their offer after price bid opening, will be penalized as per BHEL guidelines on suspension of business dealings with suppliers/ contractors. Abridged version of the guideline is available in www.bhel.com.
- It is advised that all the documents to be submitted are kept scanned or converted to PDF format in a separate folder on your computer before starting online submission.
- The qualification of vendors will be based Pre-Qualification Requirement (PQR) document. Subsequently techno-commercial evaluation will be done; hence, it is mandatory to submit the documents sought in PQR.
- DISCLAIMER CLAUSE: Neither Bharat Heavy Electricals Ltd nor the service provider for e-tendering is responsible for any failure of submission of bids, due to failure of internet or other connectivity problems or reasons thereof.
- Deviations, if any, may be indicated in the Sub-Delivery Enquiry Deviation Format.
- Customer approval of Bidder is applicable. Techno-commercially qualified Bidders will be asked to submit the credentials for customer approval. The Part-2 bids (Price bid) of the Bidder will be opened, subject to fulfilment of Pre-Qualification Requirement, successful techno-commercial (Part-1 bid) evaluation and Customer acceptance, based on the credentials.
- In order to avail benefits as per MSE clause. Bidders have to upload the Udyam Registration certificate.
- The Annexure-A / Additional Terms & Conditions (ATC) & Annexure-B / Vendor Details Questionnaire shall be submitted.
- Any pre-bid query, kindly contact: Mr. Kevin Ark Kumar, Manager/Materials Management/BOI Tel: 0431-2578109, email: kevin@bhel.in; Mr. N Mohan, Asst./Engineer/Materials Management/BOI Tel: 0431-2577446, email: mohann@bhel.in and get your queries cleared before submitting the offer in EPS.

For Bharat Heavy Electricals Limited**Kevin Ark Kumar**

Manager / Materials Management

Fourth floor, 24 Building

B.H.E.L., Tiruchirappalli – 620 014, Tamil Nadu

Phone: 0431-2578109 / Email: kevin@bhel.in

ANNEXURE-B

1	GEM ID NO	
2	ITEM	

VENDOR DETAILS

SI No	DESCRIPTION	DETAILS TO BE FILLED
1.	VENDOR / FIRM NAME	
2.	BHEL VENDOR CODE (IF ANY)	
3.	QUOTATION REFERENCE & DATE	
4.	CONTACT PERSON NAME	
5.	CONTACT PERSON MOBILE NO	
6.	CONTACT PERSON EMAIL ID	
7.	WORKS ADDRESS & TELE NO	
8.	OFFICE ADDRESS & TELE NO	
9.	PAN NO	
10.	GST NO	
11.	MSE VENDOR / NON MSE VENDOR	MICRO / SMALL

Sign & Seal of Company

VENDOR QUESTIONNAIRE

Sl no	Terms	Questions	Vendor confirmation
1	HSN CODE	Pl mention	
2	GST	Pl Mention	%
3	MII	Pl mention the percentage of Local content	%
4	Attachments 1	Have you submitted the Udyam registration certificate? (applicable only for Micro & Small Enterprises)	Yes / No
5	Attachments 2	Have you submitted the point wise supporting documents required against Pre-Qualification Report (PQR)?	Yes / No
6	Attachments 3	Have you submitted the filled-in, signed / with company seal "NIL Deviation Format ".	Yes / No
7	Attachments 4	Have you submitted the signed / with company seal, all pages of "Technical Specification, Drawing, datasheet & Quality Plan" with respect to this tender along with your quoted offer.	Yes / No
8	Attachments 5	Have you submitted the filled-in, signed, sealed "Self declaration format for MII clause" as per format in your company letter head. (Indicate the % of Local Content)	Yes / No

PLEASE UPLOAD THIS DOCUMENT IN GEM PORTAL DULY FILLED SIGNED AND STAMPED ALONG WITH YOUR OFFER

Sign & Seal of Company

ANNEXURE-A**ADDITIONAL TERMS & CONDITIONS (ATC)**

Description of the Material		INSTRUMENTATION FIELD TRANSMITTERS, DENOX SYSTEM FIELD TRANSMITTERS & TEMPERATURE ELEMENTS FOR COAL FIRED THERMAL POWER PLANT
BHEL Tender No. & Date		BID NO: GEM/2021/B/1383549 dt 26.07.2021
GENERAL INFORMATION		
The bidder has to keep track of any changes by viewing the Corrigendum's issued by the Buyer on time-to- time basis in the Government e Marketplace (GeM) portal. The Company calling for tenders shall not be responsible for any claims/problems arising out of this. Any pre-bid query, kindly contact: Mr. Kevin Ark Kumar , Manager/Materials Management/BOI Tel: 0431-2578109, email: kevin@bhel.in ; Mr. N Mohan , Dy Engineer/Materials Management/BOI Tel: 0431-2577446, email: mohann@bhel.in .		
Sl. No.	Terms and conditions	Vendor's confirmation
1	Firm Price: The quoted / finalised rates shall be Firm till execution of the supplies.	Accepted
2	Package Wise (Two Separate Packages) Package-1: Pressure, DP, Level & Flow Type Transmitters Package-2: Ultrasonic Type Transmitters It is mandatory to quote for all the items within a package.	Accepted
3	Delivery term: F.O.R basis Inclusive of Packing, Forwarding, Freight & all taxes (GST) upto Destination	Accepted
4	Guarantee / Warranty Period : Guarantee / Warranty clause is 18 months from the date of delivery or 12 months from the date of actual put in use; whichever is earlier.	Accepted
5	Delivery Period: <u>75 days for Main supply & 150 days for Spares supply</u> from manufacturing clearance / document approval. Vendor quoted delivery period shall include all activities i.e. manufacturing / production, Inspection, Packing, Forwarding, dispatch. (15 DAYS FOR DOCUMENT APPVL)	Accepted
6	Techno-Commercial bids of vendors will be evaluated; however, the Price bid will be opened, subject to our customer's approval, else the offer will be rejected. Vendors shall submit credentials for taking up with customer, for their approval.	Accepted
7	Document Submission (to be uploaded in GeM) 1. The documents called for in Pre-Qualification Requirement (PQR) shall be mandatorily submitted. 2. All the technical documents which have been attached along with this tender i.e Specification, Drawings, Data Sheet, QP, packing procedure etc..; signature to be endorsed on all pages with company seal on all Technical documents & Sub-delivery enquiry deviation format. 3. Filled-in/signed Annexure-A, Commercial terms and conditions. (Mandatory for Commercial evaluation) 4. If MSE vendor, please attach Udyam Regn Certificate. 5. Self-Certification for Make In India Clause as per Format.	Submitted/ Not Submitted
8	Any deviation on technical/QP/packing requirements shall specifically be indicated in the “sub-delivery enquiry deviation format” attached along with the enquiry. Deviations / clarifications declared elsewhere will not be evaluated. <u>Also, any deviations from the commercial terms and conditions shall be clearly spelt out in this format itself.</u> Deviations / clarifications declared elsewhere will not be evaluated. Deviations taken, if any, by vendor as per our requirement above shall be clearly got accepted by BHEL in writing during enquiry stage itself. In the event of an order no deviations, unless accepted by BHEL in writing during enquiry stage will be entertained and all other techno-commercial requirements will be binding on successful bidder and failure to execute the terms will lead to disciplinary action by BHEL against the said bidder.	No Deviation Format Submitted/ Not Submitted
9	Technical / commercial clarification, if any, will be initiated through EPS / email. Vendor to respond to the clarifications within 3 working days. If the vendor fails to respond, even after three reminders, then the vendor will be considered as non-responsive and the offer is liable to be rejected.	Accepted

10	Technical / commercial clarification, if any, will be initiated through EPS / email. Vendor to respond to the clarifications within 3 working days. If the vendor fails to respond, even after three reminders, then the vendor will be considered as non-responsive and the offer is liable to be rejected.	Accepted
11	RISK PURCHASE: In case of abnormal delays (beyond the maximum late delivery period as per LD clause) or non-fulfilment of any other terms and conditions given in work order, BHEL may cancel the work order in full or part thereof, and may also make a contract of such work/service from elsewhere / alternative source at the risk and cost of the original contractor. BHEL will take all reasonable steps to complete the contract obligations from alternate source at optimum cost. If bidder does not agree to the above Risk Purchase Clause, BHEL reserves the right to reject the offer. In case for compelling reasons BHEL accepts the offer without acceptance of this clause by the bidder and in the eventuality of Risk Purchase, appropriate action will be taken as per BHEL extant rules. This will be without prejudice to any other right of BHEL under the contract. Risk & cost clause, in line with conditions of contract may be invoked in any of the following cases: 1. Contractor's poor progress of the work vis-à-vis execution timeline as stipulated in the contract, backlog attributable to contractor/ supplier including unexecuted portion of work/ supply does not appear to be executable within balance available period (#) considering its performance of execution. 2. Withdrawal from or abandonment of the work by contractor before completion of the work as per contract. 3. Non completion of work / Non-supply by the contractor within scheduled completion/delivery period as per contract or as extended from time to time, for the reason attributable to the contractor. 4. Termination of contract on account of any other reason (s) attributable to contractor. 5. Assignment, transfer, subletting of contract without BHEL's written permission resulting in termination of Contract or part thereof by BHEL. 6. Non-compliance to any contractual condition or any other default attributable to contractor. Risk and Cost amount against balance work will be calculated as follows: $\text{Risk \& Cost Amount} = [(A-B) + (A \times H/100)]$ Where, A= Value of Balance scope of Work/ Supply (*) as per rates of new contract B= Value of Balance scope of Work/ Supply (*) as per rates of old contract being paid to the contractor/ supplier at the time of termination of contract i.e. inclusive of PVC & ORC, if any. H = Overhead Factor to be taken as 5 In case (A-B) is less than 0 (zero), value of (A-B) shall be taken as 0 (zero). *(Balance scope of work/ supply) Difference of Contract Quantities and Executed Quantities as on the date of issue of Letter for 'Termination of Contract', shall be taken as balance scope of Work/ Supply for calculating risk & cost amount. Contract quantities are the quantities as per original contract. If, Contract has been amended, quantities as per amended Contract shall be considered as Contract Quantities. Items for which total quantities to be executed have exceeded the Contract Quantities based on drawings issued to contractor from time to time till issue of Termination letter, then for these items total Quantities as per issued drawings would be deemed to be contract quantities. Substitute/ extra items whose rates have already been approved would form part of contract quantities for this purpose. Substitute/ extra items which have been executed but rates have not been approved, would also form part of contract quantities for this purpose and rates of such items shall be determined in line with contractual provisions. However, increase in quantities on account of additional scope in new tender shall not be considered for this purpose. NOTE: In case portion of work is being withdrawn, contract quantities pertaining to portion of work withdrawn shall be considered as 'Balance scope of work/supply' for calculating Risk & Cost amount.	Accepted
12	Technical / Commercial clarification, if any, will be initiated through GeM / email. Vendor to respond to the clarifications within 3 working days. If the vendor fails to respond, even after three reminders, then the vendor will be considered as, non-responsive and their offer is liable to be rejected.	Accepted
13	PO Acknowledgement: Within 7 days from the date of issue of GeM contract.	Accepted

14	Fraud Prevention Policy Suppliers involving in fraudulent practices or delayed supply (or) non-Supply will be dealt with provision as indicated in “Guidelines for Suspension of Business Dealings with Suppliers / Contractors” which is hosted in website www.bhel.com. The offers of the bidders who are under suspension as also the offers of the bidders, who engage the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL web site www.bhel.com. 1.0 Integrity commitment, performance of the contract and punitive action thereof: 1.1 Commitment by BHEL: BHEL commits to take all measures necessary to prevent corruption in connection with the tender process and execution of the contract. BHEL will during the tender process treat all Bidder(s) in transparent and fair manner, and with equity. 1.2 Commitment by Bidder / Supplier / Contractor: 1.2.1. The bidder / supplier / contractor commit to take all measures to prevent corruption and will not directly or indirectly influence any decision or benefit which he is not legally entitled to nor will act or omit in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India. 1.2.2. The bidder / supplier / contractor will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract and shall adhere to relevant guidelines issues from time to time by Govt. of India / BHEL. 1.2.3. The bidder / supplier / contractor will perform / execute the contract as per the contract terms & Conditions and will not default without any reasonable cause, which causes loss of business / money / reputation, to BHEL. If any bidder / supplier / contractor during pre-tendering / tendering / post tendering / award / execution / post-execution stage indulges in mal-practices, cheating, bribery, fraud or and other misconduct or formation of cartel so as to influence the bidding process or influence the price or acts or omits in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India, then action may be taken against such bidder / supplier / contractor as per extant guidelines of the company available on www.bhel.com and / or under applicable legal provisions.	Accepted
15	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. All incidental charges like freight, insurance and customs duty / GST are to vendor account only. The defective parts and components shall be collected by your Indian agent or / authorized person, only after completing the replacement / repairs. The defective parts / components will not be returned back to vendor works by us due to procedural problems.	Accepted
16	BHEL reserves the right to cancel / modify the tender, if the need so arises, without assigning any further notice or reason therefore.	Accepted
17	JURISDICTION: In case of any suit or other legal proceedings arising under or relating to this Contract, the courts at Trichy, Tamil Nadu only shall have the Jurisdiction and is only after exhausting the arbitration clause.	Accepted
18	SECRECY OF CONFIDENTIAL INFORMATION: The Contractor undertakes and agrees that he/it will not disclose or reveal in part or full the proprietary/confidential information, which terms shall mean and include patents, trademarks, service marks, registered designs, copyright, design rights, know-how, confidential information, trade and business names and any other similar protected information of BHEL received during negotiation or currency of the contract to any third party or governmental authorities without written permission from BHEL. In the event of termination or expiry of the contract, the contractor shall return all proprietary/confidential information to BHEL. This clause shall survive termination or expiry of the contract. All the input details: transmittals and sample drawings supplied for preparation of drawings are confidential information of BHEL for specific purpose only. The contractor shall never pass on / part with the information to anybody and shall maintain the secrecy of the information. As soon as the bills are certified by BHEL, all the relevant drawing files shall be erased from PCs and shall not be made use under any circumstances. BHEL reserves the right to initiate appropriate action including legal proceeds / termination of contract, recovery of damages, penalties etc., if the contractor is found guilty / wrong usage of the documents given by BHEL for any unauthorized activity.	Accepted

By signing this Annexure, the vendor consents the above Additional Terms & Conditions (ATC) are accepted, this Annexure-A, shall be binding between BHEL and the Vendor; and no other terms quoted / mentioned by vendor, elsewhere in the Offer / Quotation will be considered or accepted by BHEL.

This document is part of Tender terms & Conditions and shall be mandatorily uploaded along with the offer documents in GeM Portal in ATC.

PACKAGE DETAILS						
PACKAGE-1						
SL No.	MATLCD	DESCRIPTION	UOM	QTY	DELIVERY DESTINATION	QUOTED / NOT QUOTED
1	L172719709701001	Pressure Transmitter Range: (-)250 - 250 mmWC spec ref: TCI:162/ 00, Applicable Quality Plan ref: CI:QA:1727:CQP:11/ 01 Applicable packing procedure ref:QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162/ 1727/ 00 S. nos: 1 to 3. Applicable Tag nos: HBK10CP002, HBK15CP001 & HBK15CP002	NO	3.00	PROJECT SITE BHUSAWAL	
2	L172719709701002	Pressure Transmitter Range: 0 - 10 Kg/ cm ² spec ref: TCI:162/ 00, Applicable Quality Plan ref: CI:QA:1727:CQP:11/ 01 Applicable packing procedure ref:QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162/ 1727/ 00 S. nos: 4 to 9. Applicable Tag nos: HJM01CP003, HJM01CP004, HJM01CP005, HJN01CP001, HJN01CP002 & HJN01CP003	NO	6.00	PROJECT SITE BHUSAWAL	
3	L172719709701003	Pressure Transmitter Range: 0 - 30 Kg/ cm ² spec ref: TCI:162/ 00, Applicable Quality Plan ref: CI:QA:1727:CQP:11/ 01 Applicable packing procedure ref:QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162/ 1727/ 00 S. nos: 10 to 13. Applicable Tag nos: HJF51CP001, HJF51CP005, HJF51CP006 & HJF51CP007	NO	4.00	PROJECT SITE BHUSAWAL	
4	L172719709701004	Diaphragm Seal type Pressure Transmitter with 5m armoured Capillary Range: 0 - 30 Kg/ cm ² spec ref: TCI:162/ 00, Applicable Quality Plan ref: CI:QA:1727:CQP:11/ 01 Applicable packing procedure ref:QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162/ 1727/ 00 S. nos: 14 to 17. Applicable Tag nos: HJF59CP003, HJF59CP007, HJF59CP008 & HJF59CP009	NO	4.00	PROJECT SITE BHUSAWAL	
5	L172719709701005	Pressure Transmitter Range: 0 - 350 Kg/ cm ² spec ref: TCI:162/ 00, Applicable Quality Plan ref: CI:QA:1727:CQP:11/ 01 Applicable packing procedure ref:QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162/ 1727/ 00 S. nos: 18 to 23. Applicable Tag nos: LBA11CP011, LBA11CP012, LBA11CP013, LBA12CP011, LBA12CP012 & LBA12CP013	NO	6.00	PROJECT SITE BHUSAWAL	
6	L172719709701006	Differential Pressure Transmitter Range: 0 - 400 mmWC spec ref: TCI:162/ 00, Applicable Quality Plan ref: CI:QA:1727:CQP:11/ 01 Applicable packing procedure ref:QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162/ 1727/ 00 S. nos: 24 to 47. Applicable Tag nos: HFC01CP001, HFC02CP001, HFC03CP001, HFC04CP001, HFC05CP001, HFC06CP001, HFC07CP001, HFC08CP001, HFW21CP001, HFW21CP002, HFW22CP001, HFW22CP002, HFW23CP001, HFW23CP002, HFW24CP001, HFW24CP002, HFW25CP001, HFW25CP002, HFW26CP001, HFW26CP002, HFW27CP001, HFW27CP002, HFW28CP001 & HFW28CP002	NO	24.00	PROJECT SITE BHUSAWAL	
7	L172719709701007	Differential Pressure Transmitter Range: 0 - 600 mmWC spec ref: TCI:162/ 00, Applicable Quality Plan ref: CI:QA:1727:CQP:11/ 01 Applicable packing procedure ref:QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162/ 1727/ 00 S. nos: 48 to 49. Applicable Tag nos: HFW20CP001 & HFW20CP002	NO	2.00	PROJECT SITE BHUSAWAL	
8	L172719709701008	Differential Pressure Transmitter Range: 0 - 1000 mmWC spec ref: TCI:162/ 00, Applicable Quality Plan ref: CI:QA:1727:CQP:11/ 01 Applicable packing procedure ref:QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162/ 1727/ 00 S. nos: 50 to 51. Applicable Tag nos: HHQ20CP002 & HHQ20CP003	NO	2.00	PROJECT SITE BHUSAWAL	

SL No.	MATLCD	DESCRIPTION	UOM	QTY	DELIVERY DESTINATION	QUOTED / NOT QUOTED
9	L172719709701009	Differential Pressure Transmitter Range: 0 - 1600 mmWC spec ref: TCI:162/ 00, Applicable Quality Plan ref: CI:QA:1727:CQP:11/ 01 Applicable packing procedure ref:QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162/ 1727/ 00 S. nos: 52 to 54. Applicable Tag nos: HBK10CP006, HBK10CP007 & HBK15CP006	NO	3.00	PROJECT SITE BHUSAWAL	
10	L1727S9709701001	Pressure Transmitter Range: (-)250 - 250 mmWC spec ref: TCI:162/ 00, Applicable Quality Plan ref: CI:QA:1727:CQP:11/ 01 Applicable packing procedure ref:QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162/ 1727-S 01 S. nos: 1	NO	2.00	BHEL STORES TRICHY	
11	L1727S9709701002	Pressure Transmitter Range: 0 - 10 Kg/ cm ² spec ref: TCI:162/ 00, Applicable Quality Plan ref: CI:QA:1727:CQP:11/ 01 Applicable packing procedure ref:QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162/ 1727-S 01 S. nos: 2	NO	2.00	BHEL STORES TRICHY	
12	L1727S9709701003	Pressure Transmitter Range: 0 - 30 Kg/ cm ² spec ref: TCI:162/ 00, Applicable Quality Plan ref: CI:QA:1727:CQP:11/ 01 Applicable packing procedure ref:QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162/ 1727-S 01 S. nos: 3	NO	2.00	BHEL STORES TRICHY	
13	L1727S9709701004	Diaphragm Seal type Pressure Transmitter with 5m armoured Capillary Range: 0 - 30 Kg/ cm ² spec ref: TCI:162/ 00, Applicable Quality Plan ref: CI:QA:1727:CQP:11/ 01 Applicable packing procedure ref:QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162/ 1727-S 01 S. nos: 4	NO	2.00	BHEL STORES TRICHY	
14	L1727S9709701005	Pressure Transmitter Range: 0 - 350 Kg/ cm ² spec ref: TCI:162/ 00, Applicable Quality Plan ref: CI:QA:1727:CQP:11/ 01 Applicable packing procedure ref:QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162/ 1727-S 01 S. nos: 5	NO	2.00	BHEL STORES TRICHY	
15	L1727S9709701006	Differential Pressure Transmitter Range: 0 - 400 mmWC spec ref: TCI:162/ 00, Applicable Quality Plan ref: CI:QA:1727:CQP:11/ 01 Applicable packing procedure ref:QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162/ 1727-S 01 S. nos: 6	NO	3.00	BHEL STORES TRICHY	
16	L1727S9709701007	Differential Pressure Transmitter Range: 0 - 600 mmWC spec ref: TCI:162/ 00, Applicable Quality Plan ref: CI:QA:1727:CQP:11/ 01 Applicable packing procedure ref:QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162/ 1727-S 01 S. nos: 7	NO	2.00	BHEL STORES TRICHY	
17	L1727S9709701008	Differential Pressure Transmitter Range: 0 - 1000 mmWC spec ref: TCI:162/ 00, Applicable Quality Plan ref: CI:QA:1727:CQP:11/ 01 Applicable packing procedure ref:QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162/ 1727-S 01 S. nos: 8	NO	2.00	BHEL STORES TRICHY	
18	L1727S9709701009	Differential Pressure Transmitter Range: 0 - 1600 mmWC spec ref: TCI:162/ 00, Applicable Quality Plan ref: CI:QA:1727:CQP:11/ 01 Applicable packing procedure ref:QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162/ 1727-S 01 S. nos: 9	NO	2.00	BHEL STORES TRICHY	
19	L17271SC30801009	Diaphragm Seal Type Pressure Transmitter with 5m Capillary Range: 0 - 40 Kg/ cm ² Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-PT/ 1727-SCR/ 00 S Nos: 30 to 35 Applicable Tag Nos: HSK30CP003, HSK30CP004, HSK31CP003, HSK31CP004, HSK40CP001 & HSK45CP001	NO	6.00	PROJECT SITE BHUSAWAL	

SL No.	MATLCD	DESCRIPTION	UOM	QTY	DELIVERY DESTINATION	QUOTED / NOT QUOTED
20	L17271SC30801010	DP Type Level Transmitter Range: 0 - 2.5 meters Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-PT/ 1727-SCR/ 00 SI Nos: 36 Applicable Tag Nos:HSL10CL001	NO	1.00	PROJECT SITE BHUSAWAL	
21	L17271SC30801014	DP Type Flow Transmitter Range: 0 - 100 mmWC Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-DPT/ 1727-SCR/ 00 SI Nos: 11 & 12 Applicable Tag Nos: HSF20CF001 & HSF30CF001	NO	2.00	PROJECT SITE BHUSAWAL	
22	L17271SC30801011	Differential Pressure Transmitter Range: 0 - 80 mmWC Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-DPT/ 1727-SCR/ 00 SI Nos: 1 to 6 Applicable Tag Nos: HSA11CP002, HSA11CP003, HSA11CP004, HSA21CP002, HSA21CP003 & HSA21CP004	NO	6.00	PROJECT SITE BHUSAWAL	
23	L17271SC30801012	Diaphragm Seal Type Differential Pressure Transmitter with 5m Capillary Range: 0 - 800 mmWC Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-DPT/ 1727-SCR/ 00 SI Nos: 7 & 8 Applicable Tag Nos: HSK30CP001 & HSK31CP001	NO	2.00	PROJECT SITE BHUSAWAL	
24	L17271SC30801013	Differential Pressure Transmitter Range: 0 - 1 Kg/ cm ² Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-DPT/ 1727-SCR/ 00 SI Nos: 9 & 10 Applicable Tag Nos: HSF20CP002 & HSF30CP002	NO	2.00	PROJECT SITE BHUSAWAL	
25	L17271SC30801001	Pressure Transmitter Range: (-)200 - 200 mmWC Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-PT/ 1727-SCR/ 00 SI Nos: 1 & 2 Applicable Tag Nos: HSA11CP001 & HSA21CP001	NO	2.00	PROJECT SITE BHUSAWAL	
26	L17271SC30801002	Pressure Transmitter Range: (-)500 - 500 mmWC Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-PT/ 1727-SCR/ 00 SI Nos: 3 & 4 Applicable Tag Nos: HSA11CP005 & HSA21CP005	NO	2.00	PROJECT SITE BHUSAWAL	
27	L17271SC30801003	Pressure Transmitter Range: 0 - 700 mmWC Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-PT/ 1727-SCR/ 00 SI Nos: 5 to 9 Applicable Tag Nos: HSG10CP001, HSG10CP002, HSG11CP001, HSG11CP002 & HSG12CP001	NO	5.00	PROJECT SITE BHUSAWAL	
28	L17271SC30801004	Pressure Transmitter Range: 0 - 10 Kg/ cm ² Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-PT/ 1727-SCR/ 00 SI Nos: 10 to 19 Applicable Tag Nos: HSF20CP001, HSF21CP001, HSF22CP001, HSF23CP001, HSF25CP001, HSF30CP001, HSF31CP001, HSF32CP001, HSF33CP001 & HSF35CP001	NO	10.00	PROJECT SITE BHUSAWAL	

SL No.	MATLCD	DESCRIPTION	UOM	QTY	DELIVERY DESTINATION	QUOTED / NOT QUOTED
29	L17271SC30801005	Diaphragm Seal Type Pressure Transmitter with 5m Capillary Range: 0 - 16 Kg/ cm ² Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-PT/ 1727-SCR/ 00 S Nos: 20 Applicable Tag Nos: HSL20CP001	NO	1.00	PROJECT SITE BHUSAWAL	
30	L17271SC30801006	Pressure Transmitter Range: 0 - 16 Kg/ cm ² Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-PT/ 1727-SCR/ 00 S Nos: 21 Applicable Tag Nos: HSQ20CP001	NO	1.00	PROJECT SITE BHUSAWAL	
31	L17271SC30801007	Diaphragm Seal Type Pressure Transmitter with 5m Capillary Range: 0 - 25 Kg/ cm ² Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-PT/ 1727-SCR/ 00 S Nos: 22 to 25 Applicable Tag Nos: HSJ15CP001, HSJ15CP002, HSJ16CP001 & HSJ16CP002	NO	4.00	PROJECT SITE BHUSAWAL	
32	L17271SC30801008	Diaphragm Seal Type Pressure Transmitter with 5m Capillary Range: 0 - 30 Kg/ cm ² Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-PT/ 1727-SCR/ 00 S Nos: 26 to 29 Applicable Tag Nos: HSJ20CP001, HSJ21CP001, HSK30CP002 & HSK31CP002	NO	4.00	PROJECT SITE BHUSAWAL	
33	L17271SC30801015	Diaphragm Seal DP Type Level Transmitter with 15m Capillary Range: 0 - 3.3 meters Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-DPT/ 1727-SCR/ 00 S Nos: 13 & 14 Applicable Tag Nos: HSJ20CL002 & HSJ21CL002	NO	2.00	PROJECT SITE BHUSAWAL	
34	L17271SC30801016	Ultrasonic Type Level Transmitters Range: 0 - 3 meters Spec ref.: TCI:1727-SCR/ ULT/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Applicable Tag No: HSL20CL001	NO	1.00	PROJECT SITE BHUSAWAL	
35	L1727SSC30801001	Pressure Transmitter Range: (-)200 - 200 mmWC Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-PT/ 1727-SCR-S' 00 S Nos: 1	NO	2.00	BHEL STORES TRICHY	
36	L1727SSC30801002	Pressure Transmitter Range: (-)500 - 500 mmWC Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-PT/ 1727-SCR-S' 00 S Nos: 2	NO	2.00	BHEL STORES TRICHY	
37	L1727SSC30801003	Pressure Transmitter Range: 0 - 700 mmWC Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-PT/ 1727-SCR-S' 00 S Nos: 3	NO	2.00	BHEL STORES TRICHY	
38	L1727SSC30801004	Pressure Transmitter Range: 0 - 10 Kg/ cm ² Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-PT/ 1727-SCR-S' 00 S Nos: 4	NO	2.00	BHEL STORES TRICHY	
39	L1727SSC30801005	Diaphragm Seal Type Pressure Transmitter with 5m Capillary Range: 0 - 16 Kg/ cm ² Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-PT/ 1727-SCR-S' 00 S Nos: 5	NO	2.00	BHEL STORES TRICHY	

SL No.	MATLCD	DESCRIPTION	UOM	QTY	DELIVERY DESTINATION	QUOTED / NOT QUOTED
40	L1727SSC30801006	Pressure Transmitter Range: 0 - 16 Kg/ cm ² Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-PT/ 1727-SCR-S' 00 S Nos: 6	NO	2.00	BHEL STORES TRICHY	
41	L1727SSC30801007	Diaphragm Seal Type Pressure Transmitter with 5m Capillary Range: 0 - 25 Kg/ cm ² Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-PT/ 1727-SCR-S' 00 S Nos: 7	NO	2.00	BHEL STORES TRICHY	
42	L1727SSC30801008	Diaphragm Seal Type Pressure Transmitter with 5m Capillary Range: 0 - 30 Kg/ cm ² Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-PT/ 1727-SCR-S' 00 S Nos: 8	NO	2.00	BHEL STORES TRICHY	
43	L1727SSC30801009	Diaphragm Seal Type Pressure Transmitter with 5m Capillary Range: 0 - 40 Kg/ cm ² Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-PT/ 1727-SCR-S' 00 S Nos: 9	NO	2.00	BHEL STORES TRICHY	
44	L1727SSC30801010	DP Type Level Transmitter Range: 0 - 2.5 meters Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-PT/ 1727-SCR-S' 00 S Nos: 10	NO	2.00	BHEL STORES TRICHY	
45	L1727SSC30801011	Differential Pressure Transmitter Range: 0 - 80 mmWC Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-DPT/ 1727-SCR-S' 00 S Nos: 1	NO	2.00	BHEL STORES TRICHY	
46	L1727SSC30801012	Diaphragm Seal Type Differential Pressure Transmitter with 5m Capillary Range: 0 - 800 mmWC Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-DPT/ 1727-SCR-S' 00 S Nos: 2	NO	2.00	BHEL STORES TRICHY	
47	L1727SSC30801013	Differential Pressure Transmitter Range: 0 - 1 Kg/ cm ² Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-DPT/ 1727-SCR-S' 00 S Nos: 3	NO	2.00	BHEL STORES TRICHY	
48	L1727SSC30801014	DP Type Flow Transmitter Range: 0 - 100 mmWC Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-DPT/ 1727-SCR-S' 00 S Nos: 4	NO	2.00	BHEL STORES TRICHY	
49	L1727SSC30801015	Diaphragm Seal DP Type Level Transmitter with 15m Capillary Range: 0 - 3.3 meters Spec ref.: TCI:1727-SCR/ 162/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Datasheet ref: DSH:162-DPT/ 1727-SCR-S' 00 S Nos: 5	NO	2.00	BHEL STORES TRICHY	
50	L1727SSC30801016	Ultrasonic Type Level Transmitters Range: 0 - 3 meters Spec ref.: TCI:1727-SCR/ ULT/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03	NO	1.00	BHEL STORES TRICHY	
				155.00		

NOTE: It is mandatory to quote for all the above items. The delivery location is mentioned. The items shall be despatched as per the delivery destination & schedule.

PACKAGE DETAILS						
PACKAGE-2						
SL No.	MATLCD	DESCRIPTION	UOM	QTY	DELIVERY DESTINATION	QUOTED / NOT QUOTED
34	L17271SC30801016	Ultrasonic Type Level Transmitters Range: 0 - 3 meters Spec ref.: TCI:1727-SCR/ ULT/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03 Applicable Tag No: HSL20CL001	NO	1.00	PROJECT SITE BHUSAWAL	
50	L1727SSC30801016	Ultrasonic Type Level Transmitters Range: 0 - 3 meters Spec ref.: TCI:1727-SCR/ ULT/ 00 QP ref.: CI:QA:1727:CQP:11/ 01 Packing Procedure ref: QA:CI:STD:PR:04/ 03	NO	1.00	BHEL STORES TRICHY	
				2.00		

NOTE: It is mandatory to quote for all the above items. The delivery location is mentioned. The items shall be despatched as per the Delivery destination & schedule.

	CONTROLS & INSTRUMENTATION (FB) PRE-QUALIFICATION REQUIREMENT (PQR)	CI:PE:PQR: XTR Rev. No: 00 Dt. : 07-07-2021
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Pressure & Differential Pressure Transmitters

Sl. No.	Description	Bid Requirements
1.	Vendor Capability	Vendor shall be the Original Equipment Manufacturer (OEM) of Pressure & Differential Pressure Transmitters.
2.	Proven Track record	The offered Pressure & Differential Pressure Transmitter models, should be of proven design, already supplied to power plants in India and the same shall be working satisfactorily for a period of minimum 2 years as on the date of techno-commercial bid opening.
3.	Past experience /Reference Projects	• Vendor to submit signed copy of the reference list of projects, where the offered Pressure & Differential Pressure Transmitters, was supplied earlier in the past five years. The reference list should contain the following details, Name of the projects, Customer, Capacity of the plant, location, model number of the transmitter, application, year of commissioning and contact details along with relevant PO copies. • Vendor shall submit the performance Certificates from End User/ Principal Contractor (if the supplies were through agencies other than BHEL).
4.	Service & Spares support	Spares & service support shall be available in India.



BHARAT HEAVY ELECTRICALS LIMITED

HIGH PRESSURE BOILER PLANT, TIRUCHIRAPALLI -620014

TECHNICAL DELIVERY CONDITIONS FOR SUB DELIVERY COMPONENTS OF CONTROLS AND INSTRUMENTATION - PE / FB

TDC:TCI:162/REV 0

Page: 01 of 04

PRESSURE / DIFFERENTIAL PRESSURE TRANSMITTER

REVISION HISTORY

0	31-03-2018	Initial Release	 (AB)	 (NR)	 (VA)	 (TK)
Rev. No.	DATE	DESCRIPTION	PREPARED	Engg.	QAC	APPROVED
				REVIEWED		

CL No.	CHARACTERISTICS	REQUIREMENT	Vendor compliance
1.0	<u>SITE CONDITIONS</u>		
1.1	Altitude above mean sea level	} Refer Data sheet	
1.2	Design ambient temperature range		
1.3	Relative humidity		
1.4	Atmosphere	Tropical, Dusty, salty, corrosive and highly polluted.	
2.0	<u>PROCESS CONDITIONS</u>		
2.1	Instrument Tag no	} Refer Data sheet	
2.2	Application		
2.3	Process Medium		
2.4	Operating Pressure / Differential Pressure		
2.5	Operating temperature		
2.6	Calibration range		
3.0	<u>SENSOR MODULE</u>		
3.1	Working principle	Capacitance / Piezoelectric / Piezoresistive / Silicon resonance/ Digital Inductance	
3.2	Over pressure	150 % of max. operating pressure. For vacuum service, the element shall have under - range protection to full vacuum	
3.3	Proof Pressure	Shall be 200% of maximum static process pressure	
3.4	Process Isolation Diaphragm	SS 316 / Hastelloy C -276	
3.5	Filling fluid	Silicone Oil	
3.6	Sensor Module Housing, Vent and Drain Plug	SS 316	
3.7	Process connection	1/2" NPT (F)	
4.0	<u>ELECTRONICS MODULE</u>		
4.1	Type	Smart 2 wire type, HART protocol compatible.	
4.2	Power supply	24 V DC $\pm$ 10 %	
4.3	Load impedance	500 ohms minimum at 24V DC	
4.4	Diagnostics	Self indicating feature.	
4.5	Adjustment / calibration / maintenance	Port/provision for centralised PC based system / Hand Held Communicator maintenance.	
4.6	Display	Digital LCD Integral Display (minimum 4 digit) with integral keypad, access protected by user code	

CL No.	CHARACTERISTICS	REQUIREMENT	Vendor compliance
4.7	Electrical connection	Refer data sheet note	
4.8	Electronics Housing	Die cast aluminium with durable corrosion resistant coating	
5.0	<u>PERFORMANCE REQUIREMENTS</u>		
5.1	Output Signal Range	4 - 20 mA dc (Analog) along with superimposed digital signal on HART protocol.	
5.2	Turn down ratio	10:1 for vacuum/very low pressure applications. 30:1 for other applications	
5.3	Stability	± 0.1 % of calibrated span for 6 months for range up to 70 kg/cm ² ± 0.25 % of calibrated span for 6 months for range above 70 kg/cm ²	
5.4	Span and Zero adjustability	Continuous tamper proof, remote as well as manual from instrument with zero suppression and elevation facility.	
5.5	Zero and Span drift	± 0.015% per °C at max span & 0.11% per °C at min. span.	
5.6	Response Time (Response Time = Dead Time + Time constant)	270 ms or less for draft & vacuum application 150 ms or less for other application 2 sec. for remote diaphragm seal application	
5.7	Accuracy (includes repeatability, linearity & Hysteresis)	± 0.1 % of span or better	
6.0	<u>GENERAL</u>		
6.1	Enclosure protection	Weather proof IP65 as per IEC - 60529 with corrosion resistance coating.	
6.2	Identification	Separate SS tag plate with Tag No. and service legend engraved.	
7.0	<u>ACCESSORIES</u>		
7.1	Diaphragm Seal for HFO Applications	SS 316 remote diaphragm seal and 8 mtr length of SS 316 capillary tubes with SS304 armouring and PVC protective coating. Necessary 1" ANSI 300 RF SS 316 flanges & fasteners with gasket . End connection of the flange shall be 1/2" NPT(F)	
7.2	Mounting	Mounting bracket, U clamp for 2" pipe mounting and fasteners.	

CL No.	CHARACTERISTICS	REQUIREMENT	Vendor compliance
7.3	Valve manifold	a) 2 Valve Manifold for Pressure Transmitter b) 3 Valve Manifold for DP Transmitter for Air & Flue gas application. c) 5 Valve manifold for DP Transmitter in steam, water & light oil application.	
8.0	<u>INSPECTION & TESTING</u>	As per quality plan QA:CI:STD:QP:06 (Latest Revision)	
9.0	<u>DOCUMENTS</u>		
9.1	To be submitted along with offer	1. Technical catalogue, Clause wise compliance, deviation list to specification.	
		2. Data Sheet with model, span and accuracy for calibrated range.	
9.2	To be submitted during inspection	1. T.R for routine test for each Transmitter.	
		2. T.C. for type test	
		3. Guarantee certificate	
		4. Approved datasheet & drawing	
9.3	To be submitted after inspection	2 sets of Original & 1 CD of Instruction / Operation & Maintenance Manual, Technical Catalogues	
10.0	<u>PACKING</u>	As per packing procedure QA:CI:STD:PR:04 (Latest Revision)	

NOTE:

1. Refer Purchase Order for revision status of Quality Plan, Drawing No & Packing Procedure.
2. In 'Vendor compliance' column - vendor shall indicate 'YES', 'NO' or 'NOT APPLICABLE'.
3. Vendor shall submit legible copy of datasheet & drawing in pdf format.
4. The entire system and accessories should not contain any asbestos material.



DEVELOPMENT CONSULTANT PVT. LTD.

Reviewed only for general conformance with contract drawings and specifications;
Contractor to be responsible for any error and for fulfilment of details requirements of contract documents.

CODE:- 1 DATE:- 03-05-2021

DISTRIBUTED BY:- YUGANT

1	Approved	4	For information only
2	Approved Subject to compliance to comments, Proceed with manufacturing/construction. Revised document required to be submitted after incorporating the comments.	V	Null and Void (Not applicable)
3	Not Approved. Resubmission required		

SEE COVERING LETTER

LETTER REF.NO.:- 18V06-I01-LOT-BHEL-0213

CONTROLS AND INSTRUMENTATION/QA/FB

BHUSAWAL TPP – 1 X 660MW
MAHARASHTRA STATE POWER GENERATION CO. LTD.

CONTRACT QUALITY PLAN FOR
TRANSMITTERS (ELECTRONIC)

REV	DATE	PREPARED	REVIEWED	APPROVED	REVISION HISTORY
00	10/03/2021	Sd/-	Sd/-	Sd/-	Initial release.
01	29/04/21	B ARUNKUMAR <i>B. Arunkumar</i>	G V CHILAMBARASAN <i>G. V. Chilambarasan</i>	B MUTHUKUMARAN <i>B. Muthukumar</i>	Revised based on customer comments.



BHARAT HEAVY ELECTRICALS LIMITED
TIRUCHIRAPPALLI - 620014

QUALITY PLAN FOR
TRANSMITTERS (ELECTRONIC)

CI:QA:1727:CQP:11

Rev: 01

Page: 2 of 3

Sl. No	Component & Operation	Characteristics	Class	Type of Check	Quantum of check		Ref Doc. & Acceptance STD	Format of record	AGENCY			Remarks
					M	B/C			M	B	C	
A	FINISHED PRODUCT INSPECTION											
01	Routine test	a. Make, model, tag, range, Physical, dimensional	Major	VISU MEAS	100%	20%	PO, Spec, IEC 60770	TR	P	W	W	
		b. Sensor type and material of wetted parts.	Major	PHYS/CHEM	One of Design	One of Design	-Do-	TC	P	V	V	
		c. Electrical and Process connection	Critical	PHYS	100%	20%	-Do-	TR	P	W	W	
		d. Over range protection test	Critical	MECH	100%	20%	-Do-	TR	P	W	W	
		e. Power supply variation test	Critical	ELEC	100%	20%	-Do-	TR	P	W	W	
		f. HV/IR test at 500 V for 1 minute. IR shall be > 10 meg ohm.	Major	ELEC	100%	20%	-Do-	TR	P	W	W	
		g. Accuracy and calibration (Linearity) test	Major	ELEC	100%	20%	-Do-	TR	P	W	W	
		h. Accessories	Major	PHYS	100%	20%	PO, Spec,	TR	P	W	W	
		i. Painting	Major	VISU	100%	20%	PO, Spec,	TR	P	W	W	
02	Type tests	a. Hysteresis	Major	ELEC	One of Design	One of Design	PO, Spec, Mfr std, IEC 60770	TC	P	V	V	
		b. Repeatability	Major	ELEC	-Do-	-Do-	-Do-	TC	P	V	V	
		c. Dead band test / sensitivity	Major	ELEC	-Do-	-Do-	-Do-	TC	P	V	V	
		d. Humidity Test	Major	ENVI	-Do-	-Do-	-Do--	TC	P	V	V	
		e. Mounting position test	Major	PHYS	-Do-	-Do-	-Do-	TC	P	V	V	
		f. Long term drift	Critical	ELEC	-Do-	-Do-	-Do-	TC	P	V	V	
		g. Power supply interruption test	Major	ELEC	-Do-	-Do-	-Do-	TC	P	V	V	
		h. Electrical interference test (common mode & series mode)	Major	ELEC	-Do-	-Do-	-Do-	TC	P	V	V	
		i. Output load test	Major	ELEC	-Do-	-Do-	-Do-	TC	P	V	V	
		j. Magnetic field interference test	Major	ELEC	-Do-	-Do-	-Do-	TC	P	V	V	
		k. Enclosure protection test	Major	ENVI	-Do-	-Do-	PO, Spec, IS 60529	TC	P	V	V	

M- MANUFACTURER/ SUB-VENDOR; **B** - BHEL / TPI ; **C** – CUSTOMER (MAHAGENCO) / TPI
P - PERFORM; **W** - WITNESS **V** - VERIFICATION;



B.NOTES:

1.LEGENDS:

ENVI	:	Environmental	MEAS	:	Measurement
MECH	:	Mechanical	VISU	:	Visual
ELEC	:	Electrical	PHYS	:	Physical
TC	:	Test certificate	TR	:	Test Report

- The vendor at their works shall arrange all testing facilities. Tests for which facilities are not available are to be carried out at recognized National Test Houses like ETDC/CIL/NPL/ERTL etc., at vendor cost.
- Through Log Book / any other documents available at the vendor's works, it shall be possible to correlate the finished product with inspection carried out.
- All Measuring and Testing Instruments shall be periodically calibrated from recognized test houses & certificates made available during inspection for verification.
- Test certificates for type tests are to be furnished by the vendor.
- Type test certificate shall not be earlier than 5 years from the date of Purchase enquiry.
- Vendor to give tentative inspection program in advance and confirm exact date two weeks in advance for arranging BHEL's inspection.
- Vendor shall follow transit worthy packing to ensure receipt of material at destination and to withstand multiple handling.

C. REFERENCE STANDARDS:

(For Indicated Standards Refer the Latest Version)

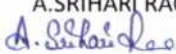
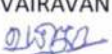
- | | | |
|-----------|---|--|
| IEC 60770 | : | Methods of evaluating the performance of transmitters for use of in industrial process control system. |
| IS 60529 | : | Specification for Degrees of protection provided by enclosures. |

CI:QA:1727:CQP:11

**BHARAT HEAVY ELECTRICALS LIMITED
TIRUCHIRAPPALLI**

**CONTROLS AND INSTRUMENTATION / FB
QUALITY ASSURANCE**

**STANDARD PACKING PROCEDURE
FOR
ALL INSTRUMENTS AND MISCELLENEOUS ITEMS
(ELECTRICAL, ELECTRONIC AND PNEUMATIC)**

Rev	Date	Prepared	Checked	Approved	Revision History
00	01.01.96	Sd/-	Sd/-	Sd/-	Initial History
01	28.03.02	Sd/-	Sd/-	Sd/-	Department name changed
02	26.02.07	Sd/-	Sd/-	Sd/-	Revised after discussion with Shipping Dept.
03	17.12.16	A.SRIHARI RAO 	RM.VAIRAVAN 	S.DAKSHINAMOORTHY 	Revised to suit all type of instruments.

1. Scope

This procedure gives minimum guidelines to be complied with for packing of Electrical, Electronic and pneumatic Instruments. This packing shall be suitable for different handling operations and for the adverse conditions during transportation and during indoor / outdoor storage for period more than one year.

2. Material for packing

The individual instrument shall be packed in carton box (specifically made for particular instrument) and grouped together inside a box made of wood or plywood as per National / International standard.

3. Packing

- Items shall be inspected for cleanliness immediately before packaging. Dirt, oil, residue, metal chips or other forms of contamination shall be removed.
- Adequate protection shall be provided against mechanical damage and atmospheric corrosion in transit and, for equipment suitable for outside storage, for prolonged storage at the site prior to installation.
- Water proof barrier material – high density polythene shall be used as a resistant to grease and water; it shall protect items from airborne and windblown soils.
- Desiccants like silica gel to be used inside the carton box. Silica gel shall conform to IS 3401. The gel is to be packed in sachets placed at different positions inside the components for absorbing moisture. The quantity of silica gel shall be adequate for storage period of one year.
- All tapped openings in equipment shall be plugged with plastic plugs to protect internal / external threads.
- Use a sturdy cardboard shipping carton, large enough for at least 3 inch foam padding around the instrument.
- Do not use loose plastic foam pieces, which can shift during transport.
- Secure the box flaps with packaging tape or box staples.

3.1) Marking & Labelling:

- Components and their containers shall be identified by marking. Shipping marks shall be on all sides of package. The shipping marks shall be at least 3 inches high where space permits. Markings are to be in black paint or ink depending on shade of the package surface.
- Cautionary symbols to be stenciled in red waterproof paint or ink.

QA:CI:STD:PR:04 / Rev 03

- The gap between job and the box shall be filled with suitable material like jute, coir, thermo coal, etc.
- For export packing additional care shall be taken as per contract requirements if applicable. Otherwise, suitable box made of seasoned wood and / or plywood sheets of required thickness shall be used with suitable sea worthy packing protection.

4. Marking

- After completing the packing, Stencil marking, as per dispatch instructions and symbol marking as per Annexure – I shall be made. Please ensure the box is stenciled with “FRAGILE ITEM”, “HANDLE WITH CARE”.

5. Packing Slip

- A copy of the packing slip, kept in a polythene cover shall be kept inside the box. Another copy of the packing slip, kept in a polythene cover shall be kept outside the box and firmly fixed to the case.

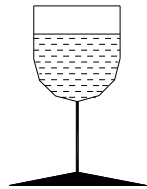
6. Caution

- Do not pack any other Mechanical items with this case.

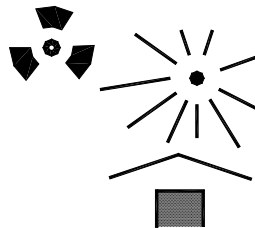
7. General

- These packing procedures are the minimum requirements in addition to the standard instructions mentioned in the Purchase Order and Specification.
- Deviation to meet the packing procedure requirements / non-clarity in packing approach in any quotation will be liable for rejection of offer.

ANNEXURE – 1



FRAGILE, HANDLE WITH CARE



PROTECT FROM HEAT AND RADIOACTIVE SOURCES



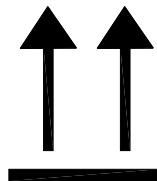
USE NO HOOKS

NOTE: The design of heavy goods packages cannot always resist top lifting by grabhooks.



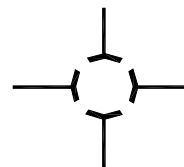
KEEP DRY

NOTE: Not all cases have waterproof internal liners: plywood used in the construction may not have a waterproof glue line.



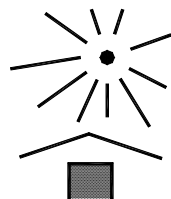
THIS WAY UP

NOTE: Certain designs of small cases make it difficult to distinguish top from bottom.

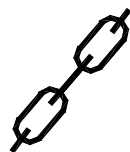


CENTRE OF GRAVITY

NOTE: This should be stencilled as a minimum on the two longest case sides (this information will normally be supplied by the manufacturer of the item(s) packed).

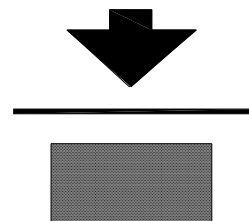


KEEP AWAY FROM HEAT



INTERNATIONAL "SLING HERE" SYMBOL

... kg max



STACKING LIMITATION

NOTE: The maximum load in kilograms should be marked above the arrow.

BHARAT HEAVY ELECTRICALS LIMITED

HIGH PRESSURE BOILER PLANT, TIRUCHIRAPALLI – 620 014

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



TCI:1727-SCR/162

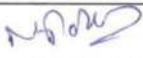
PAGE 1 OF 3

PRESSURE / DIFFERENTIAL PRESSURE TRANSMITTER

for

Project: Bhusawal, 1 x 660 MW
Customer Nos.: 1727

REVISION HISTORY

REV. No.	DATE	DESCRIPTION	PREPARED	CHECKED	APPROVED
00	17-06-2021	Initial Release	 (N.Rakesh)	 (N.Rakesh)	 (Aswini Kumar Panda)

Cl No.	Characteristics	Requirement
1.0	Site Conditions	
1.1	Altitude above mean sea level	Refer Datasheet
1.2	Ambient temperature condition	
1.3	Relative humidity	
1.4	Atmosphere	Tropical, Dusty, salty, corrosive and highly polluted.
2.0	Process conditions	
2.1	Instrument Tag no	Refer Datasheet
2.2	Process Medium	
2.3	Operating Pressure / Differential Pressure	
2.4	Operating temperature	
2.5	Calibration range	
3.0	Sensor elements	
3.1	Over pressure	150 % of max operating pressure.
3.2	Process Isolating Diaphragm	SS 316
3.3	Sensor Module Housing, Vent and Drain Plug	SS 316
3.4	Process connection	½" NPT(F)
4.0	Electronics module	
4.1	Type	Microprocessor based, 2 wire type, HART protocol compatible. No Retrofit models acceptable.
4.2	Power supply	24V DC $\pm 10\%$
4.3	Load impedance	600 ohms minimum at 24V DC
4.4	Diagnostics	Self-indicating feature.
4.5	Adjustment /calibration / maintenance	Centralised PC based system/ Hand Held Communicator
4.6	Display	Digital LCD Integral Display with engineering unit
4.7	Electrical connection	Cable Gland
4.8	Electronics Housing	Metallic Housing with durable corrosion resistant coating
5.0	Performance requirements	
5.1	Output Signal Range	4 - 20 mA DC (Analog) along with superimposed digital signal on HART protocol.
5.2	Turn down ratio	100:1
5.3	Stability	$\pm 0.1\%$ of calibrated span for 6 months for range up to 70 kg/cm ² $\pm 0.25\%$ of calibrated span for 6 months for range above 70 kg/cm ²



5.4	Span and Zero adjustability	Locally adjustable non interacting facility for elevation and suppression by 100% of span
5.5	Response Time (Response Time = Dead Time + Time constant)	150 millisecond or less
5.6	Accuracy (includes Repeatability, Linearity and Hysteresis)	± 0.1 % of span or better
6.0	General	
6.1	Enclosure protection	Air/Water/Flue Gas Medium - Weather proof as per IP65 Ammonia Medium – Refer Datasheet
6.2	Name Plate	SS 316 - Instrument Tag Number shall be engraved.
7.0	Accessories	
7.1	Mounting accessories	Mounting bracket, U clamp for 2" pipe mounting and fasteners.
7.2	Valve manifolds	1. Two Valve Manifold for Absolute & Gauge Pressure Applications. 2. Three Valve & Five Valve manifold for DP/Level/Flow applications. 3. Valve Manifold shall be non-integral type 4. Manifold Material: SS316
8.0	Inspection & testing	CI:QA:1727:CQP:11/01
9.0	Documents	
9.1	To be submitted along with offer in 2 sets.	1.Catalogues. 2.Filled in data sheets
9.2	To be submitted during inspection	1. T.C. for routine test for each transmitter. 2. T.C. for type test 3. Material certificate 4. Guarantee certificate 5. Calibration certificate
9.3	To be submitted after inspection: 2 sets of Original & 1 CD.	1. Catalogues 2. O & M manuals
10.0	Packing	QA:CI:STD:PR:04/03

NOTE:

1. In Vendor Compliance column - vendor shall indicate 'YES', 'NO' or 'NOT APPLICABLE'.
2. The entire system and accessories should not contain any asbestos material.

BHARAT HEAVY ELECTRICALS LIMITED

HIGH PRESSURE BOILER PLANT, TIRUCHIRAPALLI – 620 014

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



TCI:1727-SCR/ULT

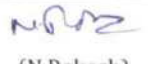
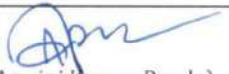
PAGE 1 OF 3

ULTRASONIC TYPE LEVEL TRANSMITTER

for

Project: Bhusawal, 1 x 660 MW
Customer Nos.: 1727

REVISION HISTORY

REV. No.	DATE	DESCRIPTION	PREPARED	CHECKED	APPROVED
00	17-06-2021	Initial Release	 (N.Rakesh)	 (N.Rakesh)	 (Aswini Kumar Panda)

CL. NO.	CHARACTERISTICS	REQUIREMENT
1.0	Site Conditions	
1.1	Altitude above mean sea level	316 m above MSL
1.2	Design ambient temperature range	13 - 14 °C
1.3	Relative humidity	73%
2.0	Process Conditions	
2.1	Instrument Tag no	HSL20CL001
2.2	Process Medium	Aqueous Ammonia
2.3	Operating Pressure	Atmospheric Pressure
2.4	Operating temperature	27 °C
2.5	Calibration range	0 - 3 m
2.6	Process connection	3" #150 A105 Flanged
3.0	Transmitter Features	
3.1	Type of Transmitter	Microprocessor based, 2 wire type, HART protocol compatible. No Retrofit models acceptable.
3.2	Working principle	Detection of reflected ultrasonic pulse, HART protocol
3.3	Output Signal Range	4 - 20 mA dc (Analog) along with superimposed digital signal on HART protocol.
3.4	Sensor material	Body - PVC or better Sensor - Polyurethane or better
3.5	Display	Large Alpha-numeric back lit LCD/LED display
3.6	Electrical connection	Cable gland
3.7	Power supply	24VDC $\pm$ 10%
4.0	Performance Characteristics	
4.1	Accuracy	0.25% of span or better
4.2	Resolution	$\pm$ 0.1 % of span
4.3	Load impedance	600 ohms minimum at 24V DC
4.4	Diagnostics	On-line
4.5	Adjustment /calibration / maintenance	Accessible from front panel
5.0	General	
5.1	Enclosure protection	Explosion Proof (Gas group: NFPA 70 Class 1, Div. 1, Group D) or equivalent with PESO Certification.
5.2	Mounting	Flanged connection at top of tank covers
5.3	Name Plate	SS 316 - Instrument Tag Number shall be engraved.
6.0	Accessories	

6.1	Canopies	Weather canopies for protection from direct sunlight and direct rain.
6.2	Mounting hardware	3" #150 Instrument Flange, Counter Flange, Flange Gaskets, Bolts & Nuts of CS material
7.0	Inspection & testing	CI:QA:1727:CQP:11/01
8.0	Documents	
8.1	To be submitted along with offer in 2 sets.	1. Catalogues. 2. Filled in data sheets
8.2	To be submitted during inspection	1. T.C. for routine test 2. T.C. for type test 3. Material certificate 4. Guarantee certificate 5. Calibration certificate
8.3	To be submitted after inspection: 2 sets of Original & 1 CD.	1. Catalogues 2. O & M manuals
9.0	Packing	QA:CI:STD:PR:04/03

NOTE:

1. In Vendor Compliance column - vendor shall indicate 'YES', 'NO' or 'NOT APPLICABLE'.
2. The entire system and accessories should not contain any asbestos material.

a Site Conditions:												
i	Altitude above mean sea level			126 m above FGL of the Plant								
ii	Ambient temperature condition			4 to 44 °C								
iii	Relative humidity			28 - 84 %								
b Technical Data:												
Sl no	Instrument Tag	Description	Medium	Qty/ Blr	Op. Press.	Max. Press.	Unit of Pressure	Op. Temp. (°C)	Max. Temp. (°C)	Op. DP	Max. DP	Calibration Range
Pressure Transmitters												
1	HBK10CP002	FURNACE PRESSURE - LEFT	FLUE GAS	1	-3	-4	mmWC	1170	1300	--	--	(-)250 - 250
2	HBK15CP001	FURNACE PRESSURE - RIGHT	FLUE GAS	1	-3	-4	mmWC	1170	1300	--	--	(-)250 - 250
3	HBK15CP002	FURNACE PRESSURE - RIGHT	FLUE GAS	1	-3	-4	mmWC	1170	1300	--	--	(-)250 - 250
4	HJM01CP003	ATOMISING STEAM HEADER PRESSURE	ATM. STEAM	1	7.5	--	kg/cm ²	290	--	--	--	0 - 10
5	HJM01CP004	ATOMISING STEAM HEADER PRESSURE	ATM. STEAM	1	7.5	--	kg/cm ²	290	--	--	--	0 - 10
6	HJM01CP005	ATOMISING STEAM HEADER PRESSURE	ATM. STEAM	1	7.5	--	kg/cm ²	290	--	--	--	0 - 10
7	HJN01CP001	ATOMISING AIR HEADER PRESSURE	ATOM. AIR	1	6	--	kg/cm ²	35	--	--	--	0 - 10
8	HJN01CP002	ATOMISING AIR HEADER PRESSURE	ATOM. AIR	1	6	--	kg/cm ²	35	--	--	--	0 - 10
9	HJN01CP003	ATOMISING AIR HEADER PRESSURE	ATOM. AIR	1	6	--	kg/cm ²	35	--	--	--	0 - 10
10	HJF51CP001	PRESSURE BEFORE LOTV	LDO	1	19.7	--	kg/cm ²	40	--	--	--	0 - 30
11	HJF51CP005	LDO HEADER PRESSURE	LDO	1	4.2 - 15	--	kg/cm ²	40	--	--	--	0 - 30
12	HJF51CP006	LDO HEADER PRESSURE	LDO	1	4.2 - 15	--	kg/cm ²	40	--	--	--	0 - 30
13	HJF51CP007	LDO HEADER PRESSURE	LDO	1	4.2 - 15	--	kg/cm ²	40	--	--	--	0 - 30
14	HJF59CP003	PRESSURE BEFORE OP. FLOOR STRAINER	HFO	1	22.2	--	kg/cm ²	120	--	--	--	0 - 30
15	HJF59CP007	HFO HEADER PRESSURE	HFO	1	5.9	17.90	kg/cm ²	120	--	--	--	0 - 30

Sl no	Instrument Tag	Description	Medium	Qty/ Blr	Op. Press.	Max. Press.	Unit of Pressure	Op. Temp. (°C)	Max. Temp. (°C)	Op. DP	Max. DP	Calibration Range
16	HJF59CP008	HFO HEADER PRESSURE	HFO	1	5.9	17.90	kg/cm ²	120	--	--	--	0 - 30
17	HJF59CP009	HFO HEADER PRESSURE	HFO	1	5.9	17.90	kg/cm ²	120	--	--	--	0 - 30
18	LBA11CP011	MAIN STEAM LINE PRESSURE -LEFT	STEAM	1	255	277.5	kg/cm ²	596	--	--	--	0 - 350
19	LBA11CP012	MAIN STEAM LINE PRESSURE -LEFT	STEAM	1	255	277.5	kg/cm ²	596	--	--	--	0 - 350
20	LBA11CP013	MAIN STEAM LINE PRESSURE -LEFT	STEAM	1	255	277.5	kg/cm ²	596	--	--	--	0 - 350
21	LBA12CP011	MAIN STEAM LINE PRESSURE -RIGHT	STEAM	1	255	277.5	kg/cm ²	596	--	--	--	0 - 350
22	LBA12CP012	MAIN STEAM LINE PRESSURE -RIGHT	STEAM	1	255	277.5	kg/cm ²	596	--	--	--	0 - 350
23	LBA12CP013	MAIN STEAM LINE PRESSURE -RIGHT	STEAM	1	255	277.5	kg/cm ²	596	--	--	--	0 - 350
Differential Pressure Transmitters												
24	HFC01CP001	MILL A BOWL DIFF. PRESSURE	COAL + AIR	1	793 / 339	1009 / 443	mmWC	253 / 90	317 / 100	DP<225	--	0 - 400
25	HFC02CP001	MILL B BOWL DIFF. PRESSURE	COAL + AIR	1	793 / 339	1009 / 443	mmWC	253 / 90	317 / 100	DP<225	--	0 - 400
26	HFC03CP001	MILL C BOWL DIFF. PRESSURE	COAL + AIR	1	793 / 339	1009 / 443	mmWC	253 / 90	317 / 100	DP<225	--	0 - 400
27	HFC04CP001	MILL D BOWL DIFF. PRESSURE	COAL + AIR	1	793 / 339	1009 / 443	mmWC	253 / 90	317 / 100	DP<225	--	0 - 400
28	HFC05CP001	MILL E BOWL DIFF. PRESSURE	COAL + AIR	1	793 / 339	1009 / 443	mmWC	253 / 90	317 / 100	DP<225	--	0 - 400
29	HFC06CP001	MILL F BOWL DIFF. PRESSURE	COAL + AIR	1	793 / 339	1009 / 443	mmWC	253 / 90	317 / 100	DP<225	--	0 - 400
30	HFC07CP001	MILL G BOWL DIFF. PRESSURE	COAL + AIR	1	793 / 339	1009 / 443	mmWC	253 / 90	317 / 100	DP<225	--	0 - 400
31	HFC08CP001	MILL H BOWL DIFF. PRESSURE	COAL + AIR	1	793 / 339	1009 / 443	mmWC	253 / 90	317 / 100	DP<225	--	0 - 400
32	HF21CP001	SEAL AIR TO UNDER BOWL DIFF. PRESSURE MILL A	SEAL AIR	1	1057 / 793	1162 / 1009	mmWC	--	50/331	DP>203	--	0 - 400



Sl no	Instrument Tag	Description	Medium	Qty/ Blr	Op. Press.	Max. Press.	Unit of Pressure	Op. Temp. (°C)	Max. Temp. (°C)	Op. DP	Max. DP	Calibration Range
33	HFW21CP002	SEAL AIR TO UNDER BOWL DIFF. PRESSURE MILL A	SEAL AIR	1	1057 / 793	1162 / 1009	mmWC	--	50/331	DP>203	--	0 - 400
34	HFW22CP001	SEAL AIR TO UNDER BOWL DIFF. PRESSURE MILL B	SEAL AIR	1	1057 / 793	1162 / 1009	mmWC	--	50/331	DP>203	--	0 - 400
35	HFW22CP002	SEAL AIR TO UNDER BOWL DIFF. PRESSURE MILL B	SEAL AIR	1	1057 / 793	1162 / 1009	mmWC	--	50/331	DP>203	--	0 - 400
36	HFW23CP001	SEAL AIR TO UNDER BOWL DIFF. PRESSURE MILL C	SEAL AIR	1	1057 / 793	1162 / 1009	mmWC	--	50/331	DP>203	--	0 - 400
37	HFW23CP002	SEAL AIR TO UNDER BOWL DIFF. PRESSURE MILL C	SEAL AIR	1	1057 / 793	1162 / 1009	mmWC	--	50/331	DP>203	--	0 - 400
38	HFW24CP001	SEAL AIR TO UNDER BOWL DIFF. PRESSURE MILL D	SEAL AIR	1	1057 / 793	1162 / 1009	mmWC	--	50/331	DP>203	--	0 - 400
39	HFW24CP002	SEAL AIR TO UNDER BOWL DIFF. PRESSURE MILL D	SEAL AIR	1	1057 / 793	1162 / 1009	mmWC	--	50/331	DP>203	--	0 - 400
40	HFW25CP001	SEAL AIR TO UNDER BOWL DIFF. PRESSURE MILL E	SEAL AIR	1	1057 / 793	1162 / 1009	mmWC	--	50/331	DP>203	--	0 - 400
41	HFW25CP002	SEAL AIR TO UNDER BOWL DIFF. PRESSURE MILL E	SEAL AIR	1	1057 / 793	1162 / 1009	mmWC	--	50/331	DP>203	--	0 - 400
42	HFW26CP001	SEAL AIR TO UNDER BOWL DIFF. PRESSURE MILL F	SEAL AIR	1	1057 / 793	1162 / 1009	mmWC	--	50/331	DP>203	--	0 - 400
43	HFW26CP002	SEAL AIR TO UNDER BOWL DIFF. PRESSURE MILL F	SEAL AIR	1	1057 / 793	1162 / 1009	mmWC	--	50/331	DP>203	--	0 - 400
44	HFW27CP001	SEAL AIR TO UNDER BOWL DIFF. PRESSURE MILL G	SEAL AIR	1	1057 / 793	1162 / 1009	mmWC	--	50/331	DP>203	--	0 - 400
45	HFW27CP002	SEAL AIR TO UNDER BOWL DIFF. PRESSURE MILL G	SEAL AIR	1	1057 / 793	1162 / 1009	mmWC	--	50/331	DP>203	--	0 - 400
46	HFW28CP001	SEAL AIR TO UNDER BOWL DIFF. PRESSURE MILL H	SEAL AIR	1	1057 / 793	1162 / 1009	mmWC	--	50/331	DP>203	--	0 - 400
47	HFW28CP002	SEAL AIR TO UNDER BOWL DIFF. PRESSURE MILL H	SEAL AIR	1	1057 / 793	1162 / 1009	mmWC	--	50/331	DP>203	--	0 - 400
48	HFW20CP001	SEAL AIR FAN DISCHARGE/ CPA HEADER DIFF. PRESSURE	SEAL AIR	1	1057 / 1043	1162 / 1389	mmWC	--	50	--	--	0 - 600
49	HFW20CP002	SEAL AIR FAN DISCHARGE/ CPA HEADER DIFF. PRESSURE	SEAL AIR	1	1057 / 1043	1162 / 1389	mmWC	--	50	--	--	0 - 600
50	HHQ20CP002	SCANNER AIR/FURNACE DIFF. PRESSURE	SCA. AIR / FLUE GAS	1	522 / -3	641 / -4	mmWC	33/ 1126	45/ 1200	DP=525	DP=645	0 - 1000

Sl no	Instrument Tag	Description	Medium	Qty/ Blr	Op. Press.	Max. Press.	Unit of Pressure	Op. Temp. (°C)	Max. Temp. (°C)	Op. DP	Max. DP	Calibration Range
51	HHQ20CP003	SCANNER AIR/FURNACE DIFF. PRESSURE	SCA. AIR / FLUE GAS	1	522 / -3	641/ -4	mmWC	33/ 1126	45/ 1200	DP=525	DP=645	0 - 1000
52	HBK10CP006	FURNACE TO HOT PA HEADER DIFF. PRESSURE - LEFT	FLUE GAS / PY. AIR	1	-3/ 957	-4/ 1212	mmWC	1170 / 314	1300/ 317	DP= 960	DP= 1216	0 - 1600
53	HBK10CP007	FURNACE TO HOT PA HEADER DIFF. PRESSURE - LEFT	FLUE GAS / PY. AIR	1	-3/ 957	-4/ 1212	mmWC	1170 / 314	1300/ 317	DP= 960	DP= 1216	0 - 1600
54	HBK15CP006	FURNACE TO HOT PA HEADER DIFF. PRESSURE - RIGHT	FLUE GAS / PY. AIR	1	-3/ 957	-4/ 1212	mmWC	1170 / 314	1300/ 317	DP= 960	DP= 1216	0 - 1600
Notes: 1. For Datasheet Sl Nos: 14 to 17, Vendor shall supply transmitters with Diaphragm Seal and 5 m Capillary												

a	Site Conditions:			
i	Altitude above mean sea level	316 m above MSL		
ii	Ambient temperature condition	13 - 41 °C		
iii	Relative humidity	73%		
b	Technical Data:			
Sl no	Calibration Range	Unit of Pressure	Qty/ Blr	Unit
Pressure Transmitters				
1	(-)250 - 250	mmWC	2	No
2	0 - 10	kg/cm ²	2	No
3	0 - 30	kg/cm ²	2	No
4	0 - 30 (Diaphragm Seal)	kg/cm ²	2	No
5	0 - 350	kg/cm ²	2	No
Differential Pressure Transmitters				
6	0 - 400	mmWC	3	Nos
7	0 - 600	mmWC	2	No
8	0 - 1000	mmWC	2	No
9	0 - 1600	mmWC	2	No
Note: For Datasheet Sl No. 4, Vendor shall supply pressure Transmitter with Diaphragm Seal and 5 m Capillary				

a Site Conditions:														
i	Altitude above mean sea level		10m above MSL											
ii	Ambient temperature condition		24 - 41.5 °C											
iii	Relative humidity		65-72 %											
b Technical Data:														
Sl. No.	Instrument Tag	Description	Medium	Qty/ Blr.	Op. Press.	Max. Press.	Unit of Press.	Op. Temp.	Max. Temp.	Unit of Temp.	Op. DP	Max. DP	Calibration Range	Calibration Units
1	HS11CP002	SCR REACTOR A - DP ACROSS CATALYST LAYER 1	FLUE GAS	1	-101	-150	mmWC	344	427	°C	8.8	50	0 - 80	mmWC
2	HS11CP003	SCR REACTOR A - DP ACROSS CATALYST LAYER 2	FLUE GAS	1	-101	-150	mmWC	344	427	°C	8.8	50	0 - 80	mmWC
3	HS11CP004	SCR REACTOR A - DP ACROSS CATALYST LAYER 3	FLUE GAS	1	-101	-150	mmWC	344	427	°C	8.8	50	0 - 80	mmWC
4	HS12CP002	SCR REACTOR B - DP ACROSS CATALYST LAYER 1	FLUE GAS	1	-101	-150	mmWC	344	427	°C	8.8	50	0 - 80	mmWC
5	HS12CP003	SCR REACTOR B - DP ACROSS CATALYST LAYER 2	FLUE GAS	1	-101	-150	mmWC	344	427	°C	8.8	50	0 - 80	mmWC
6	HS12CP004	SCR REACTOR B - DP ACROSS CATALYST LAYER 3	FLUE GAS	1	-101	-150	mmWC	344	427	°C	8.8	50	0 - 80	mmWC
7	HSK30CP001	DIFF PRESSURE ACROSS STRAINER AT AMMONIA FORWARDING PUMP A INLET	AMMONIA	1	9.9	21	kg/cm ²	27	53	°C	0.01	0.05	0-800	mmWC
8	HSK31CP001	DIFF PRESSURE ACROSS STRAINER AT AMMONIA FORWARDING PUMP B INLET	AMMONIA	1	9.9	21	kg/cm ²	27	53	°C	0.01	0.05	0-800	mmWC
9	HSF20CP002	SONIC HORN SYSTEM OF SCR REACTOR A- DP ACROSS FILTER	AIR	1	7	--	kg/cm ²	27	--	°C	--	0.14	0 - 1	Kg/cm ²
10	HSF30CP002	SONIC HORN SYSTEM OF SCR REACTOR B- DP ACROSS FILTER	AIR	1	7	--	kg/cm ²	27	--	°C	--	0.14	0 - 1	Kg/cm ²
DP Type Flow Transmitter														
11	HSF20CF001	SONIC HORN SYSTEM OF SCR REACTOR A-AIR FLOW	AIR	1	7	--	kg/cm ²	27	--	°C	100	--	0-100	mmWC
12	HSF30CF001	SONIC HORN SYSTEM OF SCR REACTOR B-AIR FLOW	AIR	1	7	--	kg/cm ²	27	--	°C	100	--	0-100	mmWC
DP Type Level Transmitter														
13	HSI20CL002	ANHYDROUS AMMONIA TANK A LEVEL - DP TYPE	AMMONIA	1	10	23	kg/cm ²	27	50	°C	3.3	--	0-3.3	meters
14	HSI21CL002	ANHYDROUS AMMONIA TANK B LEVEL - DP TYPE	AMMONIA	1	10	23	kg/cm ²	27	50	°C	3.3	--	0-3.3	meters

NOTES:

1. For Datasheet SI Nos. 7 & 8, Differential Pressure Transmitters shall be Diaphragm Seal Type with 5m Capillary & end Connection of 1/2" NPT(M).

2. For Datasheet SI Nos. 13 & 14, Differential Pressure Transmitters shall be Diaphragm Seal Type with end Connection suitable for 2" Flange and 15 m capillary.

3. For Datasheet SI Nos: 7, 8, 13 & 14 - Differential Pressure Transmitters shall be Explosion Proof (Gas group: NEPA 70 Class 1, Div. 1, Group D) or equivalent with PESO Certification.

NOTES:

- For Datasheet SI Nos. 7 & 8, Differential Pressure Transmitters shall be Diaphragm Seal Type with 5m Capillary & end Connection of 1/2" NPT(M).
- For Datasheet SI Nos. 13 & 14, Differential Pressure Transmitters shall be Diaphragm Seal Type with end Connection suitable for 2" Flange and 15m capillary.
- For Datasheet SI Nos: 7, 8, 13 & 14 - Differential Pressure Transmitters shall be Explosion Proof (Gas group: NFPA 70 Class 1, Div. 1, Group D) or equivalent with PESO Certification.

Prepared & Checked : NR
Approved :AKP

N. R. Bhusawal
AKP

a	Site Conditions:			
i	Altitude above mean sea level	316 m above MSL		
ii	Ambient temperature condition	13 - 41 °C		
iii	Relative humidity	73%		
b	Technical Data:			
Sl no	Calibration Range	Unit of Pressure	Qty/ Blr	Unit
Differential Pressure Transmitters				
1	0 - 80	mmWC	2	No
2	0 - 800	mmWC	2	No
3	0 - 1	kg/cm ²	2	No
4	0 - 100	mmWC	2	No
5	0 - 3.3	m	2	No
Note:				
1. For Datasheet Sl Nos. 2, Differential Pressure Transmitters shall be Diaphragm Seal Type with 5m Capillary & end Connection of 1/2" NPT(M).				
2. For Datasheet Sl Nos. 5, Differential Pressure Transmitters shall be Diaphragm Seal Type with end Connection suitable for 2" Flange and 15 m capillary.				
3.For Datasheet Sl Nos. 2 & 5 - Differential Pressure Transmitters shall be Explosion Proof (Gas group: NFPA 70 Class 1, Div. 1, Group D) or equivalent with PESO Certification.				
4.For Datasheet Sl Nos. 1, 3 & 4 - Differential Pressure Transmitters shall be Weather Proof IP65.				

a Site Conditions:											
i	Altitude above mean sea level			10m above MSL							
ii	Ambient temperature condition			24 - 41.5 °C							
iii	Relative humidity			65-72 %							
b Technical Data:											
Sl. No.	Instrument Tag	Description	Medium	Qty/ Blr.	Op. Temp.	Max. Temp.	Unit of Temp.	Op. Pressure	Max. Pressure	Unit of Pressure	Range
1	HSA11CP001	SCR REACTOR A INLET PRESSURE	FLUE GAS	1	344	427	°C	-101	-150	mmWC	(-)200 - 200
2	HSA21CP001	SCR REACTOR B INLET PRESSURE	FLUE GAS	1	344	427	°C	-101	-150	mmWC	(-)200 - 200
3	HSA11CP005	SCR REACTOR A OUTLET PRESSURE	FLUE GAS	1	344	427	°C	-259	-376	mmWC	(-)500 - 500
4	HSA21CP005	SCR REACTOR B OUTLET PRESSURE	FLUE GAS	1	344	427	°C	-259	-376	mmWC	(-)500 - 500
5	HSG10CP001	DILUTION AIR BLOWER A OUTLET PRESSURE	DILUTION AIR	1	27	50	°C	525	555	mmWC	0 - 700
6	HSG10CP002	DILUTION AIR BLOWER A OUTLET PRESSURE	DILUTION AIR	1	27	50	°C	525	555	mmWC	0 - 700
7	HSG11CP001	DILUTION AIR BLOWER A OUTLET PRESSURE	DILUTION AIR	1	27	50	°C	525	555	mmWC	0 - 700
8	HSG11CP002	DILUTION AIR BLOWER A OUTLET PRESSURE	DILUTION AIR	1	27	50	°C	525	555	mmWC	0 - 700
9	HSG12CP001	DILUTION AIR HEATER INTERCONNECTION LINE PRESSURE	DILUTION AIR	1	150	160	°C	425	555	mmWC	0 - 700
10	HSF20CP001	SONIC HORN SYSTEM OF SCR REACTOR A-RECEIVER TANK OUTLET PRESSURE	AIR	1	27	--	°C	7	--	kg/cm ²	0 - 10
11	HSF21CP001	SONIC HORN SYSTEM OF SCR REACTOR A-LAYER 1 AIR PRESSURE	AIR	1	27	--	°C	7	--	kg/cm ²	0 - 10
12	HSF22CP001	SONIC HORN SYSTEM OF SCR REACTOR A-LAYER 2 AIR PRESSURE	AIR	1	27	--	°C	7	--	kg/cm ²	0 - 10
13	HSF23CP001	SONIC HORN SYSTEM OF SCR REACTOR A-LAYER 3 (FUTURE) AIR PRESSURE	AIR	1	27	--	°C	7	--	kg/cm ²	0 - 10
14	HSF25CP001	ASH SWEEPER SYSTEM OF SCR REACTOR A-AIR PRESSURE	AIR	1	27	--	°C	7	--	kg/cm ²	0 - 10

Prepared & Checked : NR
Approved : AKP



Sl. No.	Instrument Tag	Description	Medium	Qty/Blr.	Op. Temp.	Max. Temp.	Unit of Temp.	Op. Pressure	Max. Pressure	Unit of Pressure	Range
15	HSF30CP001	SONIC HORN SYSTEM OF SCR REACTOR B-RECEIVER TANK OUTLET PRESSURE	AIR	1	27	--	°C	7	--	kg/cm ²	0 - 10
16	HSF31CP001	SONIC HORN SYSTEM OF SCR REACTOR B-LAYER 1 AIR PRESSURE	AIR	1	27	--	°C	7	--	kg/cm ²	0 - 10
17	HSF32CP001	SONIC HORN SYSTEM OF SCR REACTOR B-LAYER 2 AIR PRESSURE	AIR	1	27	--	°C	7	--	kg/cm ²	0 - 10
18	HSF33CP001	SONIC HORN SYSTEM OF SCR REACTOR B-LAYER 3 (FUTURE) AIR PRESSURE	AIR	1	27	--	°C	7	--	kg/cm ²	0 - 10
19	HSF35CP001	ASH SWEEPER SYSTEM OF SCR REACTOR B-AIR PRESSURE	AIR	1	27	--	°C	7	--	kg/cm ²	0 - 10
20	HSL20CP001	WASTE WATER RETAINING BASIN PUMP A OUTLET PRESSURE	AMMONIA	1	27	50	°C	10	10	kg/cm ²	0 - 16
21	HSQ20CP001	FIRE PROTECTION WATER LINE PRESSURE	WATER	1	27	--	°C	10	--	kg/cm ²	0 - 16
22	HSJ15CP001	COMPRESSOR TANK A PRESSURE	AMMONIA	1	27	50	°C	12	19.7	kg/cm ²	0 - 25
23	HSJ15CP002	COMPRESSOR A OUTLET PRESSURE	AMMONIA	1	27	50	°C	12	19.7	kg/cm ²	0 - 25
24	HSJ16CP001	COMPRESSOR TANK B PRESSURE	AMMONIA	1	27	50	°C	12	19.7	kg/cm ²	0 - 25
25	HSJ16CP002	COMPRESSOR B OUTLET PRESSURE	AMMONIA	1	27	50	°C	12	19.7	kg/cm ²	0 - 25
26	HSJ20CP001	ANHYDROUS AMMONIA TANK A PRESSURE	AMMONIA	1	27	50	°C	10	23	kg/cm ²	0 - 30
27	HSJ21CP001	ANHYDROUS AMMONIA TANK B PRESSURE	AMMONIA	1	27	50	°C	10	23	kg/cm ²	0 - 30
28	HSK30CP002	AMMONIA FORWARDING PUMP A INLET PRESSURE	AMMONIA	1	27	53	°C	9.9	21	kg/cm ²	0 - 30
29	HSK31CP002	AMMONIA FORWARDING PUMP B INLET PRESSURE	AMMONIA	1	27	53	°C	9.9	21	kg/cm ²	0 - 30
30	HSK30CP003	AMMONIA FORWARDING PUMP A OUTLET PRESSURE	AMMONIA	1	27	53	°C	17	30	kg/cm ²	0 - 40
31	HSK30CP004	AMMONIA FORWARDING PUMP A OUTLET PRESSURE	AMMONIA	1	27	53	°C	17	30	kg/cm ²	0 - 40

Sl. No.	Instrument Tag	Description	Medium	Qty/Blr.	Op. Temp.	Max. Temp.	Unit of Temp.	Op. Pressure	Max. Pressure	Unit of Pressure	Range
32	HSK31CP003	AMMONIA FORWARDING PUMP B OUTLET PRESSURE	AMMONIA	1	27	53	°C	17	30	kg/cm ²	0 - 40
33	HSK31CP004	AMMONIA FORWARDING PUMP B OUTLET PRESSURE	AMMONIA	1	27	53	°C	17	30	kg/cm ²	0 - 40
34	HSK40CP001	AMMONIA INJECTION SKID A PRESSURE	AMMONIA	1	27	53	°C	17	30	kg/cm ²	0 - 40
35	HSK45CP001	AMMONIA INJECTION SKID B PRESSURE	AMMONIA	1	27	53	°C	17.5	30	kg/cm ²	0 - 40
36	HSL10CL001	WASTE AMMONIA DILUTION TANK LEVEL	AQ. AMMONIA	1	27	50	°C	0	0	meters	0 - 2.5

NOTES:

1. For Datasheet SI Nos: 20 and 22- 35, Pressure Transmitters in Ammonia Process Lines shall be Diaphragm Seal Type with 5m Capillary & end Connection of 1/2" NPT(M).
2. For Datasheet SI Nos: 34 & 35- Pressure Transmitters shall be Weather Proof IP65.
3. For Datasheet SI Nos: 20, 22 to 33 & 36 - Pressure Transmitters shall be Explosion Proof (Gas group: NFPA 70 Class 1, Div. 1, Group D) or equivalent with PESO Certification.

Prepared & Checked : NR
Approved :AKP

a	Site Conditions:			
i	Altitude above mean sea level	316 m above MSL		
ii	Ambient temperature condition	13 - 41 °C		
iii	Relative humidity	73%		
b	Technical Data:			
Sl no	Calibration Range	Unit of Pressure	Qty/ Blr	Unit
Pressure Transmitters				
1	(-)200 - 200	mmWC	2	No
2	(-)500 - 500	mmWC	2	No
3	0 - 700	mmWC	2	No
4	0 - 10	kg/cm ²	2	No
5	0 - 16	kg/cm ²	2	No
6	0 - 16	kg/cm ²	2	Nos
7	0 - 25(Diaphragm Seal)	kg/cm ²	2	No
8	0 - 30(Diaphragm Seal)	kg/cm ²	2	No
9	0 - 40(Diaphragm Seal)	kg/cm ²	2	No
10	0 - 2.5	m	2	No
Note: For Datasheet Sl No. 7 to 9, Vendor shall supply Pressure Transmitter with Diaphragm Seal, 5 m Capillary and Explosion Proof (Gas group: NFPA 70 Class 1, Div. 1, Group D) or equivalent with PESO Certification.				



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**PURCHASE / MM / BOI
ENQUIRY DEVIATION**

PAGE

1 OF 1

**SCHEDULE OF DEVIATION TO
BOI ENQUIRY NO:**

GEM/2021/B/1383549

DATE

26.07.2021

DESCRIPTION**INSTRUMENTATION FIELD TRANSMITTERS, DENOX SYSTEM FIELD
TRANSMITTERS & TEMPERATURE ELEMENTS FOR COAL FIRED THERMAL
POWER PLANT****SPECIFICATION**

TCI:162/00 & TCI:1727-SCR/162/00

QUALITY PLAN

CI:QA:1727: CQP:11/01

PACKING PROCEDURE

QA:CI: STD:PR:04/03

DATASHEETSDSH:162/1727/00, DSH:162/1727-S/01
DSH:162-PT/1727-SCR/00, DSH:162-PT/1727-SCR-S/00
DSH:162-DPT/1727-SCR/00, DSH:162-DPT/1727-SCR-S/00**DOCUMENT REFERENCE****BHEL ENQ. CALLED FOR****FIRM'S ALTERNATIVE OFFER**CERTIFIED THAT OTHER THAN THE ABOVE DEVIATIONS, WE ARE ACCEPTING ALL THE OTHER
SPECIFICATIONS AND REQUIREMENTS IN FULL TO YOUR ENQUIRY.

STATION:

DATE:

SIGNATURE OF COMPANY REPRESENTATIVE

COMPANY SEAL

NOTE 1. Deviations should be taken only in the extreme case.

2. If necessary, use additional sheets with page control number.



**PURCHASE / M M / BOI
ENQUIRY DEVIATION**

429-024

PAGE

1 OF 1

**SCHEDULE OF DEVIATION TO
BOI ENQUIRY NO:**

GEM / 2021/ B/ 1383549

DATE

26.07.2021

DESCRIPTION	INSTRUMENTATION FIELD TRANSMITTERS, DENOX SYSTEM FIELD TRANSMITTERS & TEMPERATURE ELEMENTS FOR COAL FIRED THERMAL POWER PLANT	
SPECIFICATION	TCI:1727-SCR/ ULT/ 00	
QUALITY PLAN	CI:QA:1727: CQP:11/ 01	
PACKING PROCEDURE	QA:CI: STD:PR:04/ 03	
DATASHEETS	N/ A	
DOCUMENT REFERENCE	BHEL ENQ. CALLED FOR	FIRM'S ALTERNATIVE OFFER

CERTIFIED THAT OTHER THAN THE ABOVE DEVIATIONS, WE ARE ACCEPTING ALL THE OTHER SPECIFICATIONS AND REQUIREMENTS IN FULL TO YOUR ENQUIRY.

STATION:

DATE:

SIGNATURE OF COMPANY REPRESENTATIVE

COMPANY SEAL

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