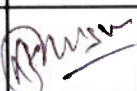
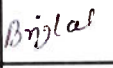


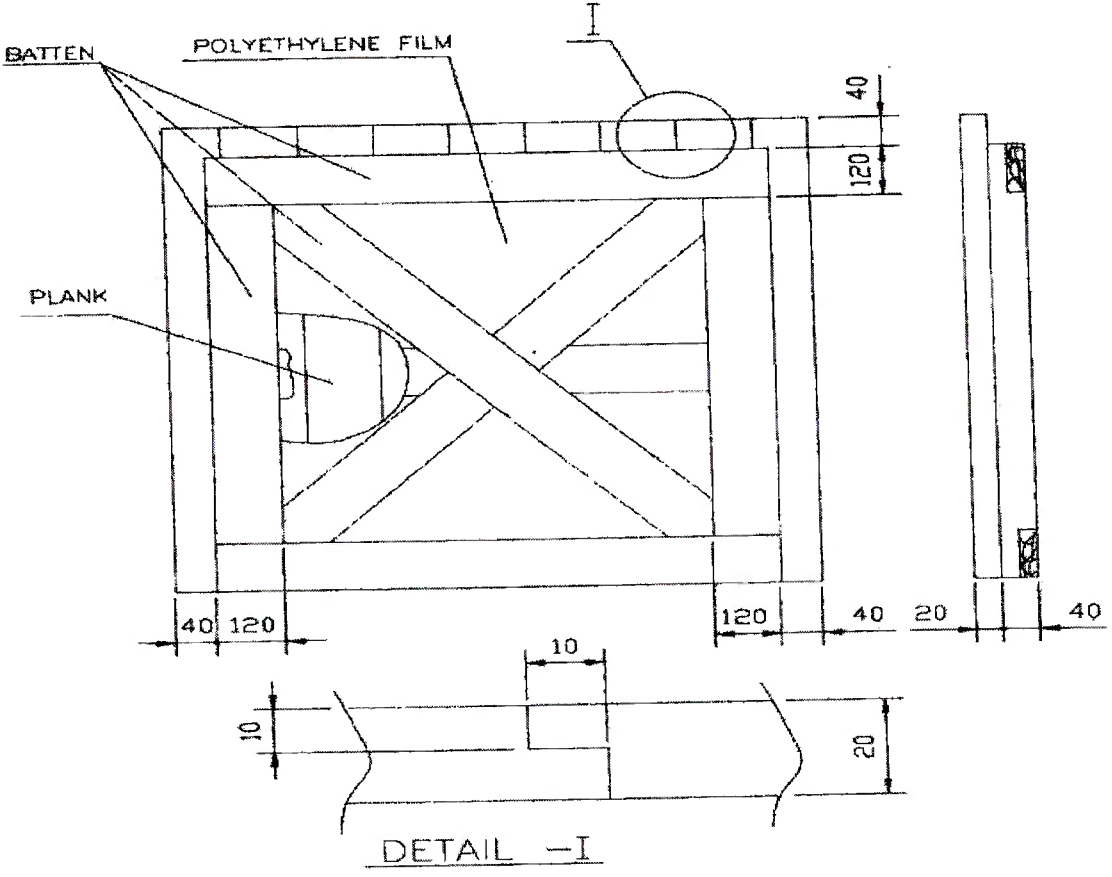
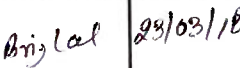
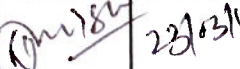
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				पृष्ठ 10 का 1 Page 1 of 10	
SUPERSEDES INVENTORY NO	GENERAL AND SEAWORTHY PACKING INSTRUCTIONS FOR TURBINE INSTRUMENTATION EQUIPMENT & ACCESSORIES				
BASED ON OWN EXPERIENCE					
1.0 SCOPE:					
This instruction covers the packing instruction for the safe dispatch and delivery of turbine instrumentation equipment like Electronic modules/ components, Indicator, Recorders, Transmitter, gauges, switches and other allied items, control cabinets & desks, Fitting, mounting accessories, impulse pipe lines and other related equipment and accessories.					
2.0 INTRODUCTION:					
The Turbine instrumentation equipment, components, cabinets and other accessories are of precision storage and special packaging is necessary to ensure safe transit and delivery of these items at the sites. Packaging should be done to protect these sophisticated and precision items against damage by means of shocks and vibration during handling and transportation, moisture, dust and other adverse climatic and environmental conditions. This specification is arranged in section as below:					
- SECTION A: General packaging instructions common for all categories of items. - SECTION B: Electronic modules, instruments & allied items. - SECTION C: Starter panels. - SECTION D: Fitting, mounting accessories and - SECTION E: Impulse pipes.					
स्वत्वाधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत के सभी गैरसहकारी निगमों की सम्पत्ति है। इसका प्रयोग या इसका प्रसारण अन्य किसी भी उद्देश्य के बिना नहीं किया जाय।	दिनांक एवं हस्ताक्षर SIGN & DATE 27/3/18				
मासिक सूची संख्या INVENTORY NO. P-5284	STE QAX TSX महामन विभाग AGREED DEPTT.	D.K. RAY S. Chandra LALIT KUMAR नाम NAME	[Signature] [Signature] [Signature] दिनांक एवं हस्ताक्षर DATE & SIGNATURE	अनुवादक TRANSLATED BY निर्माणकर्ता WORKED BY जांचकर्ता CHECKED BY पर्यवेक्षणकर्ता SUPERVISED BY	नाम NAME BRIJ LAL RAM LAXMI KANT MISHRA VINOD KUMAR
REAFFIRM YEAR-2025			स्वीकृति APPROVED : B.S.RANA		दिनांक एवं हस्ताक्षर SIGNATURE & DATE 23/3/18
REV.NO. 02 Dt. 24/02/2025 CHANGE ADVICE NO. TSX(CIE)-25-47	निर्माण PREPARED : C.I.E		जारी ISSUED : TSX		दिनांक DATE : 16.03.81

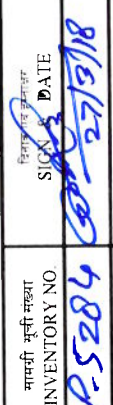
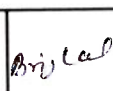
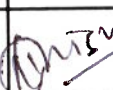
ST33002 पृष्ठ 10 का 2 Page 2 of 10	
 उत्पाद मानक (हीप : हरिद्वार) PRODUCT STANDARD (HEEP: HARIDWAR)	
BHEL भारतीय मूल मंत्रालय भारतीय मूल मंत्रालय	SUPERSEDES INVENTORY भारतीय मूल मंत्रालय भारतीय मूल मंत्रालय
3.0 PACKAGING INSTRUCTIONS : 3.1 (A) GENERAL : (i) The packaging should be done in a clean, dust free packing area/room. (ii) Wherever possible, the original packing materials like thermocol box/ chips, packing paper, board, cotton waste, rubberized coir, wood wool etc. should be used for packaging of these equipments etc. (iii) All the items should be thoroughly checked for any possible mechanical damage/ distortion/ dents and rust/ corrosion etc. Appropriate rectification measures should be taken to remove such defects and if required engineering division should be consulted. (iv) While packaging, all the items should be temporarily stored on raised wooden platform covered with clean parchment paper. (v) The repacking of all the bought out items must be done in the original way as they were received from the manufacturers/ suppliers. It must be ensured that the polythene bags are properly sealed, air tight and sufficient cushioning with rubberized coir or wood wool has been provided to various items and containers/ boxes. (vi) The packing box should be made water proof by putting a continuous barrier of water- proof bitumen paper/craft paper over the internal surfaces of the box to make it sufficiently impervious to water, and small silica gel bags suitably placed inside the packages. This can be done by using tar felt on the top of all the boxes. It should project by 50mm on all the sides and projected part should be nailed and overlap of the tar felt should be avoided. (vii) The packaging should be done in such a way that the individual instruments/ containers/ boxes do not have relative movement inside the packing box during handling and transportation. Sufficient stiffness should be provided on the packing boxes to withstand mechanical shocks/ vibrations and other transit hazards. (viii) Wherever necessary, threaded/ machined portion should be coated with grease and wrapped with wax paper and tied with thread. Alternatively, threaded part may be wrapped with corrugated paper.	
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company	स्वतन्त्राधिकार एवं गोपनीय इस दस्तावेज में दी गई जानकारी भारत भारती लिमिटेड की संपत्ति है। इसका प्रयोग अन्य व्यक्ति या संगठन के बिना भारत भारती लिमिटेड के विना अनुमति के नहीं किया जा सकता।
SIGN & DATE 23/03/18	REV. NO. 02
INVENTORY NO. P-5284	निर्माणकर्ता WORKED BY BRIJ LAL RAM
जांचकर्ता CHECKED BY LAXMIKANT MISHRA	23/03/18

निम्नक एवं दिनांक SIGN & DATE		उत्पाद मानक (हीप : हरिद्वार) PRODUCT STANDARD (HEEP: HARIDWAR)		ST33002	
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SUPERSEDES INVENTORY नामकी सूची संख्या को प्रतिस्थापित करना है	3.2 (B) ELECTRONIC MODULES INSTRUMENTS AND ALLIED ITEMS: (i) All the Electronic modules/instruments and accessories should bear respective tag numbers as indicated in the shipping list. (ii) Individual instruments like indicators, recorders, transmitters, gauges, switches, detectors and electronic modules/ components should be sealed air tight in polythene bags which should contain silica gel in small bags of cotton cloth. Also volatile corrosion inhibitor (VCI) powder on table can be put in the bags/boxes containing the instruments. (iii) After sealing in polythene bags these items should be packed in small sized boxes, preferably original ones, with sufficient thermocol chip/ molded thermocol box/ card board box as the case may be. These boxes should be packed with sticking cello tapes and cotton tapes. (iv) The outside of these smaller boxes should carry dispatch unit number, packing box number and the tag number of the instrument/ equipment as shown in the shipping list. (v) Number of such small sized boxes should be kept in bigger sized box/carbon and these boxes/cartons should be in turn securely placed in the packing box in such a way that no damaged occurs because of handling, shifting, lifting or transportation. (vi) Thermocouple and Resistance thermometer shall be packed in suitable sized wooden box with appropriate & sufficient cushioning materials.				
3.3 (C) CABINETS & STARTER PANELS : (i) The cabinet or starter panels should be clamped securely and firmly to the base plate of packing box with suitable nuts & bolts. (ii) The cabinets or starter panels shall be sealed airtight with polythene bags and a cotton bag containing silica gel shall be place inside the cabinets. As the cabinets/ starter panels etc. contain small mechanical contacts so VCI paper can be wrapped all around and fixed with tape. (iii) Sufficient stiffness/braces with padded cushions should be provided to ensure rigid packing.					
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited It must not be used directly or indirectly in any way detrimental to the interest of the company	स्वत्वाधिकार एवं गोपनीय इस प्रलेख में दी गई जानकारी भारत भारती लिमिटेड की संपत्ति है। इसका प्रयोग अन्य उद्देश्य के लिए या इस जानकारी के बिना किसी भी प्रकार से न किया जाय				
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नामकी सूची संख्या INVENTORY NO. P-5284	REV. NO. 02		निर्माणकर्ता WORKED BY BRIJ LAL RAM	Brij Lal	23/03/18
			जांचकर्ता CHECKED BY LAXMIKANT MISHRA		26/03/18

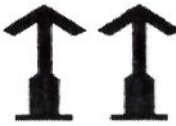
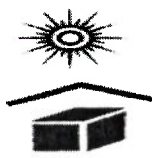
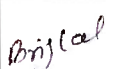
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SUPERSEDES INVENTORY	3.4 (D) FITTINGS & MOUNTING ACCESSORIES ETC. : (i) This category includes items like instrument valves, nipples, brackets, fasteners etc. (ii) Apply appropriate coating of grease on the threaded and machine portion and wrap the individual item with wax paper and tie with thread.				
सामग्री सूची क्या हो प्रतिबिम्बित करना है					
3.5 (E) IMPULSE PIPE LINES : (i) Impulse pipe lines are to be closed at both the ends by rubber plugs/ Neoprene grommets to prevent the clogging of pipelines by foreign materials/ dust, wood powder etc. (ii) While packing these pipelines care should be taken that no heavy material is put on top of them. This is necessary to ensure protection against mechanical damage. (iii) All the impulse pipe lines in a packing box should be tied with steel wires in small groups of 10-15 pipe lines (iv) Due care should be taken so that loose item such as above do not collide with each other causing damage to thread /machined port.					
4.0 SEA-WORTHY PACKING INSTRUCTIONS FOR EXPORT PROJECTS AND SEA COASTAL PROJECTS:					
4.1 GENERAL The standard covers guide lines for making Sea- worthy standard packing boxes to be used for transportation for export orders. Vendors shall be responsible for packing and shall meet the minimum requirements specified herein.					
4.2 SCOPE IN ADDITION TO CLAUSE NO. 1.0 AS ABOVE The procedure specifies minimum guidelines to be complied with for packing of electrical and electronic Components /Assemblies/Equipments. This specification shall be suitable for different handling operations and the adverse conditions during transportation and during indoor/outdoor storage for period of minimum two years.					
4.3 WOOD SPECIFICATION FOR PACKING The wood used for packing shall conform to specification ISPM NO. 15. (International Standards for Phytosanitary Measures).					
निष्कर्ष एवं तारीख SIGN & DATE	REV. NO. 02				
सामग्री सूची संख्या INVENTORY NO.	निर्माणकर्ता WORKED BY		BRIJ LAL RAM		28/03/18
P-5284	जांचकर्ता CHECKED BY		LAXMIKANT MISHRA		28/03/18

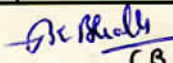
निर्माता एवं प्रमाणित SIGN & DATE		उत्पाद मानक (हीप : हरिद्वार) PRODUCT STANDARD (HEEP: HARIDWAR)		ST33002 पृष्ठ 10 का 5 Page 5 of 10	
SUPERSEDES INVENTORY	सामग्री सूची में क्या हो अप्रतिष्ठित होगा है	4.4 REQUIREMENTS FOR PACKING CASE: 4.4.1 All equipment and materials shall be suitably coated wrapped, or covered and boxed or crated for export shipment so as to prevent damage during handling and storage at the Site. Cardboard containers (if any) shall be enclosed in a solid wooden container to avoid damage during transit. 4.4.2 Equipment and process materials shall be packed and semi knocked down, to the extent possible, to facilitate handling and storage and to protect bearings and other machine surfaces from oxidation. Each container box, crate or bundle shall be reinforced with steel strapping, in such a manner that breaking of one strap will not cause complete failure of the packaging. The packing shall be of best standard to withstand rough handling and to provide suitable protection from tropical weather while in transit and while awaiting erection at the site. 4.4.3 Waterproof paper and felt linings shall overlap at seams at least 15mm and the seams shall be secured together. 4.4.4 Equipment and materials in wooden cases or crates shall be properly cushioned to withstand the abuse of handling, transportation and storage. Packing shall include preservatives suitable for tropical conditions. All machine surfaces and bearings shall be coated with oxidation preventative compounds. All parts subject to damage when in contact with water shall be coated with suitable grease and wrapped in heavy asphalt or tar impregnated paper. 4.4.5 Fumigation of boxes including plywood/spacers shall be carried out as per ISPM 15 to make it pest free. All wood packing in each consignment shall be free from bark and all visible signs and fungal attack at the time of shipment. 4.4.6 Components sub-assemblies and assemblies sensitive to climatic conditions shall be packed seal tight. All the openings of the sensitive components, sub-assemblies and assemblies shall be blanketed to prevent the ingress of dust and moisture. The components sub-assemblies and assemblies shall be completely covered with 2 layers of polyethylene sheet. Polyethylene sheet to be used shall be UV stabilized. All sharp corners and edges are to be protected by rubber mats to prevent damage the polyethylene sheet. Top surface of the case shall be free from dents to prevent rain water pockets.			
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स्वत्वाधिकार एवं गोपनीय इस प्रत्यक्ष में की गई सूचना भारत भारती गैरनिर्देशित निर्यात की सम्पत्ति है, उपर्युक्त प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग को कि, कम्पनी के हित में हानिकारक हो न किता जाय।					
निर्माता एवं प्रमाणित SIGN & DATE					
सामग्री सूची संख्या INVENTORY NO.	REV. NO. 02		निर्माणकर्ता WORKED BY	BRIJ LAL RAM	 28/03/18
P-5286			जांचकर्ता CHECKED BY	LAXMIKANT MISHRA	 28/03/18

SIGNATURE SIGN & DATE		उत्पाद मानक (हीप : हरिद्वार) PRODUCT STANDARD (HEEP: HARIDWAR)		ST33002 पृष्ठ 10 का 6 Page 6 of 10	
SUPERSEDES INVENTORY	4.4.7 The four sides shall be lined, from inside with multi-layered polyethylene sheet of at least 120 GSM and tacked at suitable places. Whenever specified in addition to the polyethylene sheet the top cover will have a layer of bitumen felt over the cover. This should project about 100 - 250 mm on all sides shall be provided between frame and planks of the end and side shook as shown in Fig. (For reference only.)				
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company	END SHOOK 				
स्वाधिकार एवं गोपनीय इस प्रलेख में की गई सूचना भारत के वी एनईएलसी लिमिटेड की संपत्ति है। इसका प्रयोग अन्य उद्देश्य के लिए बिना लिखित अनुमति के नहीं किया जाये।					
SIGNATURE SIGN & DATE					
INVENTORY NO. P-5284	REV. NO. 02		निर्माणकर्ता WORKED BY	BRIJ LAL RAM	
			जांचकर्ता CHECKED BY	LAXMIKANT MISHRA	

निम्नलिखित जानकारी SIGN & DATE		उत्पाद मानक (हीप : हरिद्वार)		ST33002	
		PRODUCT STANDARD (HEEP: HARIDWAR)		पृष्ठ 10 का 8 Page 8 of 10	
SUPERSEDES INVENTORY	All packages shall be covered on all sides with suitable GI sheets.				
मामूली सूची संख्या को प्रतिबिम्बित करना है	4.4.8 Cover the whole equipment with polyethylene sheet of at least 120 GSM, on all sides preferably by a single piece. 4.4.9 Silica gel is used for this purpose to protect the contents over sufficiently long time from corrosion. At the time of use, silica gel should be so dried that its color becomes dark blue. These shall be filled in small cotton bags. Before sealing the equipment, the silica gel bags should be kept inside the polyethylene film cover at different locations. The quantity of silica gel should not be less than 2.0 Kg per m3 volume of the packing box. 4.4.10 Each case shall contain a packing list showing the detailed contents of the package. When any technical documents are supplied along with the shipment of materials no single package shall contain more than one set of such documents. Shipping papers shall clearly indicate in which packages the technical documents are contained. 4.4.11 The case number shall be written in the form of a fraction, the numerator of which is the serial number of the case and the denominator the total number of case in which a complete unit of equipment is packed. 4.4.12 Wherever necessary besides usual Inscriptions the cases shall bear special indication such as "Top", "Do not turn over", "Care", "Keep dry", etc., as well as indication of the center of gravity (with red vertical lines) and places for attaching slings (with chain marks). For all fragile equipment, unit should take special care to pack and label with additional markings such as " FRAGILE, HANDLE WITH CARE", "LIFTING POINTS", "THIS WAY UP", " DO NOT STACK" etc. to protect them from damage in transit. 4.4.13 Completeness of Contents of each packing case: Concerned CQA/Unit QC/Third Party Inspection Agency shall verify the completeness of contents of each package w.r.t. packing list both in terms of quality and quantity before authorizing dispatch of the consignment. Packing commensurate with international standards and accepted norms will be ensured by CQA/ Unit QC/Third Party Inspection Agency. Packing has to be sea-worthy and secure. As far as possible, the packing has to be rectangular in shape for optimum space utilization in the ship and economize on shipping costs. Projections on packages are prohibited.				
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स्वसाक्षिकार एवं गोपनीय इस प्रलेख में की गई सूचना भारत हेवी इलेक्ट्रिकल्स लिमिटेड की सम्पत्ति है इसका प्रयोग एवं प्रसारण अन्य से किसी भी तरह प्रयोग को बिना कम्पनी के लिखित में इतिहासक से न किया जाय।					
निम्नलिखित जानकारी SIGN & DATE					
मामूली सूची संख्या INVENTORY NO.	REV. NO. 02		निर्माणकर्ता WORKED BY	BRIJ LAL RAM	 23/03/18
P-5284			जांचकर्ता CHECKED BY	LAXMIKANT MISHRA	 23/03/18

निष्कासक/प्रमाणित SIGN & DATE		उत्पाद मानक (हीप : हरिद्वार)		ST33002							
		PRODUCT STANDARD (HEEP: HARIDWAR)		पृष्ठ 10 का 9 Page 9 of 10							
SUPERSEDES INVENTORY	सामग्री सूची नक़्का को अधिकृतित करना है	4.4.14 Completeness of Contents of each packing case: The packing list has to be checked and certified by the Inspection agency with due signatures. All packages shall be enclosed in suitable GI sheets on all sides. The top of box should be covered by GI sheet in single length & width. No loose items Gunny bag packing is allowed for shipment. 4.4.15 Provision of Inspection Windows on Packages: Vendors should provide inspection window of size 6" x 4" (glass perplex) for customs examination for all packages (above 1.5 x 1.5 x 1.5 cum) involving panels of any kind. Care would be taken to ensure that all packages are properly sealed to avoid ingress of moisture, rodents etc. Packing slip folders shall be attached outside with each box. 4.4.16 Provision of Humidity Indicator: - Humidity indicator must be provided in each packing boxes. Humidity indicator shall be placed behind inspection window or as far as practicable from the nearest unit of desiccant. - Use a three-spot paper card type 1x4 inches in size to show humidity with instruction as indicated in figure below. The spots indicate relative humidity of 50 percent, 40 percent and 30 percent, top to bottom, by changing color from blue to pink. HUMIDITY INDICATOR <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">EXAMINE ITEM IF PINK</td> <td style="border: 1px solid black; border-radius: 50%; width: 40px; text-align: center; padding: 5px;">50</td> </tr> <tr> <td style="padding: 5px;">CHANGE DESSICANT IF PINK</td> <td style="border: 1px solid black; border-radius: 50%; width: 40px; text-align: center; padding: 5px;">40</td> </tr> <tr> <td style="padding: 5px;">WARNING IF PINK</td> <td style="border: 1px solid black; border-radius: 50%; width: 40px; text-align: center; padding: 5px;">30</td> </tr> </table> 4.4.17 Marking for Safe Handling: To ensure safe handling, packing case shall be marked to show the following: - Upright position. - Sling position and Centre of Gravity position. - Storage category. Fragile components (to be marked properly with a clear warning for safe handling).				EXAMINE ITEM IF PINK	50	CHANGE DESSICANT IF PINK	40	WARNING IF PINK	30
EXAMINE ITEM IF PINK	50										
CHANGE DESSICANT IF PINK	40										
WARNING IF PINK	30										
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited It must not be used directly or indirectly in any way detrimental to the interest of the company		स्वत्वाधिकार एवं गोपनीय इस दस्तावेज में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स लिमिटेड की सम्पत्ति है इसका प्रयोग एवं प्रकाशन अन्य में किसी भी तरह प्रयोग ओ कि कम्पनी के हित में प्रतिकारक हो न किया जाय									
निष्कासक/प्रमाणित SIGN & DATE											
सामग्री सूची नक़्का INVENTORY NO.	REV. NO. 02		निर्माणकर्ता WORKED BY	BRIJ LAL RAM	23/03/18						
25284			जांचकर्ता CHECKED BY	LAXMIKANT MISHRA	23/03/18						

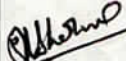
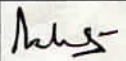
दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद मानक (हीप : हरिद्वार) PRODUCT STANDARD (HEEP: HARIDWAR)		ST33002 पृष्ठ 10 का 10 Page 10 of 10	
SUPERSEDES INVENTORY मासकी सूची संख्या को अपडेट किया गया है	4.4.18 Shipping Documentation including those covered by customs requirements: - Packing List (O&M manual to be listed in packing list, if sent along with consignment). - Fumigation certificate for wooden boxes 4.4.19 THE FOLLOWING DETAILS ARE TO BE MARKED ON THE PACKING CASES: - Address of consignee. - Purchase Order No. - Description of item or title of packing list. - Case identification Number. - Net Weight. - Gross Weight. - Dimensions of box - Marking showing upright position. - Marking showing umbrella (i.e. for machines/ components to be stored under covered storage).				
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company	MARKING ON PACKING BOXES  A  B  C  D  E A UPRIGHT B FRAGILE C PROTECTION FROM FALLING OR CONDENSING MOISTURE D SLING POSITION E PROTECTION FROM DIRECT RADIATION				
स्वत्वधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल लिमिटेड की संपत्ति है। इसका प्रयोग एवं प्रसारण अन्य में किसी भी तरह किया जाना है, बिना इस लिमिटेड की लिखित अनुमति के, हित में हानिकारक हो सकता है।	5.0 CROSS REFERED STANDARD: IS 3401-1992, BS 3482-1991, IS 6263-1972 & IEC 68-2-30:1980.				
दिनांक एवं हस्ताक्षर SIGN & DATE 					
मासकी सूची संख्या INVENTORY NO. P-5284	REV. NO. 02		निर्माणकर्ता WORKED BY BRIJ LAL RAM	BRIJ LAL RAM 	23/03/18
			जांचकर्ता CHECKED BY LAXMIKANT MISHRA		23/03/18

दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद मानक PRODUCT STANDARD	ST 48010 पृष्ठ 8 का 1 Page 1 of 8
सामग्री सूची संख्या को अंकित किया गया है	SUPERSEDES INVENTORY NO.	<u>PRESSURE/DIFFERENTIAL PRESSURE TRANSMITTER/ TRANSMITTER FOR FLOW (SMART TYPE)</u>	
1.0 SCOPE: This specification covers the technical requirements of Electronic Pressure Transmitter used for gauge pressure, absolute pressure, differential pressure and flow measurements. The transmitter shall be complete with sensing element, amplifier etc. To suit the input pressure, output signal range, power supply and other technical requirements.			
1.1 APPLICATION: It shall be suitable for power plant applications for steam water and oil services. The transmitter shall be of proven performance & highest reliability.			
1.2 DESIGNATION: A pressure transmitter to this standard of range 0-025 Kg/Cm2 and size no. 005 shall be designated as follows :			
<u>On Drawing</u>			
i) Drg. No. Column : ST 48010.007 ii) Description Column : Press. Transmitter 0-025 Kg/Cm2 iii) Material Specification column : ST 48010 iv) Material Code column : W97372651069			
<u>For placing Purchase Indents:</u> i) Pressure transmitter 0-025 Kg/Cm2. ST 48010.005			
2.0 COMPLIANCE WITH NATIONAL STANDARD: There is no Indian standard on the above subject. However assistance has been taken from BS6447 and data sheets of various Manufacturers.			
सामग्री सूची संख्या INVENTORY NO.	हस्ताक्षर एवं दिनांक SIGN & DATE	स्वत्वाधिकार एवं गोपनीय इस दस्तावेज में दी गई सूचना भारत के किसी इलेक्ट्रिकल को सम्पत्ति है इसका प्रयोग एवं प्रसारण रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए	
P-5731	23/8/03	TSX D.L. OBEROI QAX S.K. ARORA MEMBER P.S.C. N.R. DEY 21/8/03	
सहमत विभाग AGREED DEPTT.		नाम NAME दिनांक एवं हस्ताक्षर DATE & SIGNATURE	
GRIJ LAL RAM 29/03/22		अनुवादक TRANSLATED BY	
RAJ NISHU BAPTA 20/03/22		निर्माणकर्ता WORKED BY	
REV. NO. 05 Dt. 23/08/2022		जांचकर्ता CHECKED BY	
CHARGE ADVICE NO.- TSX(CIE)-22-120		पर्यवेक्षणकर्ता SUPERVISED BY	
APPROVED :  (B.K. BHALLA)		जारी ISSUED : TSX	
PREPARED : STE		दिनांक DATE : 20.8.88	

उत्पाद मानक PRODUCT STANDARD		ST 48010 पृष्ठ 8 का 2 Page 2 of 8	
3.0 TECHNICAL REQUIREMENTS 3.1 MEASURING PRINCIPLE : Variable capacitance or any other principle well proven for power plant application involving <u>electromagnetic noise</u> . Bidder shall furnish all details required to establish the provenness. 3.2 TYPE: The Transmitter shall be intelligent (SMART) two-wire type. It shall have the capability of remote ranging and self-diagnostics and shall be able to communicate digitally with a higher order control system through suitable interfaces. 3.3 OUTPUT: Linear 4-20mA D.C.with a superimposed digital signal. Digital signal shall be as per latest version of Highway Addressable Remote Transducer (HART) protocol. Digital communication with the transmitter shall in no way affect the analog output. 3.4 POWER SUPPLY: Transmitter shall be capable of operation at a dc voltage from +15 to +30 Volt. Load-voltage curve shall be furnished along with the offer. Minimum load shall be 600 ohm at 24 V DC 3.5 FIELD COMMUNICATOR: It shall be possible to diagnose, calibrate and adjust all transmitter parameters from a hand held field communicator and from a remote PC. The field communicator and the PC based configuration software shall be offered as an optional item. Field communicator shall be battery operated. 3.6 DIGITAL COMMUNICATION: Necessary Protocol and configuration details shall be furnished by the supplier, if desired by BHEL, to establish a digital link with BHEL's DDC system/ PC based configuration station. 3.7 LOCAL ADJUSTMENTS: Local span and zero adjustments shall also be provided. Which shall be lockable. 3.8 FLOW MEASUREMENT: If the requirement of Flow Transmitter is specified in the enquiry, The output shall be Square root extracted. 3.9 LOCAL INDICATOR: Transmitter shall have local digital indication		ST 48010 पृष्ठ 8 का 2 Page 2 of 8	
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REV. NO. 05		निर्माणकर्ता WORKED BY	
P-5731		S.K. SHARMA	
3/11/04		जांचकर्ता CHECKED BY	
3/11/04		K.B. BATRA	
3/11/04		Sd/-	
3/11/04		3.9.04	
3/11/04		3.9.04	

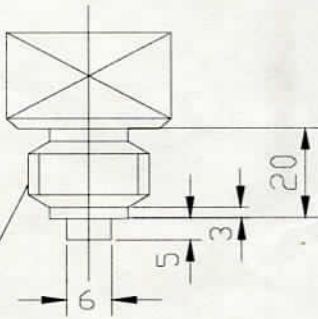
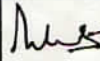
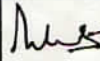
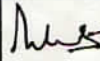
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SUPERSEDES INVENTORY NO. सामग्री सूची संख्या को अधिकारित करता है	4.0 PERFORMANCE SPECIFICATIONS: 4.1 ACCURACY: $\pm 0.075\%$ or better of calibrated span (inclusive of hysteresis, linearity & repeatability) at turn down ratio of 10:1 or less. (For Absolute Pressure Range $\pm 0.1\%$ or Better) 4.2 ENVIROMENTAL CONDITIONS: Ambient temp. : -20 to + 80° C. Storage temp. : -20 to +80° C. Humidity. : Continuous operation at RH of 95%. 4.3 DRIFT (LONG TERM): Less than $\pm 0.15\%$ of span in <u>three years</u> . (For Absolute Pressure Range Less than $\pm 0.1\%$ of span in one year) 4.4 SUPPLY VOLTAGE EFFECT. : Less than 0.005 % per volt. 4.5 TEMPERATURE EFFECT. : Less than $\pm 0.05\%$ of span per 100° C. 4.6 ZERO ELEV.AND SUPPRESS: Anywhere within the range limits maintaining minimum allowable span. 4.7 TURN ON TIME: Max. 10 sec after power is applied to the transmitter. 4.8 DAMPING: Min 0-16 second, selectable in steps. 4.9 VIBRATION EFFECT: $\pm 0.2\%$ of span per g at 200 Hz in any axis. 4.10 RESPONSE TIME: Transmitter response time (63 % as per BS6447) shall be <150 ms. This shall include the dead time. Response time for output to reach 1% of the final value shall also be informed by the supplier. 4.11 OVER RANGE PRESSURE: The Transmitter shall be capable of withstanding the over range pressure as given in BS 6447. 4.12 Transmitter shall be immune to interference from electromagnetic noise. When a 1V, 50 m Hz alternating voltage is superimposed on the o/p signal, the change in mean dc level of output current shall not exceed 0.1% of output span. 4.13 UPDATE TIME: Worst case output update time shall be 50 m sec. 4.14 MOUNTING POSITION EFFECT: Zero shift should be able to be calibrated out by zero adjustment.			
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company				
स्वत्वाधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत भारती इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रकाश एवं प्रसारण कप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए।				
हस्ताक्षर एवं दिनांक SIGN & DATE 				
सामग्री सूची संख्या INVENTORY P-5731	REV. NO. 0		निर्माणकर्ता WORKED BY S.K. SHARMA	Sd/- 8.9.04
			जांचकर्ता CHECKED BY K.B. BATRA	Sd/- 8.9.04

दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद मानक (हीप : हरिद्वार) PRODUCT STANDARD (HEEP: HARIDWAR)		ST48010 पृष्ठ 8 का 4 Page 4 Of 8	
SUPERSEDES INVENTORY सामग्री सूची संख्या को अपडेटिंग करना है	5.0 PHYSICAL SPECIFICATIONS: 5.1 HOUSING: Cast Aluminum Stoving enamel painted weather proof. 5.2 PROTECTION CLASS: IP 67 5.3 WETTED PARTS: SS 316 5.4 PROCESS CONNECTION: G 1/2" Male. In case an adopter is used to provide G 1/2" connection, it shall be factory fitted on the Transmitter. (REF.FIG.-1,SH-8). 5.5 FLANGE MATERIAL: SS (In case of DPT). 5.6 ELECTRICAL CONNECTION: Three Pin Plug receptacle connector (Amphetroneics/Allied make Or equivalent). Male part of the connector will be fixed with the Transmitter. 5.7 MOUNTING BRACKET: Transmitter shall be supplied with bracket for panel mounting along with Necessary fastners to mount the transmitter on the bracket. 04 Nos. mounting studs of size M10x70 With fine threads (material CS) shall be supplied for DPT and Flow transmitters only. 6.0 TURN DOWN RATIO: Minimum turn down ratio shall be 100:1 (for absolute pressure range minimum turn down ratio shall be 25:1). By using turndown ratio of the Transmitter, minimum variety of models shall be selected to cover all the ranges mentioned in the enquiry. It may be noted that specified accuracy is to be maintained for the calibrated rated range in each case. 7.0 IDENTIFICATION TAG: A blank stainless steel tag of size 60x20 mm shall be fastened with each Transmitter. 8.0 TESTS: Following tests shall be carried out by the supplier on each transmitter. 8.1 ROUTINE TESTS: a) Visual and dimensional check. b) Pressure range versus output signal test. c) Accuracy test. d) Test for adjustability of range. e) Process and electrical connection.				
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical. Limited It must not be used directly or indirectly in any way detrimental to the interest of the company					
स्वत्वाधिकार एवं गोपनीयता इस प्रलेख में दी गई सूचना भारत भारती एलेक्ट्रिकल्स लिमिटेड की सम्पत्ति है इसका प्रयोग एवं प्रसारण अन्य से किसी भी तरह प्रयोग को बिना कम्पनी के लिखित में हस्तिकाकारको न किया जाये।					
दिनांक एवं हस्ताक्षर SIGN & DATE					
सामग्री सूची संख्या INVENTORY NO.	REV. NO. 05		निर्माणकर्ता WORKED BY	BRIJ LAL RAM	 06.04.16
सामग्री सूची संख्या INVENTORY NO.	REV. NO.		जांचकर्ता CHECKED BY	MAYURI	 06.04.16

दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद मानक PRODUCT STANDARD		ST 48010 पृष्ठ 8 का 5 Page 5 of 8	
सामग्री सूची संख्या को अधिकृतित करता है SUPERSEDES INVENTORY	8.2 TYPE TESTS: IEC 60529 a). Enclosure protection as per A or equivalent national Standard. b). Test for performance characteristics as per specified in clauses 4.3,4.4,4.5,4.9,4.10,4.11,4.12. Method of tests shall be carried out as per BS 6447.				
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company	9.0 TEST CERTIFICATES: 9.1 3 copies of the tests certificate shall be furnished along with each transmitter giving following details: i) Name of instrument. ii) Name of manufacturer. iii) Serial no of the instrument. iv) Date of testing. v) BHEL PO NO. vi) Results of tests detailed in clause 8.0. 9.2 Certificate of compliance to specification ST48010.				
स्वत्वाधिकार एवं गोपनीय इस प्रलेख में की गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि: कम्पनी के हित में हानिकारक हो न किया जाए	10.0 GUARANTEE : A guarantee certificate of trouble free performance for 24 months from the date of shipment or 12 months from the date of commissioning, which ever is earlier, shall be furnished by the supplier. 11.0 DOCUMENTS: Data sheet (<u>Mentioning all the clauses 3.0 to 6.0</u>) of offered transmitters shall be furnished by the bidder for BHEL/Owner's approval. Two copies of detail technical literatures, operation and maintenance manuals shall be furnished with the offer . Complete technical literature is also to be furnished in " <u>SOFT FORM</u> " in a <u>CDROM</u> after placement of order.				
दिनांक एवं हस्ताक्षर SIGN & DATE 23/8/03	12.0 DEVIATIONS: Deviations from these specifications, if any, shall be clearly brought out in the offer.				
सामग्री सूची संख्या INVENTORY NO. P-5731	REV. NO. 05		निर्माणकर्ता WORKED BY	S.K. SHARMA	 21/8/03
			जांचकर्ता CHECKED BY	K.B. BATRA	 21-8-03

दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद मानक PRODUCT STANDARD		ST 48010	
				पृष्ठ 8 का 6 Page 6 of 8	
सामग्री सूची संख्या को INVENTORY NO.	SUPERSEDES INVENTORY NO.	13.0 PACKING : Each instrument with dehydrating agent shall be sealed individually in a polythene sheet and packed in a thermo Cole box. Such boxes shall be packed in a carton or case with adequate cushioning material to withstand transit risks without damage. 14.0 Supplier shall enclose the list of spare parts required for 3 years normal operation and quote for the same separately. 15.0 QUALITY PLAN: Detail quality plan for the tests and checks to be carried out during material induction, manufacturing and at final stage shall be submitted in BHEL's Format along with in house standard procedures/ norms for BHEL's approval. 16.0 MARKING : The following details shall be marked on the packing case. (a) Manufacturer's name or trademark. (b) B H E L order number. (c) BHEL standard NO. - ST48010. 17.0 NAME PLATE: Each instrument shall have a name plate with the Following details marked on it : (a) Manufacturer's name or trademark. (b) Type of the Instrument. (c) Model Number of the Manufacturer. (d) Maximum Range. (e) Calibrated Span. (f) Accuracy. 18.0 CROSS - REFFERED STANDARDS : (1) IEC 60529 (2) BS 6447			
सामग्री सूची संख्या INVENTORY NO.	स्वत्वाधिकार एवं गोपनीय The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company	दिनांक एवं हस्ताक्षर SIGN & DATE	दिनांक एवं हस्ताक्षर SIGN & DATE		
P-5731	23/8/03	REV. NO. 05	निर्माणकर्ता WORKED BY	S.K. SHARMA	21/8/03
P-5731	23/8/03	REV. NO. 05	जांचकर्ता CHECKED BY	K.B. BATRA	21.8.03

दिनांक एवं हस्ताक्षर SIGN & DATE	मो एम डी एल EEEL	उत्पाद मानक PRODUCT STANDARD		ST 48010 पृष्ठ 8 का 7 Page 7 of 8																																																																											
सामग्री सूची संख्या को अधिकृतित करता है	SUPERSEDES INVENTORY	A. <u>SIZE NO'S.</u> <table border="1"> <thead> <tr> <th>DESC.</th> <th>MEASURING RANGE KG/SQ.CM. OR BAR</th> <th>SIZE NO. IN CASE OF KG/SQ.CM.</th> <th>SIZE NO. IN CASE OF BAR</th> </tr> </thead> <tbody> <tr> <td rowspan="23">01. GAUGE PRESSURE</td> <td>0-250</td> <td>001</td> <td>051</td> </tr> <tr> <td>0-200</td> <td>002</td> <td>052</td> </tr> <tr> <td>0-060</td> <td>003</td> <td>053</td> </tr> <tr> <td>0-040</td> <td>004</td> <td>054</td> </tr> <tr> <td>0-025</td> <td>005</td> <td>055</td> </tr> <tr> <td>0-016</td> <td>006</td> <td>056</td> </tr> <tr> <td>0-010</td> <td>007</td> <td>057</td> </tr> <tr> <td>0-006</td> <td>008</td> <td>058</td> </tr> <tr> <td>0-004</td> <td>009</td> <td>059</td> </tr> <tr> <td>(-1)-(0)</td> <td>010</td> <td>060</td> </tr> <tr> <td>(-1)-(+3)</td> <td>011</td> <td>061</td> </tr> <tr> <td>(-1)-(+9)</td> <td>012</td> <td>062</td> </tr> <tr> <td>(-0.3)-(-1)</td> <td>013</td> <td>063</td> </tr> <tr> <td>0-100</td> <td>014</td> <td>064</td> </tr> <tr> <td>0-070</td> <td>015</td> <td>065</td> </tr> <tr> <td>0-050</td> <td>016</td> <td>066</td> </tr> <tr> <td>(-1)-(+15)</td> <td>017</td> <td>067</td> </tr> <tr> <td>(-1)-(+1.5)</td> <td>018</td> <td>068</td> </tr> <tr> <td>0-090</td> <td>019</td> <td>069</td> </tr> <tr> <td>0-400</td> <td>020</td> <td>070</td> </tr> <tr> <td>(-1)-(+80)</td> <td>021</td> <td>071</td> </tr> <tr> <td>(-1)-(+30)</td> <td>022</td> <td>072</td> </tr> <tr> <td>(-1)-(+10)</td> <td>023</td> <td>073</td> </tr> </tbody> </table>				DESC.	MEASURING RANGE KG/SQ.CM. OR BAR	SIZE NO. IN CASE OF KG/SQ.CM.	SIZE NO. IN CASE OF BAR	01. GAUGE PRESSURE	0-250	001	051	0-200	002	052	0-060	003	053	0-040	004	054	0-025	005	055	0-016	006	056	0-010	007	057	0-006	008	058	0-004	009	059	(-1)-(0)	010	060	(-1)-(+3)	011	061	(-1)-(+9)	012	062	(-0.3)-(-1)	013	063	0-100	014	064	0-070	015	065	0-050	016	066	(-1)-(+15)	017	067	(-1)-(+1.5)	018	068	0-090	019	069	0-400	020	070	(-1)-(+80)	021	071	(-1)-(+30)	022	072	(-1)-(+10)	023	073
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	0-050	016	066																																																																												
	(-1)-(+15)	017	067																																																																												
	(-1)-(+1.5)	018	068																																																																												
	0-090	019	069																																																																												
	0-400	020	070																																																																												
	(-1)-(+80)	021	071																																																																												
	(-1)-(+30)	022	072																																																																												
	(-1)-(+10)	023	073																																																																												
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दिनांक एवं हस्ताक्षर SIGN & DATE				उत्पाद मानक PRODUCT STANDARD		ST 48010																																																			
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FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm) FORM DG 39(B)

REV	DATE	ALTERED	BRIJ LAL	REV	DATE	ALTERED	BLR	CBOM No.		STATUS OF DRG	
02	05.08.26	CHECKED	ASHUTOSH SRIVASTAVA	01	10.04.25	CHECKED	ASHUTOSH	-----			
IN TABLE 2 NEW RANGE >420kg/cm ² ADDED, TECHNICAL REQUIREMENTS UPDATED. AS PE C/A NO. STE-26-F0116.				VAR. NO. 15 NEW ADDED AS PER CHANGE NO. STE-25-F0086.				AGREED DEPT.	NAME	SIGN	DATE
								----	----	----	
GRADE OF UNTOL.DIM.M/CGC/M/F.AA0230208				WELDING A/B/C/D AA0621104				GAS CUTTING-T3 AA0621101			

TABLE-1

VAR.NO.	DESCRIPTION	MAT. CODE NO	REMARK
00	PRESS. TRANSMITTER (0-80 BAR)	W97372652464	SIL2
01	PRESS. TRANSMITTER (0-16 BAR)	W97372652472	SIL2
02	PRESS. TRANSMITTER (-1) TO (+79)BAR	W97372652480	SIL2
03	DPT (-10) TO (+90) MBAR	W97372652499	SIL2
04	PRESS. TRANSMITTER 0-10BAR(ABS)	W97372652502	SIL2
05	PRESS. TRANSMITTER 0-1.3BAR,ABS	W97372652510	SIL2
06	FLOW TRANSMITTER 0-1800MBAR	W97372652529	SIL2
07	PRESS. TRANSMITTER (-1)TO(+3)BAR	W97372652537	SIL2
08	PRESS. TRANSMITTER (-1)TO(+9)BAR	W97372652545	SIL2
09	PRESS. TRANSMITTER (-1)TO(+39)BAR	W97372652553	SIL2
10	PRESS. TRANSMITTER (-1)TO(+19)BAR	W97372652561	SIL2
11	PRESS. TRANSMITTER 0-400 BAR	W97372652570	SIL2
12	PRESS. TRANSMITTER (-)1 TO (+399)BAR	W97372652588	SIL2
13	PRESS. TRANSMITTER (-) 1 TO(+50) BAR	W97372652596	SIL2
14	PRESS. TRANSMITTER 0-110 BAR	W97372652600	SIL2
15	PRESS. TRANSMITTER (-1) TO (+109) BAR	W97372652618	SIL2

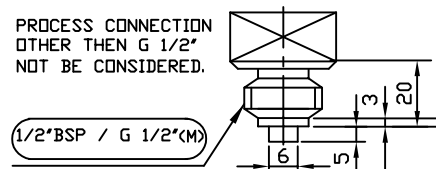
TABLE-2

RANGE	ACCURACY (FOR CALIBRATED RANGE)	TURNDOWN (FOR SPAN)	STABILITY (% OF CALIBRATED RANGE)
<=400mmwc	0.1%	20:1	+/-0.2% FOR 1 YEAR
>400mmwc	0.060%	50:1	+/-0.25% FOR 10 YEARS
>250kg/cm ²	0.065%	10:1	+/-0.15% FOR 5 YEARS
STATIC PRESSURE >420kg/cm ²	0.1%	10:1	+/-0.2% FOR 5 YEARS

TECHNICAL REQUIREMENTS:-

- 1 - BHEL MATERIAL CODE AS PER TABLE-1.
- 2 - ACCURACY, TURNDOWN AND STABILITY AS PER TABLE-2.
- 3 - SPECIFICATION NO. ST48010.
- 4 - OVER PRESSURE-150% OF CALIBRATED RANGE WITH NO OVER PRESSURE EFFECTS.
- 5 - BHEL / CUSTOMER APPROVAL REQUIRED ON COPY OF TYPE TEST.

PROCESS CONNECTION
OTHER THEN G 1/2"
NOT BE CONSIDERED.



BHARAT HEAVY ELECTRICALS LTD
HARDWAR

	NAME	SIGN	DATE	NO. OF VAR
DRN	SSTEBLR1	SSTEBLR1	01/02/2025	
CHD	SSTEAS2	SSTEAS2	01/02/2025	
APD	ASTEAS	ASTEAS	04/02/2025	

INVENTORY No.	DEPT.STE		SCALE	WEIGHT(Kg)	REF.TO ASSY.DRG.	ITEM No.	No OF ITEMS
	CODE 4011		N.T.S.	119	41337688101	--	--
TITLE				DRAWING No.			
PRESSURE TRANSMITTERS				41337688101			
				SHEET No.1 No.OF SHEETS1			

2x800 MW Singrauli (LIST OF PT/DPT/HHC)

Sl. No.	MATERIAL CODE	Type	RANGE	KKS TAG	MAIN QUANTITY PER UNIT	MAIN QTY IN 2 UNITS	MANDATORY SPARE QUANTITY	Total Qty
1	W97372652570	PT	0-400 bar	MAA12CP021	6	12	2	14
				LBA11CP004				
				LBA11CP005				
				LBA12CP004				
				LBA12CP005				
				MAA14CP021				
2	W97372652618	PT	-1 TO 109 bar	LBQ90CP001	1	2	1	3
3	W97372652464	PT	0-80 bar	LBB11CP004	8	16	2	18
				LBB11CP005				
				LBB12CP004				
				LBB12CP005				
				LBB21CP001				
				LBB21CP002				
				LBB22CP001				
				LBB22CP002				
4	W97372652472	PT	0-16 bar	LBG30CP011	3	6	1	7
				LBG30CP012				
				QFB01CP001				
5	W97372652588	PT	-1 TO 399 bar	MAA50CP001	3	6	1	7
				MAA50CP002				
				MAA50CP003				
6	W97372652480	PT	-1 TO 79 bar	LBC10CP001	5	10	1	11
				LBC10CP002				
				LBC10CP003				
				MAB50CP001				
				MAB50CP002				
7	W97372652596	PT	-1 TO 50 bar	MAN52CP011	2	4	1	5
				MAN55CP011				
8	W97372652553	PT	-1 TO 39 bar	LBQ70CP001	1	2	1	3
9	W97372652561	PT	-1 TO 19 bar	LBQ60CP001	2	4	1	5
				LBS50CP001				
10	W97372652545	PT	-1 TO 9 bar	LBS40CP001	1	2	1	3
11	W97372652537	PT	-1 TO 3 bar	LBS30CP001	1	2	1	3
12	W97372652502	Absolute PT	0-10 abs	MAC11CP001	3	6	1	7
				MAC11CP002				
				MAC11CP003				

Sl. No.	MATERIAL CODE	Type	RANGE	KKS TAG	MAIN QUANTITY PER UNIT	MAIN QTY IN 2 UNITS	MANDATORY SPARE QUANTITY	Total Qty
13	W97372652510	Absolute PT	0-1.3 barabs	MAG10CP002	10	20	2	22
				MAG10CP003				
				MAG10CP004				
				MAG10CP012				
				MAG10CP013				
				MAG20CP002				
				MAG20CP003				
				MAG20CP004				
				MAG20CP012				
				MAG20CP013				
14	W97372652529	Flow Transmitter	0-1800 mbar	MAN53CF001	6	12	2	14
				MAN53CF002				
				MAN53CF003				
				MAN56CF001				
				MAN56CF002				
				MAN56CF003				
15	W97372652499	DPT	-10 TO 90 mbar	MAW20CP001	2	4	1	5
				MAW20CP002				
16	W90313376050	HAND HELD COMMUNICATOR	-	-	1	2	0	2

NOTE: TAG PLATES SHOULD BE PUNCHED WITH THE KKS TAG GIVEN IN THE LIST. THE TAG NAME SHOULD BE INDELIABLE. TAG PLATE TO BE TIED ON THE TRANSMITTER WITH THE HELP OF A WIRE.

-sd-
Ahutosh Srivastava
Manager /CIE
25-09-26

-sd-
Sheetal Singh
Sr. Mgr/CIE
25-09-26

<u>1x800 MW Sipat and 1X800 MW Singreni (LIST OF PT/DPT/HHC)</u>							
Sl. No.	MATERIAL CODE	Type	RANGE	KKS TAG	MAIN QUANTITY IN 1X800 MW SIPAT	MAIN QUANTITY IN 1X800 MW SIPAT	TOTAL
1	W97372652570	PT	0-400 bar	MAA12CP021	6	6	12
				LBA11CP004			
				LBA11CP005			
				LBA12CP004			
				LBA12CP005			
				MAA14CP021			
2	W97372652618	PT	-1 TO 109 bar	LBQ90CP001	1	1	2
3	W97372652464	PT	0-80 bar	LBB11CP004	8	8	16
				LBB11CP005			
				LBB12CP004			
				LBB12CP005			
				LBB21CP001			
				LBB21CP002			
				LBB22CP001			
				LBB22CP002			
4	W97372652472	PT	0-16 bar	LBG30CP011	3	3	6
				LBG30CP012			
				QFB01CP001			
5	W97372652588	PT	-1 TO 399 bar	MAA50CP001	3	3	6
				MAA50CP002			
				MAA50CP003			
6	W97372652480	PT	-1 TO 79 bar	LBC10CP001	5	5	10
				LBC10CP002			
				LBC10CP003			
				MAB50CP001			
				MAB50CP002			
7	W97372652596	PT	-1 TO 50 bar	MAN52CP011	2	2	4
				MAN55CP011			
8	W97372652553	PT	-1 TO 39 bar	LBQ70CP001	1	1	2
9	W97372652561	PT	-1 TO 19 bar	LBQ60CP001	2	2	4
				LBS50CP001			
10	W97372652545	PT	-1 TO 9 bar	LBS40CP001	1	1	2
11	W97372652537	PT	-1 TO 3 bar	LBS30CP001	1	1	2
12	W97372652502	Absolute PT	0-10 abs	MAC11CP001	3	3	6
				MAC11CP002			
				MAC11CP003			

Sl. No.	MATERIAL CODE	Type	RANGE	KKS TAG	MAIN QUANTITY IN 1X800 MW SIPAT	MAIN QUANTITY IN 1X800 MW SIPAT	TOTAL
13	W97372652510	Absolute PT	0-1.3 barabs	MAG10CP002	10	10	20
				MAG10CP003			
				MAG10CP004			
				MAG10CP012			
				MAG10CP013			
				MAG20CP002			
				MAG20CP003			
				MAG20CP004			
				MAG20CP012			
				MAG20CP013			
14	W97372652529	Flow Transmitter	0-1800 mbar	MAN53CF001	6	6	12
				MAN53CF002			
				MAN53CF003			
				MAN56CF001			
				MAN56CF002			
15	W97372652499	DPT	-10 TO 90 mbar	MAW20CP001	2	2	4
				MAW20CP002			
16	W90313376050	HAND HELD COMMUNICA TOR	-	-	1	1	2

NOTE: TAG PLATES SHOULD BE PUNCHED WITH THE KKS TAG GIVEN IN THE LIST. THE TAG NAME SHOULD BE INDELIABLE. TAG PLATE TO BE TIED ON THE TRANSMITTER WITH THE HELP OF A WIRE.

Prepared by
-sd-
Ahutosh Srivastava
Manager /CIE

Checked by
-sd-
Sheetal Singh
Sr . Manager/ CIE

Approved by
-sd-
Sheetal Singh
Sr . Manager/ CIE



BHARAT HEAVY ELECTRICALS LIMITED, HARIDWAR

Control & Instrumentation Engineering (CIE)

ITEM – TURBINE PRESSURE/ DIFFERENTIAL/ FLOW TRANSMITTER

Addendum No-
CIE- CYBER SEC DATA PRIVACY - TURBINE
PRESSURE/ DIFFERENTIAL/ FLOW TRANSMITTER
REV 00
Date : 16/04/26

Undertaking is to be provided by the bidders for “Cyber security & Data privacy” as below along with offer:

1. It is certified that ICT- components are sourced from approved "Trusted Sources" to prevent cyber-attacks.
2. It is ensured to protect confidential data, unauthorized transmission of data outside the required boundary, is prohibited and it is ensured that there is no data loss.
3. It is certified that the supplied hardware/software contains no spyware, ransomware, virus, or hidden functionalities that could compromise security.
4. The Compliance with applicable international standards (e.g., ISO/IEC 27001, IEC 62443-4) and/or latest local Indian regulations (IT Act, CERT-In guidelines) will be ensured.
5. It is certified that our sub-contractors/ sub-supplier also comply with the same cybersecurity.

Worked by	Reviewed & Approved by
 16/04/26	 16/04/26
Ashutosh Srivastava/ Manager	Sheetal Singh / Sr. Manager

REV	DATE	ALTERED	REV	DATE	ALTERED	J.S.B.	GMS No/GRSP No.	STATUS
		CHECKED	01	20/9/06	CHECKED	S.K.S.	CBOM 31337622100	OF DRG
			CHANGE NO.			AGREED	NAME	SIGN
			STE-06-F0218			DEPT.		DATE

GRADE OF UNTOL.DIM.M/CGC/M/F.AA0230208 WELDING A/B/C/D AA0621104 GAS CUTTING-T3 AA0621101

HAND HELD COMMUNICATOR

HAND HELD COMMUNICATOR SHALL BE COMPATIBLE TO THE SMART TYPE TRANSMITTER WITH HART PROTOCOL. IT SHALL BE POSSIBLE TO CONNECT THE HHC ANY WHERE IN THE TRANSMITTER LOOP FOR CARRYING OUT THE FUNCTIONS AS DIFINED BELOW. CONNECTION OF HHC SHALL NOT DISTURB THE 4-20 mA SIGNAL ANYWAY.

- HHC SHALL BE UNIVERSAL TYPE WHICH CAN BE USED FOR ANY HART DEVICE AND APPROVED BY HART FOUNDATION. IT SHALL BE SUITABLE FOR LATEST VERSION OF HART PROTOCOL.
- HHC SHALL BE ABLE TO PERFORM THE FOLLOWING MINIMAM FUNCTIONS.
 - DEVICE SET UP.
 - DIAGNOSTIC MESSAGE DISPLAY.
 - PROCESS VALUE DISPLAY.
 - CHANGE OF ENGINEERING UNITS.
 - LOOP TESTING.
 - RANGE TESTING.
- POWER SOURCE : SUITABLE DC BATTERIES WITH CHARGER.
- KEY BOARD : AN ALPHANUMERIC KEY BOARD CONTAINING ALL REQUIRED FUNCTION KEYS.
- SUITABLE CONNECTORS AND CABLES SHALL BE SUPPLIED BY THE VENDER.
- OPERATING TEMPERATURE RANGE : 0 to 50 Deg /C
- STORAGE TEMPERATURE RANGE : 0 to 60 Deg /C
- ACCESSORY: CARRYING CASE.
- O & M MANUAL IN ENGLISH LANGUAGE TO BE FURNISHED WITH THE OFFER.

S1-29738 INVENTORY No.	16/03/1999 SIGN & DATE	REF.DRG.No.	001	HAND HELD COMMUNICATOR	W90313376050	0	50
			REMARKS	ITEM No.	DESCRIPTION	MATERIAL CODE	UNIT WT.
CARD TYPE 3		28	TYPE 1	28	CARD TYPE 2		
Bharat Heavy Electricals Ltd		HARDWAR		DRN	J. S. BHANDARI	-do-	15. 02. 1999
CHD		S.CHANDRA		-do-	15. 02. 1999	VAR	
APD		A. ALI		-do-	08. 03. 1999	73 74	
DEPT. STE	CODE 4011	SCALE	N. T. S.	WEIGHT(Kg)	0. 500	REF.TO ASSY.DRG.	31337622100
TITLE		HAND HELD COMMUNICATOR		DRAWING No.		41337622101	
				SHEET No. 01		No.OF SHEETS 01	

	CORPORATE QUALITY ASSURANCE SUB-VENDOR QUESTIONNAIRE
--	---

i.	Item/Scope of Sub-contracting			
ii.	Address of the registered office	Details of Contact Person (Name, Designation, Mobile, Email)		
iii.	Name and Address of the proposed Sub-vendor's works where item is being manufactured	Details of Contact Person: (Name, Designation, Mobile, Email)		
iv.	Annual Production Capacity for proposed item/scope of sub-contracting			
v.	Annual production for last 3 years for proposed item/scope of sub-contracting			
vi.	Details of proposed works			
1.	Year of establishment of present works			
2.	Year of commencement of manufacturing at above works			
3.	Details of change in Works address in past (if any)			
4.	Total Area			
	Covered Area			
5.	Factory Registration Certificate	Details attached at Annexure – F2.1		
6.	Design/ Research & development set-up (No. of manpower, their qualification, machines & tools employed etc.)	Applicable / Not applicable if manufacturing is as per Main Contractor/purchaser design) Details attached at Annexure – F2.2 (if applicable)		
7.	Overall organization Chart with Manpower Details (Design/Manufacturing/Quality etc)	Details attached at Annexure – F2.3		
8.	After sales service set up in India, in case of foreign sub-vendor (Location, Contact Person, Contact details etc.)	Applicable / Not applicable Details attached at Annexure – F2.4		
9.	Manufacturing process execution plan with flow chart indicating various stages of manufacturing from raw material to finished product including outsourced process, if any	Details attached at Annexure – F2.5		

	CORPORATE QUALITY ASSURANCE SUB-VENDOR QUESTIONNAIRE
--	---

10.	Quality Control exercised during receipt of raw material/BOI, in-process , Final Testing, packing	Details attached at Annexure – F2.6												
11.	Manufacturing facilities (List of machines, special process facilities, material handling etc.)	Details attached at Annexure – F2.7												
12.	Testing facilities (List of testing equipment)	Details attached at Annexure – F2.8												
13.	If manufacturing process involves fabrication then- List of qualified Welders List of qualified NDT personnel with area of specialization	Applicable / Not applicable Details attached at Annexure – F2.9 (if applicable)												
14.	List of out-sourced manufacturing processes with Sub-Vendors' names & addresses	Applicable / Not applicable Details attached at Annexure. –F2.10 (if applicable)												
15.	Supply reference list including recent supplies	Details attached at Annexure – F2.11 (as per format given below)												
	<table border="1" style="width: 100%;"> <tr> <th style="width: 10%;">Project/ package</th> <th style="width: 10%;">Customer Name</th> <th style="width: 30%;">Supplied Item (Type/Rating/Model /Capacity/Size etc)</th> <th style="width: 20%;">PO ref no/date</th> <th style="width: 20%;">Supplied Quantity</th> <th style="width: 10%;">Date of Supply</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	Project/ package	Customer Name	Supplied Item (Type/Rating/Model /Capacity/Size etc)	PO ref no/date	Supplied Quantity	Date of Supply							
Project/ package	Customer Name	Supplied Item (Type/Rating/Model /Capacity/Size etc)	PO ref no/date	Supplied Quantity	Date of Supply									
16.	Product satisfactory performance feedback letter/certificates/End User Feedback	Attached at annexure - F2.12												
17.	Summary of Type Test Report (Type Test Details, Report No, Agency, Date of testing) for the proposed product (similar or higher rating) Note:- Reports need not to be submitted	Applicable / Not applicable Details attached at Annexure – F2.13 (if applicable)												
18.	Statutory / mandatory certification for the proposed product	Applicable / Not applicable Details attached at Annexure – F2.14 (if applicable)												
19.	Copy of ISO 9001 certificate (if available)	Attached at Annexure – F2.15												
20.	Product technical catalogues for proposed item (if available)	Details attached at Annexure – F2.16												
<table border="1" style="width: 100%;"> <tr> <td style="width: 15%;">Name:</td> <td style="width: 30%;"> </td> <td style="width: 10%;">Desig:</td> <td style="width: 20%;"> </td> <td style="width: 10%;">Sign:</td> <td style="width: 15%;"> </td> <td style="width: 10%;">Date:</td> <td style="width: 10%;"> </td> </tr> </table>			Name:		Desig:		Sign:		Date:					
Name:		Desig:		Sign:		Date:								

Company's Seal/Stamp:-

**BHARAT HEAVY ELECTRICALS LIMITED, HARIDWAR**

Control & Instrumentation Engineering (CIE)

PRE-QUALIFICATION REQUIREMENT

Pressure Transmitters (Gauge PT/DPT) Specification: ST48010

Document No- CIE/PT/
/Turbine /20262235 R00
Date : 25/09/26

A. Indent No.: 20262235 Rev 00

B. Application: Pressure Transmitters (Gauge PT/DPT/ Abs PT) are required for various Pressure measurements in Thermal power plant

Sr. No.	PRE-QUALIFICATION REQUIREMENTS					VENDOR RESPONSE
1.	Bidder shall be the manufacturer or authorized supplier of OEM of Pressure Transmitters. Accordingly, any legal document or Letter of authorization shall be submitted respectively in support of this.					
2.	Bidder must have successfully supplied at least 100 or more pressure transmitters in last 7 years from date of enquiry. Bidder needs to furnish un-priced copy of purchase order (PO) in support of above and furnish data in following format.					
	(Project/ Customer Name)	PO ref no. & date	(Pressure Transmitter range)	Qty.	Contact details of customer (email and/or phone number, etc.)	
3.	Bidder to confirm that offered model series of transmitters have been successfully operational in Power plants/refineries/etc. for at least 1 year, in at least two projects. Bidder to submit Unpriced PO copies and supporting document (Performance Certificate, if BHEL PO is not available) in support of same. The supporting documents shall not be older than 7 years from date of enquiry.					
4.	Bidders who are supplying offered model series to BHEL Haridwar for the first time will have to provide extended warranty of 2 years over and above specification requirement. Bidder to confirm.					
5.	General technical requirements shall be as below. Bidder to confirm against each point: - <u>TECHNICAL REQUIREMENTS:-</u> a) Type of transmitter : SMART microprocessor based ,2 Wire 24V DC,+/-10% b) Sensor type : Capacitance/Inductive/Silicone resonance/ Piezo-resistive c) Output signal range : 4-20mA DC with digital communication (HART protocol) d) Accuracy : 0.060% of calibrated span e) Response time : <150 m Sec f) Protection : IP67 g) Local indication : Required h) Diagnostics : Self Indicating feature i) Wetted parts : SS316 j) Electrical connection : 3 Pin Plug Connector k) Process connection : G1/2 “ Male (Bottom entry)					
6.	Bidder to provide catalogue of offered items in support of technical specification along with addendum (if applicable).					
7.	Bidders will be required to submit Type test reports at the time of technical evaluation.					
8.	Bidders will be required to submit certification for SIL2, as applicable at the time of technical evaluation.					

Note: Bidder to confirm specific compliance wherever asked. BHEL reserves the right to verify information submitted by Bidder. In case the information is found false/ incorrect/ incomplete, the offer shall be rejected.

Worked by A. Srivastava/ Manager	Reviewed & Approved by Sheetal Singh / Sr. Manager
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MANUFACTURER'S NAME AND ADDRESS			STANDARD QUALITY PLAN				TO BE FILLED BY BHEL		TO BE FILLED BY BHEL					
BHEL	VENDOR'S NAME	ITEM	Pressure/ Differential Pressure/ Flow Transmitter	QP NO.	QA/BE/QP/902									
				REV.	12									
		DRG. NO.	AS PER PO											
		REV	AS per PO											
		SPEC.	AS per PO											
REV	AS per PO			Page 1 of 3										
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS		CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS		FORMAT OF RECORDS		AGENCY		REMARKS
										M	B	N		
1	2	3		4	5	6	7	8		9	D	10		11

1.00	RAW MATERIAL												
1.01	Diaphragm, Sensing, Housing & Process Connections (As applicable)	Grade of Material	Major	Chemical	1 Sample / lot	Ordering specn./ BHEL Appd Data Sheet	Ordering specn./ BHEL Appd Data Sheet	COC	√	P	V	-	
1.02	Flange & Wetting Part (As applicable)	Grade of Material	Major	Chemical	1 Sample / lot	Ordering specn./ BHEL Appd Data Sheet	Ordering specn./ BHEL Appd Data Sheet	COC	√	P	V	-	
1.03	Electronic & Other Components (As applicable)	Visual, Make, Range, Type / Model No., Sl. No. & Electric Connection (Plug & Socket Type)	Major	Visual	100%	Ordering specn. / Vendor STD	Ordering specn. / Vendor STD	Internal records	-	P	V	-	
2.00	IN-PROCESS INSPECTION												
2.01		Soundness of fitting, Connection & Terminal Marking	Major	Visual	100%	Ordering specn./ BHEL Appd Data Sheet	Ordering specn./ BHEL Appd Data Sheet	Internal records	-	P	-	-	
2.02		Insulation Resistance & Dielectric strength	Major	Electrical	100%	Ordering specn./ BHEL Appd Data Sheet	Ordering specn./ BHEL Appd Data Sheet	Internal records	-	P	-	-	
3.00	TYPE TESTS												NOTE-1
4.00	ROUTINE TESTS												NOTE-3
4.01		Visual (Input / Output Range, Make, Rating, Type / Model No./ Sl No.) & Dimensions	Major	Visual / Measurement	100%	Ordering specn./ BHEL Appd Data Sheet	Ordering specn./ BHEL Appd Data Sheet	Test Report*	√	P	W	-	

MANUFACTURER/SUBCONTRACTOR		LEGEND: ! RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER	FOR CUSTOMER USE	APPROVED BY 	Digitally signed by Sachin Jain Date: 2020.06.15 08:56:38 +05'30'

MANUFACTURER'S NAME AND ADDRESS			STANDARD QUALITY PLAN				TO BE FILLED BY BHEL		TO BE FILLED BY BHEL					
BHEL	VENDOR'S NAME	ITEM	Pressure/ Differential Pressure/ Flow Transmitter	QP NO.	QA/BE/QP/902									
				REV.	12									
		DRG. NO.	AS PER PO											
		REV	AS per PO											
		SPEC.	AS per PO											
REV	AS per PO			Page 2 of 3										
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS		CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS		FORMAT OF RECORDS		AGENCY		REMARKS
										M	B	N		
1	2	3		4	5	6	7	8		9	D	10		11

4.02		Mechanical Process Connections & Electrical Connections	Major	Visual / Measurement	100%	Ordering specn./ BHEL Appd Data Sheet	Ordering specn./ BHEL Appd Data Sheet	Test Report*	√	P	W	-	
4.03		Accuracy / Calibration Repeatability	Major	Electrical	100%	Ordering specn./ BHEL Appd Data Sheet	Ordering specn./ BHEL Appd Data Sheet	Test Report*	√	P	W	-	
4.04		Span and Zero Adjustability / Adjustability of Range	Major	Physical	100%	Ordering specn./ BHEL Appd Data Sheet	Ordering specn./ BHEL Appd Data Sheet	Test Report*	√	P	W	-	
4.06		Over Pressure Limit & Pressure Range versus Output Signal Test.	Major	Pressure	100%	Ordering specn./ BHEL Appd Data Sheet	Ordering specn./ BHEL Appd Data Sheet	Test Report*	√	P	W	-	
4.07		Power Supply Voltage Effect (As Applicable)	Major	Electrical	100%	Ordering specn./ BHEL Appd Data Sheet	Ordering specn./ BHEL Appd Data Sheet	Test Report*	√	P	W	-	
4.08		Insulation Resistance (If Applicable)	Major	Electrical	100%	Ordering specn./ BHEL Appd Data Sheet	Ordering specn./ BHEL Appd Data Sheet	Test Report*	√	P	W	-	
4.09	Completeness of TCs, COCs, & Inspection Reports		Major	Physical	100%	Ordering specn./ BHEL Appd Data Sheet	Ordering specn./ BHEL Appd Data Sheet	Documents	√	P	V	-	
5.00	IDENTIFICATION / MARKING & PACKING												
5.01		Identification Marking / Firmness of Tagging of Each Instrument	Major	Visual	100%	Ordering specn./ BHEL Appd Data Sheet	Ordering specn./ BHEL Appd Data Sheet	Internal Records		P	W	-	

MANUFACTURER/SUBCONTRACTOR		LEGEND:	FOR CUSTOMER USE	APPROVED BY		Digitally signed by Sachin Jain Date: 2020.06.15 08:56:54 +05'30'
		! RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION.				
		M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER				

MANUFACTURER'S NAME AND ADDRESS			STANDARD QUALITY PLAN				TO BE FILLED BY BHEL		TO BE FILLED BY BHEL				
BHEL	VENDOR'S NAME	ITEM	Pressure/ Differential Pressure/ Flow Transmitter		QP NO.	QA/BE/QP/902							
				REV.	12								
		DRG. NO.	AS PER PO										
		REV	AS per PO										
		SPEC.	AS per PO										
	REV	AS per PO		Page 3 of 3									
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY			REMARKS	
									M	B	N		
1	2	3	4	5	6	7	8	9	D	10		11	
5.02		Soundness of Packing Against Transit Damage	Major	Physical	100%	Ordering Specn./ BHEL Appd Data Sheet/ Vendor's STD	Ordering specn./ BHEL Appd Data Sheet	Internal Records		P	-	-	

Note:

1. Type tests clearance from BHEL Engineering to be verified by inspection engineer during inspection at vendor's works.
2. Manufacturer to maintain calibrated instruments having better accuracy than the item under the test. Inspection engineer shall check the same.
3. Witness by inspection agency to be random 10% of each material code(minimum 1 pieces per material code) from each lot. However vendor to carry out 100% tests internally and tests report shall be reviewed by inspection engineer during inspection at Vendor's works.
4. For material code having applicable spec ST48010, Transmitter shall be supplied with bracket for panel mounting along with necessary fasteners as per cl. no.-5.7 of BHEL spec. ST48010.

MANUFACTURER/SUBCONTRACTOR	LEGEND: ! RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER	FOR CUSTOMER USE	APPROVED BY

Digitally signed
by Sachin Jain
Date:
2020.06.15
08:57:10 +05'30'