

**Mandatory Pre-Qualification requirements for PRTD as per BHEL Specification-AA7322620**

**Description:**

The Two-wire duplex flat platinum resistance temperature detector is used in generator for Measurement of temperature of stator winding bars. The PRTD should be of very reliable and proven design for temperature measurement.

- 1.0** The vendor should be a regular manufacturer of such Two-wire duplex flat platinum resistance temperature detector) with minimum following requirements –

Si No.	Parameter	Value
(i)	Suitable Environment	Tropical, humid and dusty atmosphere
(ii)	Minimum dimension	150X10X2 mm
(iii)	Operating Temperature (Range)	0 C to 150 C
(iv)	Leads	Leads shall be of 10/0.193mm stranded copper with PTFE insulation. Insulated wire diameter shall not exceed 2mm.
(v)	Resistance element	Resistance value and tolerance Class-B as per IS 2848. The elements shall be non-inductively wound on a mica strip and suitably encapsulated using epoxy resin.
(vi)	Routine Test	As per IS:2848
(vii)	Type Test	As per IS:2848
(viii)	Pull Test	The leads shall be suitably brazed to the resistance element. Each lead shall withstand Pulling force of 5 kg when applied to each of the leads.

- 2.0** In support of above serial number-1, vendor shall furnish technical details of Two-wire duplex flat platinum resistance temperature detector in below mentioned format for at least one nos. (1) of the P.O. executed in past 10 years (from date of enquiry) along with P.O. copies.

S. No.	Brief technical details	Application	Name & address of customer	Date of supply
1	-Resistance Element -Routine Test -Type Test			

- 3.0** Vendor to furnish correlated test certificates against one of the P.O. submitted as per clause 2.
- 4.0** Vendor to furnish acceptance certificate from one of the end users of Two-wire duplex flat platinum resistance temperature detector against any one of the P.O. submitted as per

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clause 2. (Original Certificate or through e-mail directly from the customer). Acceptance certificate should contain information like item details and its application or correlation with P.O.

- 5.0 The vendor should have in-house manufacturing facilities for manufacturing of Two-wire duplex flat platinum resistance temperature detector. Vendor to furnish details of the manufacturing facilities available at their works along with photographs.
- 6.0 The vendor should have facilities for carrying out the following tests and provide details of test equipment available at their works.
- 1) Insulation Resistance Test
  - 2) High Voltage Test
  - 3) Resistance Accuracy Test
  - 4) Type Test
- 7.0 The testing facilities available at vendor's works should be duly calibrated against measurement standards traceable to national/international measurement standards. Vendor to confirm the same. Alternatively, vendor to indicate their tie-up with accredited laboratory for performing Type tests or agree to carry out at NABL/ILAC/APLAC approved lab and provide the details for the same.

**Note:** BHEL reserves the right to verify information submitted by vendor. In case the information is found to be false / incorrect, the offer shall be rejected.



# STANDARD QUALITY PLAN

Page 1 of 3

## LEGENDS:

P-PERFORMED BY 1-BHEL REP.  
W-WITNESS BY 2-VENDOR  
V-VERIFIED BY 3-SUB-VENDOR

QPNO : QA/BE/QP/908 REV.NO. : 07 DESCRIPTION: (MATERIAL, CLASS, GRADE, RATING, SIZE ETC): PLATINUM RESISTANCE TEMPERATURE DETECTORS & ASSEMBLIES WITH THERMOWELL  
SPECNO: As Per PO REV.NO. : --  
DRG : As Per PO REV.NO. : --

SL. NO.	COMPONENT/ OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY P W V	REMARKS
1	2	3	4	5	6	7	8	9	10 11 12	13
1.00	Raw Material									
1.01	Resistance Element	Material Grade, Type & Resistance Characteristics.	Major	Visual / Electrical	1 Sample / Lot	Ordering Specn / BHEL Appd Drawing.	Ordering Specn / BHEL Appd Drawing.	Test Report* / Internal Records*	2 - 1	
1.02	Cable for RTD	Continuity	Major	Electrical	1 Sample / Lot	Mfg. Specn	Mfg. Specn	Internal Record	2 - 1	If Applicable
1.03	Protecting Sheath, Terminal Head & Spring	Material Type / Grade	Major	Chemical / Physical	1 Sample / Lot	Ordering Specn / BHEL Appd Drawing.	Ordering Specn / BHEL Appd Drawing.	Test Report* / Internal Records*	2 - 1	
1.04	Extension Pipe & Thermowell	Chemical Analysis & Physical Properties	Major	Chemical / Physical	1 Sample / Lot	Ordering Specn / BHEL Appd Drawing.	Ordering Specn / BHEL Appd Drawing.	Test Report* / Internal Records*	2 - 1	
2.00	Fitting & Assembly	Soundness of Embedment / Fitting / Connections & Terminal Marking	Major	Physical	100%	Ordering Specn / BHEL Appd Drawing.	Ordering Specn / BHEL Appd Drawing.	Internal Records	2 - -	
3.00	Type Tests									Note: 3
4.00	Routine Tests									Note: 5
4.01		Visual and Dimensions	Major	Visual / Measurement	100%	Ordering Specn / BHEL Appd Drawing.	Ordering Specn / BHEL Appd Drawing.	Inspection Report*	2 1 -	
4.02		Resistance Accuracy	Major	Electrical	100%	Ordering Specn / BHEL Appd Drawing.	Ordering Specn / BHEL Appd Drawing.	Test Report*	2 1 -	
4.03		Pull out	Major	Physical	100%	Ordering Specn / BHEL Appd Drawing.	Ordering Specn / BHEL Appd Drawing.	Test Report*	2 1 -	Note: 2
4.04		Continuity	Major	Electrical	100%	Ordering Specn / BHEL Appd Drawing.	Ordering Specn / BHEL Appd Drawing.	Test Report*	2 1 -	
4.05		Insulation Resistance	Major	Electrical	100%	Ordering Specn / BHEL Appd Drawing.	Ordering Specn / BHEL Appd Drawing.	Test Report*	2 1 -	

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Page 2 of 3

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4.06		High Voltage	Major	Electrical	100%	Ordering Specn / BHEL Appd Drawing.	Ordering Specn / BHEL Appd Drawing.	Test Report*	2 1 -	Note: 2
4.07		Weld closure confirmity	Major	Mechanical	100%	Ordering Specn / BHEL Appd Drawing.	Ordering Specn / BHEL Appd Drawing.	Inspection Report*	2 1 -	If Applicable
4.08		Bore Concentricity & Dimensions of Thermowell incluncluding process connections.	Major	Measurement	100%	Ordering Specn / BHEL Appd Drawing.	Ordering Specn / BHEL Appd Drawing.	Inspection Report*	2 1 -	Note: 2 & BHEL Check Critical Dimensions
4.09		Easy Opening / Closing of Terminal Head Cover & Operating of Spring Loaded Insert ( Applicable for Terminal Head Type RTDs).	Major	Physical	100%	Ordering Specn / BHEL Appd Drawing.	Ordering Specn / BHEL Appd Drawing.	Inspection Report*	2 1 -	Note: 2
4.10		Hydraulic on Thermowell	Major	Hydraulic	100%	Ordering Specn / BHEL Appd Drawing.	Ordering Specn / BHEL Appd Drawing.	Test Report*	2 1 -	Note: 2
4.11		Compliance of Technical Requirements	Major	--	100%	Ordering Specn / BHEL Appd Drawing.	Ordering Specn / BHEL Appd Drawing.	COC*	2 - -	
4.12		Completeness of TCs, COCs, & Inspection Reports	Major	Physical	100%	Ordering Specn./ BHEL Appd Drawing / QP/ PO	Ordering Specn./ BHEL Appd Drawing / QP/ PO	Documents*	2 - 1	
5.00	Identification / Marking & Packing									
5.01		Identification Marking / Firmness of Tagging of Each Instrument	Major	Visual	100%	Ordering Specn.	Ordering Specn.	Internal Records	2 - 1	
5.02		Soundness of Packing Against Transit Damage	Major	Physical	100%	Ordering Specn./ Vendor's STD	Ordering Specn./ Vendor's STD	Internal Records	2 - -	

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Page 3 of 3

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## NOTE:-

1. Records as marked \* shall essentially be submitted by vendor as QA documentation package.
2. If applicable as per ordering specification, BHEL approved Drawing / BHEL Appd Data Sheet.
3. Type tests clearance from BHEL Engineering to be verified by inspection engineer during inspection at vendor's works.
4. Manufacturer to maintain calibrated instruments having better accuracy than the item under the test. Inspection engineer shall check the same.
5. 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.

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