

Mandatory Pre-Qualification requirements for P.T.Sensor for Header Nipple(RTD) as per BHEL specification TG60731 (Material code-W96413508612)

Description:

The P.T Sensor for Header Nipple(RTD) is used in generators for Measurement of temperature of water which is flowing in the stator winding bars. The P.T.Sensor for Header Nipple(RTD) should be of very reliable and proven design for temperature measurement.

- 1.0** The vendor should be a regular manufacturer of such P.T.Sensor for Header Nipple(RTD) with minimum following requirements –

Sl No.	Parameter	Value
(i)	Suitable Environment	Tropical, humid and dusty atmosphere
(ii)	Material of Square plate and enclosure for RTD Element	X6CrNiMoTi17122(1.4571)/SS321
(iii)	Operating Temperature (Range)	0 C to 150 C
(iv)	Leads	The leads shall be of 19/0.16mm stranded copper with poly- tetraflouroethylene Insulation (with min. radial thickness of 0.25mm).
(v)	Resistance element	Resistance value and tolerance as per IS 2848. The elements shall be wire wound type using insulated wire and suitably encapsulated in silicon alumina paste and epoxy resin
(vi)	HV Test	1.5 kV AC for 1 Min
(vii)	IR Test	Should not be less than 100M ohms when measured with 500VDC meggar at 20C
(viii)	Routine Test	Resistance Accuracy and IR test
(ix)	Type Test	As per IS:2848
(x)	Pull Test	The leads shall be suitably brazed to the resistance element. Each lead shall withstand Pulling force of 4 kg when applied to each of the leads.

**Mandatory Pre-Qualification requirements for P.T.Sensor for Header Nipple(RTD)
as per BHEL specification TG60731 (Material code-W96413508612)**

- 2.0 In support of above serial number-1, vendor shall furnish technical details of P.T.Sensor for Header Nipple(RTD) 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	Type of RTD Size of RTD-4X4X30 mm Max.			

- 3.0 Vendor to furnish correlated test certificates against the P.O. submitted as per clause 2.
- 4.0 Vendor to furnish acceptance certificate from the end users of P.T.Sensor for Header Nipple(RTD) against the P.O. submitted as per 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 P.T.Sensor for Header Nipple(RTD). Vendor to furnish details of the manufacturing facilities available at their works.
- 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
- 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 Routine/Type tests or agree to carry out at NABL/ILAC/APLAC approved lab and provide the details for the same.
- 8.0 Vendor shall confirm to meet all the technical requirements of Specification TG60731.

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.

**Mandatory Pre-Qualification requirements for PRTD as per BHEL specification
TG60734 (Material code- W96413508620)**

Description:

The four-wire duplex flat platinum resistance temperature detector is used in generators 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 four-wire duplex flat platinum resistance temperature detector) with minimum following requirements –

Sl No.	Parameter	Value
()	Suitable Environment	Tropical, humid and dusty atmosphere
(i)	Minimum dimension	150X10X2 mm
(ii)	Operating Temperature (Range)	0 C to 200 C
(v)	Leads	The leads shall be of 19/0.16mm stranded copper with poly- tetraflouroethylene Insulation (with min. radial thickness of 0.25mm)
(v)	Resistance element	Resistance value and tolerance class-A as per IS 2848. The wire wound resistance element shall be laid down in glass epoxy sheet in totally strain free manner. Empty space shall be filled with insulated powder.
(vi)	HV Test	2.5 kV AC for 3 Min
(vii)	IR Test	Should not be less than 100M ohms when measured with 100VDC meggar at 20C
(viii)	Routine Test	Resistance Accuracy and IR test
(ix)	Type Test	As per IS:2848
(x)	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.
(xi)	Compression load	Construction shall be such that it can bear compression load greater than 1 metric ton without any damage.

**Mandatory Pre-Qualification requirements for PRTD as per BHEL specification
TG60734 (Material code- W96413508620)**

- 2.0 In support of above serial number-1, vendor shall furnish technical details of four-wire duplex flat platinum resistance temperature detector in below mentioned format for at least one no. (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	Flat PRTD Size- 150X10X2 Min			

- 3.0 Vendor to furnish correlated test certificates against any one of the P.O. submitted as per clause 2.
- 4.0 Vendor to furnish acceptance certificate from one of the end users of four-wire duplex flat platinum resistance temperature detector against any one of the P.O. submitted as per 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 four-wire duplex flat platinum resistance temperature detector Vendor to furnish details of the manufacturing facilities available at their works.
- 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
- 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 Routine/Type tests or agree to carry out at NABL/ILAC/APLAC approved lab and provide the details for the same.
- 8.0 Vendor shall confirm to meet all the technical requirements of Specification TG60734.

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.

Mandatory Pre-Qualification requirements for RTD as per BHEL specification
(Material code-W96413509945, W96414500224, W96413500778, W90415302781,
W96414501557)

Description:

The Duplex platinum resistance temperature detector is used in generators and exciter for Measurement of temperature of air, gas and oil. The RTD should be of very reliable and proven design for temperature measurement.

- 1.0** The vendor should be a regular manufacturer of such RTD with minimum following requirements –

Sl No.	Parameter	Value
(i)	Suitable Environment	Tropical, dusty and humid atmosphere
(ii)	Terminal Block	Ceramic terminal block fixed with the help of spring-loaded screw
(iii)	Operating Temperature (Range)	0 C to 150 C (Min)
(iv)	Protective Sheath and Extension pipe	SS316 or equivalent
(v)	Resistance element	Resistance value and tolerance class-A as per IS 2848/IEC60751. Duplex non- inductive wire wound platinum resistance element.
(vi)	IR Test	Should not be less than 100M ohms at room temperature
(vii)	Routine and type Test	As per IS:2848/IEC 60751
(viii)	Terminal head	Die cast aluminum/light metal alloy with protection class-IP65
(ix)	Wires	Each of the two RTD elements shall consist of 2 PTFE insulated wires(min) which shall terminate on the terminal block.
(x)	Connection	Threaded connection for fitting into thermowell.

- 2.0** In support of above serial number-1, vendor shall furnish technical details RTD 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	Type of RTD			

- 3.0** Vendor to furnish correlated test certificates against the P.O. submitted as per clause 2.

**Mandatory Pre-Qualification requirements for RTD as per BHEL specification
(Material code-W96413509945, W96414500224, W96413500778, W90415302781,
W96414501557)**

- 4.0 Vendor to furnish acceptance certificate from the end users/proof of Payment of RTD against the P.O. submitted as per clause 2. 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 RTD. Vendor to furnish details of the manufacturing facilities available at their works.
- 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
- 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 Routine/Type tests or agree to carry out at NABL/ILAC/APLAC approved lab and provide the details for the same.
- 8.0 Vendor shall confirm to meet all the technical requirements of respective BHEL Specification and drawing.

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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STANDARD QUALITY PLAN

Page 2 of 3

LEGENDS:

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SPECNO: As Per PO REV.NO. : --
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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
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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STANDARD QUALITY PLAN

Page 3 of 3

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1	2	3	4	5	6	7	8	9	10 11 12	13

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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