



PLANT PURCHASE SPECIFICATION
JHANSI

PURCHASE SPECIFICATION
No. JS 22306

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DIGITAL WINDING TEMPERATURE SCANNER
(TRANSFORMER THERMAL PROTECTION RELAY)

1.0 General:

This specification governs the technical requirement of digital, programmable, microprocessor controlled winding temperature scanner along with 3 nos. PT-100 sensors.

2.0 Application:

The scanner shall be used for dry type transformers for temperature monitoring and thermal protection using inputs from PT-100 sensors embedded in the transformer winding.

3.0 Technical Requirements:

The scanner, with inputs from PT-100 sensors embedded in the transformer winding, shall be used for dry type transformers for local display (digital) of winding temperature, generation of 4-20 mA analog signal for remote indication/recorder, temperature based fan control and thermal protection from overheating of transformer by generation of alarm and trip signals using inbuilt relays. The scanner should also record maximum temperature attained by the windings. The settings of the scanner should be programmable i.e. the user must be able to change/modify various settings to the required values.

3.1 Operating Condition

Suitable for Ambient Temperature of 0 to 60 °C and Relative Humidity up to 95 %.

3.2 Operating Supply Voltage Range

90 to 260 V 50/60 Hz AC and 90 to 260 V DC

3.3 Input - Number of channels / Number of sensor inputs

4 nos. input/channels for PT-100 sensors or as specified in enquiry.

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3.4

Output

- Local digital display of temperature in Degree Celsius(°C) & Max temperature recording
- 4-20 mA analog output for 0 to 200 °C for remote indication/recorder.
- Relay contacts for fault condition
- Relay contacts for fan control
- Relay contacts for alarm signal
- Relay contacts for trip signal
- Any other additional relay / output if specified in enquiry.

3.5

Display

Seven segment ½ inch red LED display for displaying channel no. and temperature and fault condition.

3.6

Indications

LED indications should include to indicate/show –

- Mode of operation (Auto, Manual, Maximum, Programming/Function mode etc.)
- Fault condition (fault in supply, scanner, wiring, PT-100, out of range temperature etc.)
- Current status of various relays (Fault, Fan, Alarm, Trip etc.)

3.7

Accuracy:

± 1 °C or better

3.8

Resolution:

1 °C or better

3.9

Temperature Range

0 to 300 °C

3.10

Contact ratings

For Resistive load: 5 A (minimum) at 250 V AC, 0.3 A (minimum) at 125 V DC and at 220 V DC

For Inductive load L/R = 7 mSec: 5 A (minimum) at 250 V AC, 0.3 A (minimum) at 125 V DC and at 220 V DC

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3.11 Terminals:

Terminal Type: Screw Type suitable for 2.5 sq mm wire

Terminal numbers:

- PT-100 input – Terminal Nos. 1 to 12 for 4 channels
- Fault relay contacts – Terminal Nos. 13 to 15
- Alarm relay contacts – Terminal Nos. 16 to 18
- Trip relay contacts – Terminal Nos. 19 to 21
- Fan relay contacts – Terminal Nos. 22 to 24
- 4-20 mA analog output – Terminal Nos. 25 to 26
- Input Power Supply – Terminal Nos. 28 to 30

3.12 Insulation

3.12.1 Scanner:

Insulation Resistance (IR) value at ambient temperature – 20 MOhm (minimum) at 500 V between each terminal and earth.

Power frequency voltage withstand test – The scanner should withstand 2.5 KVrms at 50/60 Hz for 1 minute with voltage applied between all terminals shorted together and earth.

3.12.2 PT-100

Insulation Resistance (IR) value at ambient temperature – 20 MOhm (minimum) at 500 V with respect to earth.

Power frequency voltage withstand test – PT-100 should withstand 2.5 KVrms at 50/60 Hz for 1 minute with respect to earth.

3.13 Enclosure

Powder coated metallic enclosure with viewing glass and protection class of IP-52 or better shall be provided. Max/Enter and Set/Reset keys are to be duplicated on the front cover of enclosure.

3.14 Weight:

Weight shall furnished with the offer.

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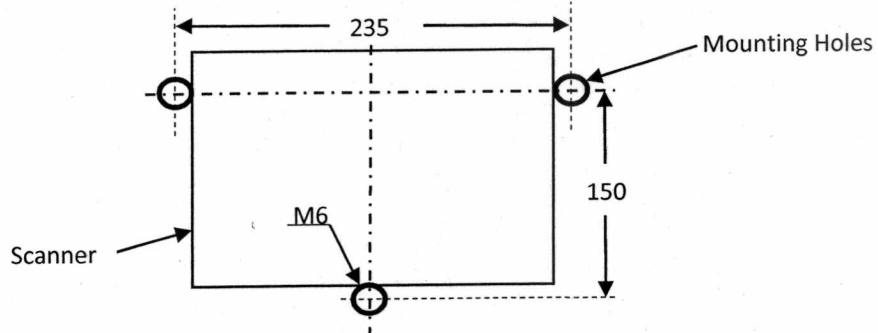
3.15 Power Consumption:

15 W (Max.)

3.16 Dimension

3.16.1 Max Overall Dimension – 215 (H) x 265 (W) x 130 (D). Drawings shall be submitted with the offer.

3.16.2 Mounting Dimension – Scanner should be suitable for mounting on the mounting hole configuration as shown in the sketch below with suitable hardware.



3.17 Setting Limit and Default Settings:

Setting limit and Default setting of parameters shall be as under unless specified otherwise in enquiry:

Sl.no	Parameter		Setting Limit	Default Value
01	Channel Status		On / Off	Channel 1, 2 & 3 On, Channel 4 off
02	Fan Relay	Set Point (°C)	1 – 300 °C	90 °C
		Differential (°C)	1 – 300 °C	8 °C
		Time Delay (sec)	1 – 60 sec	5 sec
03	High Temp. Relay (Alarm)	Set Point (°C)	1 – 300 °C	160 °C
		Differential (°C)	1 – 300 °C	4 °C
		Time Delay (sec)	1 – 60 sec	5 sec
04	Very High Temp. Relay (Trip)	Set Point (°C)	1 – 300 °C	180 °C
		Differential (°C)	1 – 300 °C	8 °C
		Time Delay (sec)	1 – 60 sec	7 sec
05	4-20 mA analog output	Channel output	Channel 1,2,3,4 or Max Temp.	Channel-2
		Temperature Range	-	0 – 200 °C
06	Display Speed		1 – 60 sec	4 sec
07	Maximum Temperature	Above Temp.	1 – 300 °C	1 °C
		In Steps of	1 – 20°C	Equal to resolution

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3.18 PT-100 Sensor

3 Nos., 3 wire Class-B, PT-100 sensors as per BHEL Spec TR25082T along with 1 mtrs. (minimum) connecting leads shall be supplied with the scanner. Out of 3 wires, 2 common wires shall be red and 1 wire shall be white.

4.0 Testing

4.1 Check of overall and mounting dimensions

4.2 Functional and operational check of fault, fan, alarm & trip relays.

4.3 Calibration of following component / setting to be carried out

- Calibration of all channels of scanner at different temperatures in steps of 50 °C in the range of operation (0 – 300 °C)
- All the relays at different temperatures in steps of 50 °C in the range of operation (0 – 300 °C)
- Calibration of 4-20 mA output at different temperatures in steps of 50 °C in the range of operation (0 – 200 °C)
- Calibration of maximum temperature display.
- PT-100 at different temperatures in steps of 50 °C in the range of operation

4.4 Insulation Resistance (IR) value at ambient temperature

4.4.1 Scanner:

20 MOhm (minimum) at 500 V between each terminal and earth.

4.4.2 PT-100

20 MOhm (minimum) at 500 V with respect to earth.

4.5 Power frequency voltage withstand test (High Voltage test/HV Test)

4.5.1 Scanner

Scanner should withstand 2.5 KVrms at 50/60 Hz for 1 minute with voltage applied between all terminals shorted together and earth.

4.5.2 PT-100

PT-100 should withstand 2.5 KVrms at 50/60 Hz for 1 minute with respect to earth.

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5.0 Test Certificate and Operation manual:

Unless otherwise stated on the order, three copies of test certificate shall be sent with each consignment. In addition, the supplier shall ensure one set of test certificate along with the dispatch. Operation manual shall be supplied for each scanner.

The test certificate shall bear the following information:

JS 22306 : Winding Temperature Scanner (Transformer thermal protection relay)

BHEL Order No. :

Batch No. / Lot N. :

Quantity:

Date of Manufacture:

Test values/results – Test Report including results of tests in line with Clause 4.0 above.

6.0 Packing and Marking:

The scanner shall be suitable packed to prevent damage during transit.

The package shall be indelibly marked with the following information:

BHEL Order No. :

JS 22306 : Winding Temperature Scanner (Transformer thermal protection relay)

Manufacturer's / Supplier's Name & Trade Mark:

Batch No. / Lot N. :

Quantity:

Date of Manufacture:

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