

	PRODUCT STANDARD HYDRO PROJECTS ENGINEERING	44154159056
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<u>PURCHASE SPECIFICATION OF</u> <u>12 POINTS TEMPERATURE SCANNER</u>		

1. DESCRIPTION:

12 Points temperature scanner is the chartless / paperless type recorder with 12 input channels. It indicates the real time measured temperature on coloured display screen and save / records the data in the memory. The input signals to the temperature scanner are connected from RTDs mounted in fields. Temperature scanner also provides the switching contacts for alarms indication.

2. APPLICATION:

12 Points temperature scanner shall be used for recording and displaying the temperature of Bearing Pads and Bearing Oil of Turbine Guide Bearing of Hydro Turbine. It provides the indication of the temperature, records the temperature and provides switching contacts for alarms.

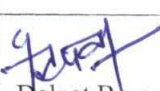
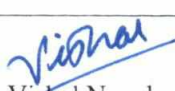
3. SCOPE OF SUPPLY:

Sr. No.	Item Description	Remarks
1	12 Points Temperature Scanner	For Quantities, please refer Annexure-A of specification no. 44154159056

4. SPECIFICATIONS:

4.1 INPUT SPECIFICATION:

- (i) No. of Measuring points : 12 (Twelve) Points.
for scanning
- (ii) Temperature Range : 0° C to 100° C.
- (iii) Input Signal : 3-Wire Platinum RTDs having a resistance of 100Ω at 0°C and 138.5Ω at 100°C.

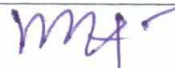
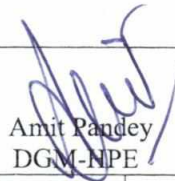
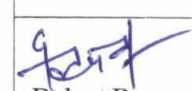
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Prepared			Prepared by  Yatendra Singh Dy. Mgr.-HPE	Checked by  Dalpat Borana Dy. Mgr.-HPE	 Vishal Namdeo Mgr.-HPE	Date of issue (Rev 00) 24.08.2020
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- | | | |
|--------|-------------------|--|
| (iv) | Range Setup | : Programming of input, types & ranges by keys. |
| (v) | Scale Setup | : Programming of maximum values, minimum values and engineering units by keys. |
| (vi) | Temperature Drift | : $\pm 0.01\%$ of full scale / $^{\circ}\text{C}$ |
| (vii) | Measuring Cycle | : 2 seconds / 12 points. |
| (viii) | Input Resolution | : About 1/56000 (converted into reference ranges) |
| (ix) | Burnout | : Detection of signal disconnection for resistance thermometer inputs. Up-scale burnout, down-scale burnout or burnout disabled should be selectable for each channel. |

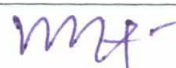
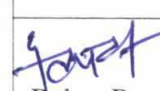
4.2 DISPLAY SPECIFICATION:

- | | | |
|-------|---------------------|--|
| (i) | Display | : 5.5" TFT color LCD |
| (ii) | Trend Display Color | : 10 colors (selectable) |
| (iii) | Operation Screens | : Screen should be switched by scroll key & entry key. |
- Max. 5 groups except alarm summary screen shall be switched & displayed. (Max. 6 Channels/group).
 - Trend screen (with scale plate & pointer displays). Selection from real-time trend, historical trend & dual trend screen.
 - Vertical or Horizontal time scale orientation should be selectable.
 - Data display enable or disable should be selectable and scrolling should be available. Zone recording should be possible.

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			 Amit Pandey DGM-HPE			
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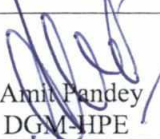
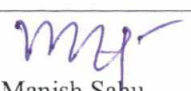
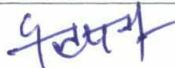
- Bar graph screen
Data display enable or disable should be selectable.
- Data screen
Data + Tag + Engineering Unit + Alarm activation status should be available.
- Multi screen
Real time trend screen + Bar graph screen + Data screen should be available.
- Alarm summary screen
Current alarm output status and alarm activation / reset log
(Channel, level, alarm activation / reset time)
- (iv) Skip function (Trend & Data Screen) : The channel to be skipped in display shall be programmed for each group.
- (v) Scroll function : Referring to historical data by the cursor should be enabled on the trend screen.
- Real time trend
- Historical trend
- Dual trend
- (vi) Display updating interval : Trend screen - min. 2 Secs.
Data screen - about 2 Secs.
- (vii) Time scale programming : Programs interval of displaying dots on the time scale shall be as follows:-
 - 2, 3, 5, 10, 15, 20, 30 Secs.
 - 1, 2, 3, 5, 10, 15, 20, 30, 60 Minutes.
- (viii) LCD saver : When no key is operated for the specified period of time the backlit should be dimmed and the screen saver display shall appear.
Programming period shall be 1 to 60 minutes.

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Approved					24.08.2020

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4.3 MEMORY FUNCTION:

- | | |
|----------------------------------|--|
| (i) Internal memory | : Not less than 128 MB |
| (ii) External memory | : CF memory card (Not less than 512 MB) |
| (iii) Storing interval | : 2, 3, 5, 10, 15, 20, 30 Secs.
1, 2, 3, 5, 10, 15, 20, 30, 60 Minutes. |
| (iv) Storing data | : Measured data
Alarm activation / reset
Programmed parameters
- Measured data
File number, storage start date/time, storage interval, scale data, measured data.
- Alarm activation / reset
Alarm activation / reset time , channel, level alarm type
- Programmed parameters
Storage date / time, all parameters |
| (v) Storage into internal memory | : Selection from the following by key shall be provided.
- Key operation.
- Trigger signal (Remote contacts, Alarm activation).
- Start / end by time.
: Pre-triggering storage shall be available for key operation and triggering signals.
- Pre-triggering measuring counts.
- The storage channel and storage interval shall be programmed for each file.
- Memory allocation enabled simultaneous-writing to multiple files shall be possible.
A file shall close when it has been fully written
(The storage to the specified file ends). |

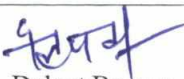
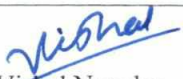
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Approved				 Vishal Namdeo Mgr.-HPE		

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- (vi) Status output : When 90% of the storage space in a file has been written, either bar graph showing the same should be available or the status shall be output at alarm output terminal.
- (vii) Memory usage display : The amount (%) of memory used in each file shall be displayed on the operational screens.

4.4 PROGRAMMING OPERATION:

- (i) Operator programming :
- : Message programming
 - : Channel parameters (Input ranges, others)
 - : Maths related parameters
 - : Alarm related parameters
 - : Date / time programming
- (ii) Engineering parameters programming :
- : Channel parameters (input ranges, others)
 - : Maths related parameters
 - : Alarm related parameters
 - : Date / time programming and date format selection
 - : Daylight savings time selection
 - : Password registration / cancellation
 - : Programming guidance language selection
 - : Screen saver related programming
 - : Screen brightness
 - : Display group registration (page switching. Max 6 channels / screen)
 - : Operation screen enable / disable registration
 - : Trend screen registration (Time scale vertical / horizontal direction, Black / white Screen color selection.

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- (iii) CF Memory card operation : Formatting
: Data file copy from internal memory
: Read /write of programmed parameters.

4.5 **ALARM SPECIFICATION:**

- (i) Alarm levels : **4 alarms (levels) / Channel**
(ii) Alarm type : High alarm, low alarm, differential high alarm, differential low alarm, rate of change increase alarm, rate of change of decrease alarm.
(iii) Alarm storage : Storage of alarm activation / reset time and alarm types
(iv) Alarm setting : AND / OR output should be possible
(v) Alarm output relay : **Relay contact output for alarm activation**
- **6 No. of output relay , NO-C-NC type**
- 240 VAC / 0.2 A resistive
- Fail output shall be programmed to alarm output terminals.

4.6 **OPTION: SCADA / DAS INPUT (COMMUNICATION INTERFACE)**

Ethernet (High order) + RS 485 (Low order) communication should be available for data transmission.

4.7 **GENERAL SPECIFICATION:**

- (i) Rated power supply : 240 V AC, 50/60 Hz
(ii) Power consumption : AS low as possible.
(iii) Power failure protection : Programmed parameters.
(Stored into EEPROM memory).
- Data stored into flash memory.
- Clock circuit and data sustained for minimum 6 years by a lithium battery (at the operation more than 8 hours/day)

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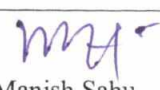
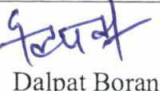
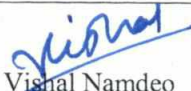
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- (iv) Mounting : Flush panel mounting.
(With minimum 2 nos. mounting brackets.)
- (v) Cut-out Dimension : 136.5 mm (W) x 136.5 mm(H)
- (vi) Provision that false alarms are not initiated for conditions. (a) RTD wires getting open circuited.
(b) RTD wires getting short circuited
- (vii) Appropriate measures should be taken to avoid effects of stray field on the temperature readings/ signals.
- (viii) Terminal Block : At the back of the recorder, miniature type terminal blocks shall be provided with identification labels for each 3-wire RTD input termination of 1.5 mm² each with a suitable transparent cover. The terminals for the common group alarm contact must be brought on the rear of the recorders for further connection with proper identification of groups. These also must be suitable for 1.5 mm² cable. Separate terminals for power supply input shall be provided at the back of scanner.

5. DOCUMENTS TO BE FURNISHED:

Along with the offer:

- (a) Catalogues giving all the technical particulars with model code along with decodification of mode code.
- (b) List of deviations, if any. Otherwise, it shall be understood that the vendor is meeting all the requirements specified by us.
- Vendor to note that if above documents are not furnished along with the offer; the offer shall be liable for outright rejection.

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After placement of order:

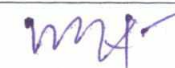
- Supplier has to submit the datasheet, drawing / catalog showing over all dimensions, mounting details and constructional details of temperature scanner for our approval within 3 weeks from the date of placement of PO.
- Supplier has to submit QAP for temperature scanner for our approval within 3 weeks from the date of placement of PO.

At the time of supply:

- 2 copies of test certificates / Calibration certificate and guarantee certificates to BHEL items. 1 copy of the above documents shall be put inside the case/ package.
- Shipping / packing lists of the 12 points temperature scanner.
- Installation, Commissioning, O & M Manual shall be supplied to BHEL, BHOPAL and one copy with instrument.

6. TEST CERTIFICATES:

- Calibration certificates issued by an ISO 17025 accredited certified Lab / Manufacturer calibration certificate / Test certificate for each temperature scanner are required.
- Following test shall be conducted on all instruments.
 - Visual Inspection
 - Satisfactory operation with Power Supply $230 \pm 20\%$ & $50 \text{ Hz} \pm 5\%$
 - Calibration from 0 to 150°C by varying input resistance.
 - Alarm contact operation tests.
 - Insulation resistance measurement with 500 V Megger
 - High voltage test at 1.0 KV AC RMS for one minute between power supply, contact & earth.

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7. INSPECTION & TESTING:

The inspection agency shall certify that the testing has been witnessed as per APPROVED Q.A. Acceptance or waiver of inspection does not absolve the supplier of his responsibility to rectify the instrument in case it does not perform satisfactorily at hydro site where it is actually used.

8. GUARANTEE:

The item must be guaranteed for trouble free operation, good workmanship for a period of 18 months from the date of dispatch.

9. PACKAGING:

Each temperature scanner shall be packed in individual carton with silica gel, adequate cushioning material and waterproof cover to avoid the movement of the internals and ensure that the instrument is capable of withstanding the transit conditions without damages.

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