



		<b>उत्पाद मानक</b> <b>PRODUCT STANDARD-HYDROGENERATOR</b> <b>MULTI POINT CHARTLESS TEMPERATURE RECORDER</b>	<b>HG-10048</b> <b>Rev.03</b> <b>पृष्ठ 4 का 1</b>	
गोपनीय एवं अधिकार सुरक्षित इस प्रणाली पर दी गई जानकारी भारत हेवी इलेक्ट्रिकल्स लिमिटेड की सम्पत्ति है इसे प्रत्यक्ष या अप्रत्यक्ष रूप से कम्पनी के हितों को नुकसान पहुंचाने के लिए कदापि उपयोग नहीं किया जावे	<p style="text-align: center;"><b>SPECIFICATIONS FOR MULTI POINT CHARTLESS RECORDER</b></p> <p><b>1.0 INTRODUCTION</b></p> <p>The specification for multipoint chartless temperature recorder is given in this document. The recorder will be used for on-line monitoring the temperatures of stator core/teeth/winding, hot/cold air, bearing pad/oil, cooling water of Hydro Generators &amp; Motors.</p> <p><b>2.0 SPECIFICATION</b></p> <p><b>2.1 Temperature Range :</b> 0° C to 150° C</p> <p><b>2.2 Accuracy:</b> ± 1° C throughout the scale</p> <p><b>2.3 Sensor:</b> 3-Wire Platinum RTDs having a resistance of 100 Ohm at 0° C and 138.5 Ohm at 100° C unless specified otherwise</p> <p><b>2.4 Resolution :</b> 1° C or better</p> <p><b>2.5 Recorder</b></p> <p><b>2.5.1 Type of Recorder:</b> Recorder shall be Chartless having draw-out or Modular Design.</p> <p><b>2.5.2 No of points for recording :</b> The number of points for recording shall be of 30 Points or as given in the enquiry / purchase order</p> <p><b>2.5.3 Display:</b> 10.4 Inch colour TFT display or equivalent with 640x480 dot color pixels and pre-calibrated for 0-150° C scale.</p> <p><b>2.5.3.1 Type of display :</b></p> <ul style="list-style-type: none"> <li>• Bar chart display.</li> <li>• Vertical display of bar chart and graph.</li> <li>• Horizontal display of bar chart and graph.</li> <li>• Digital display of bar chart and graph.</li> <li>• Cyclical display and recall display. Each channel trend line shall be identified by channel no. marker.</li> <li>• It shall be possible to setup display for each channel by User and allowing the displays to be customized to User's requirements. Change of color and screen saver be standard features.</li> </ul>			
<b>संशोधन : 03 Dated 26/07/2013</b>  Reviewed & Updated.  (A.K. PURE)  (M.G.SONI)		<b>हाइड्रोजनरेटर इंजीनियरिंग विभाग</b> <b>भारत हेवी इलेक्ट्रिकल्स लिमिटेड भोपाल</b>		
		<b>तैयारकर्ता</b> Sd/- A.D	<b>अनुमोदनकर्ता</b> Sd/- S.L	<b>जारी करने की दिनांक</b> 16/06/2004



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**PRODUCT STANDARD-HYDROGENERATOR**  
MULTI POINT CHARTLESS TEMPERATURE RECORDER

HG-10048  
Rev. 03

पृष्ठ 4 का 2

गोपनीय एवं अधिकार सुरक्षित इस प्रपत्रा पर दी गई जानकारी भारत हेवी इलेक्ट्रिकल्स लिमिटेड की सम्पत्ति है इसे प्रत्यक्ष या अप्रत्यक्ष रूप से कम्पनी के हितों को नुकसान पहुँचाने के लिए कदापि उपयोग नहीं किया जावे

**2.5.4 Type of Recording and Display :**

- Instant recording display.
- Adjustable facility for periodic channel number marking.
- Built-in Internal Flash Memory of minimum 5MB, with auto transfer of data to CF card of minimum capacity of 2 GB.
- Data download to compact flash memory card.
- Upload channel parameter file.
- Download channel parameter file.
- CD having Software to view and use data at any other PC.
- Total data from Internal & External Memory shall be viewed on recorder itself.

**2.6 Indicator:** Digital indication along with channel No indication.

**2.7 (a) Electrical contacts:** The number of contacts shall be minimum SIX or as given in enquiry/purchase order. The contacts shall be changeover type adjustable through out the temperature range. These contacts will be common for a group of channels as per annexure enclosed with enquiry / order. Electrical contacts shall be in-built with the instrument. **EXTERNALLY MOUNTED RELAYS ARE NOT ACCEPTABLE.**

**(b) Contact Rating:** The rating of contacts shall be 250 V, 50 Watts, DC resistive. There shall be two alarm settings for each channel.

**(c) Mounting: Totally** enclosed flush Panel mounted with proper supports to take recorder weight. Mounting Brackets, Lugs, screws, etc. shall be supplied with recorder.

**(d) Channel Skip :** The recorder shall be provided with skip facility to skip the recording of points which are faulty or not desired, in both Auto/Manual mode

**(e) Selection for Recording / Indication: Facility** shall be provided for selection of recording or indication or both.

**(f) Simultaneous Recording & Indication:** The indication and recording operation for a channel should be simultaneous.

**(g) Measuring Point Indication:** Facility shall be provided to indicate the channel number which is being recorded/indicated.

**(h) Hold facility:** Facility shall be provided to hold the recording temporarily at any point.

**(i) Mechanical Door Lock:** Recorder shall have provision for Mechanical Door Lock to avoid unauthorised access to external media and power supply switch.



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(j) **Communication interface:** Communication protocol through RS 422 / RS 485 (MODBUS Slave supported) shall be provided as input for SCADA / DAS system. Synchronisation function shall be through SNTP client server and recorder time shall be updated according to master clock.

(k) Additional Free consumables (Supplied with each Recorders) :

- 1 No. – 2GB (Minimum) CF card
- 5 Nos. – Fuses

**2.8 Working atmosphere:** Instrument shall be capable of running trouble free at an ambient temperature of 50 °C, Max. & 10 °C Min, 100% humidity and in a noise & vibration level of 100 db & 100 microns respectively.

**2.9 Panel Cutout dimensions:** The instrument shall be suitable for panel cutout size of 281 mm (W) x 281 mm (H).

**2.10 Maximum Overall Dimensions:** Maximum overall dimensions of the instrument shall be 288 mm (W) x 288 mm (H) x 236 mm (D).

**2.11 Power supply:** The instruments shall be suitable for 65 to 270 V, 50/60 Hz AC supply. For this Purpose, if necessary, SMPS shall be built into the instrument.

**2.12 Special provision :**

**2.12.1** There should be inherent provision inside the instrument such that false alarms are not initiated for following conditions:

- RTD wires getting open circuited.
- RTD wires getting short-circuited.

**2.12.2** In case of abnormal data like alarm and trip condition, Recorder should instantly display these parameters and warn the operator.

**2.12.3** Appropriate measures should be taken to avoid effects of stray field on the temperature readings / signals.

**2.12.4** Recorders shall be provided with Analogue to Digital (A/D) converter for channels with scan time not more than 2 seconds.

**2.13 Terminal Blocks:** At the back of the instrument miniature blocks shall be provided with identification labels, for 3-wire RTD input termination of 4 mm<sup>2</sup> cables each and provided with a suitable cover. The terminals for the common group alarm contact must be Brought on the rear of the instrument for further connection with proper identification of groups. These terminals also must be suitable for termination of 4 mm<sup>2</sup> cable. Separate terminals for power supply input shall be provided at the back of instrument.

**2.14 Channel Inscription:** The channel numbers with their corresponding inscriptions shall be engraved / printed on the front panel of the instrument as per details given in enquiry / order.



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**2.15 Type Approval:** Type approval for network communication (MODBUS Protocol) shall be carried out once in FIVE years, on sample recorder through BHEL (EDN, Bangalore) in the presence of HGE and copy of MOM / Report shall be enclosed with the quotation, otherwise offer will be rejected.

**2.16 Drawings:** The outline dimensional drawing giving panel cutout, bezel dimensions, mounting arrangement, internal wiring, schematic block diagram, weight, etc. as applicable shall be supplied within 4 weeks from the date of ordering.

**2.17 Packing:** Instrument shall be suitably packed for long-term storage in waterproof boxes to avoid transit / storage and sent assembled with mounting brackets, hardware, etc. as applicable.

**3.0 INSPECTION AND TESTING**

**3.1 Inspection:** The instrument will be inspected at supplier's works by BHEL /Third party / Customer prior to dispatch.

**3.2 Testing :** Following tests shall be conducted on all instruments

- Visual Inspection
- Satisfactory Operation with Power supply 65 to 270 V, 50/60 Hz single phase AC supply.
- Calibration from 0 °C to 150 °C by varying input resistance.
- Operation tests on alarm contacts.
- Function test to demonstrate the specification **clause no. 2** of this product standard.
- Measurement of insulation resistance with 500 V megger.
- High voltage test at 2.0 kV AC (RMS) for one minute between power supply / alarm contacts and earth.
- Test at Min. 300 Volts DC for channel isolation.

**4.0 SPECIAL CONDITIONS:** These shall be as per Annexure - CL.

STATUS OF REVISION

Rev. No.	Date of Rev.	Details of Revision	Revised by
01	23.12.2004	Reviewed & updated.	Sd/- J.K. Bhati
02	25.10.2007	Completely reviewed & updated.	K.V.Ajane & J.K.Bhati
03	26.07.2013	Reviewed & updated.	A.K.Pure & M.G.Soni