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SPECIFICATION FOR **CURRENT TRANSDUCER 1000A (1:4000)**

REVISION HISTORY SHEET

REV. NO	DATE	NATURE OF CHANGE	REASONS	PREPARED BY	APPROVED BY
00	25.07.2025	FIRST ISSUE		K. Hari HARI KALLURU	Dkp DKP

Approved: DEEPAK KUMAR PAYENG		
Prepared: K. Hari Hari Kalluru	Issued: SAE/406	Date: 25/07/2025

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Introduction: BHEL EDN is manufacturing LOCO & EMU Traction Converters and Hotel Load converters for Indian Railways. This current transducer is used in IGBT power module for measurement of current which is required for control and protection purpose. Following are general specification of current transducers used in power modules.

Description: Closed loop current transducer using Hall effect 1000A

1. Requirements:

1.1	Primary nominal rms Current (I_{PN})	: 1000 A
1.2	Primary current measuring range @ ±24 V (I_{PM})	: 0 ... ±2400A
1.3	Measuring resistance with +/-24V @±2000 A ($R_{M\ min}$)	: ≤ 5 ohms
1.4	Measuring resistance with +/-24V @±2000 A ($R_{M\ max}$)	: ≥ 15 ohms
1.5	Conversion ratio (K)	: 1:4000
1.6	Secondary nominal rms output @ I_{PN} (I_{SN})	: 250mA
1.7	Supply voltage (+/-5%)	: +/-15V to +/-24V
1.8	Current consumption @+/-24V	: ≤ 32+ I_{SN} mA
1.9	Measuring accuracy @ I_{PN}, T_A = 25°C	: ≤ +/-0.5%
1.10	Linearity	: ≤ 0.1%
1.11	Offset Current @ I_{PN} =0, T_A = 25°C	: ≤ +/-0.5 mA
1.12	Response time 90% of Ipn (with di/dt of 100 A/us)	: ≤ 1 µS
1.13	Frequency bandwidth	: DC .. 100 KHz
1.14	Operating temperature range	: -40°C to +85°C
1.15	Creepage distance	: 64 mm (min.)
1.16	Clearance distance	: 45 mm (min.)
1.17	Dielectric strength b/w Pri. to Output terminals (50 Hz, 1 min)	: 12kV (min.)

2. Standards for reference:

EN 50155 Railway applications electronics equipment used on rolling stock
EN 50121-3-2 EMC: Emissions to external environments
IEC60077 Rules for equipment for onboard rail vehicles
IEC 60571 Rules for electronic equipment onboard rail vehicles
IEC 62498-1 Railway applications - Environmental conditions for equipment
IEC-61373 Electric Railway Equipment-Rolling Stock-Shock & Vibrations Requirement
IEC61287 Railway applications-Power converters installed on rolling stock
IEC61376 Creepage and clearance

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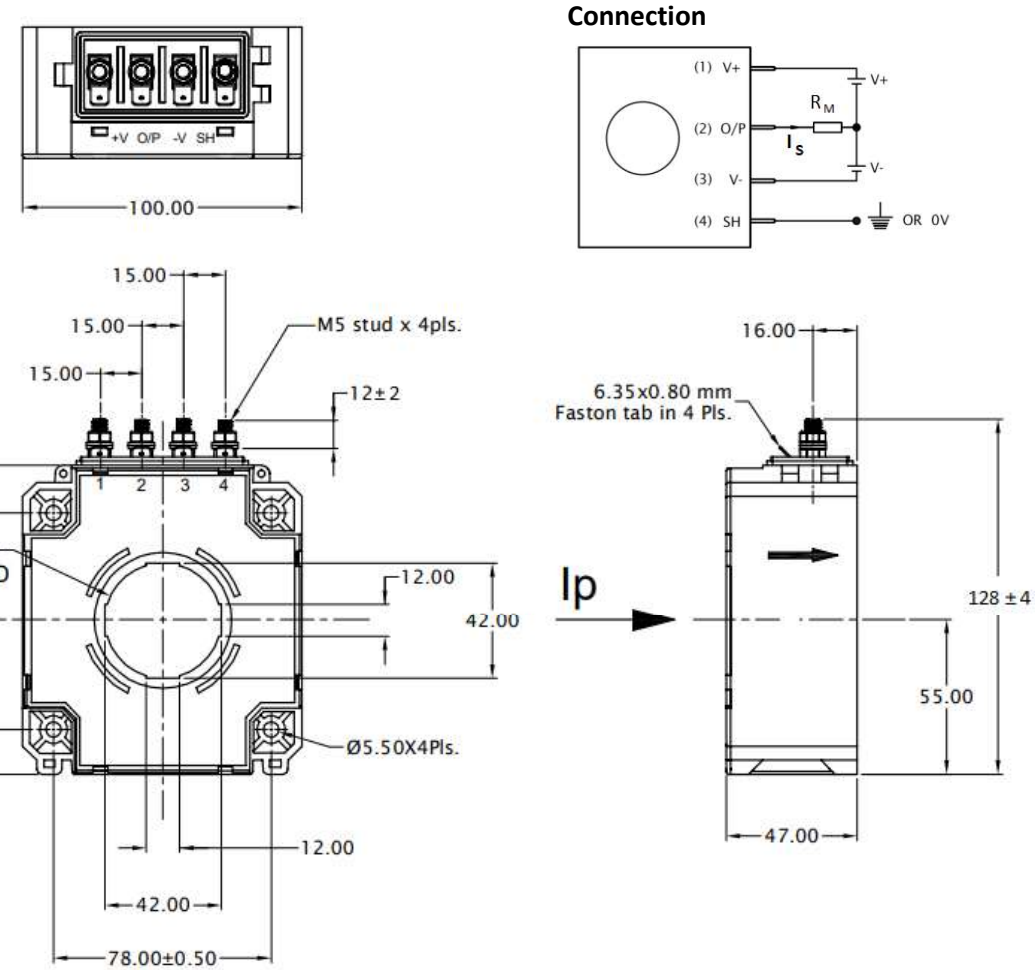
3. ENVIRONMENTALCONDITIONS:

3.1 Ambient Temperature	: 55°C
3.2 Maximum Temperature	: 70°C (when locomotive standing dead under sun) 55°C (when locomotive working)
3.3 Humidity	: 100% during rainy season
3.4 Rain fall	: Very heavy in certain areas
3.5 Atmosphere during hot weather	: Extremely dusty and desert terrain in certain areas. The dust concentration in air may reach a high value of l.6mg/cub meter.
3.6 Air Pollution	: The equipment will be designed to work in coastal areas in humid and salt laden atmosphere
3.7 Vibration	: The equipment, sub system and their mounting arrangements will be designed to withstand vibrations and shocks encountered in service as specified in corresponding IEC publications unless otherwise prescribed.

4. Mechanical dimensions (For reference):

Connection



All dimensions are in mm

5. TESTS:

5.1 Type Tests:

Type tests to be conducted by the vendor for current transducer as per relevant IEC standard in government approved labs / NABL accredited labs and test results shall be submitted to BHEL.

5.2 Routine test:

Routine tests shall be carried out by the manufacturer on every transducer before delivery and routine test certificate shall be submitted.

6. DOCUMENTATION

6.1 Information required along with techno commercial offer without which offer is liable for Rejection.

6.1.1 Supplier shall furnish clause wise confirmation/comments to the technical specification. Deviation, if any, shall be clearly brought out indicating the clause number, original specification, deviation sought with proper technical backup (catalogue, technical brochure, international standards, calculations etc. If no deviations required, then supplier shall furnish certificate indicating "NO DEVIATIONS REQUESTED" and we comply fully with all the technical requirements of this specification.

6.1.2 Dimensional drawing confirming to clause no. 4 of this specification and Datasheet.

6.2 Information required after receipt of the PO

6.2.1 Complete datasheet including dimensional drawing for approval of BHEL.

6.2.2 Supplier to submit the successful type tested report. Supplier to start manufacturing of RFQ quantity after receipt of manufacturing clearance from BHEL based on successful type tested report.

6.3 Information required along with material supply

6.3.1 Type tested reports (for first transducer) for the tests as per clause 5.

6.3.2 Routine Test certificates for the tests as per clause 5 on all transducers.

7.Packing:

Item shall be packed in a manner suitable for delivery and storage at the appointed delivery address. Transport packaging will provide adequate protection against accidental damage during normal handling. Terminals, leads, mounting brackets etc. will be protected from mechanical damage.

8. Acceptance criteria:

Routine / type test report

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