

Technical Specification

Traction Current Sensors TCS1000-465

Features :

- High accuracy
- Very good linearity
- Easy installation
- Can be customized
- Low temperature drift
- High immunity to external interference
- Robust Design for Harsh Environments
- High Galvanic Isolation



The TCS1000 current sensor is specifically designed for demanding railway applications, providing accurate and reliable measurement of both alternating current (AC) and direct current (DC) up to 1000A.

Key Features:

- **Measurement Range:** Nominal current of 1000A, capable of measuring both AC and DC currents.
- **Galvanic Isolation:** High galvanic isolation between the primary and secondary circuits, ensuring optimal safety and protection in high-voltage environments.
- **Railway Applications:** Ideal for traction systems and energy conversion in railway infrastructure, where reliability and precision are critical.
- **High Accuracy:** Designed to deliver precise measurements even in electrically noisy environments.
- **Durability:** Built to withstand harsh railway environments with robust and long-lasting construction.

This sensor is the perfect solution for applications where safety, reliability, and accuracy are of paramount importance.

Application Domains:

- Railway
- Industrial

Standards :

- IEC60950-1:2001
- EN50178:1981
- EN50155:2021
- EN60947-1:2004
- EN61373

Applications :

Variable speed drives
Welding machine
Battery supplied applications
Uninterruptible Power Supplies
Electrochemical.
Substations.
Auxiliary converters

Part Number	Primary Nominal Voltage	Primary Voltage Measuring Range
TCS1000-465	1000A	±2400A

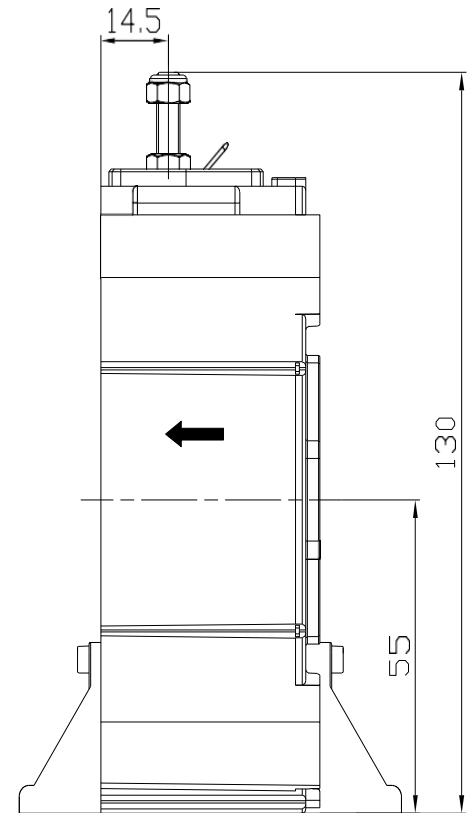
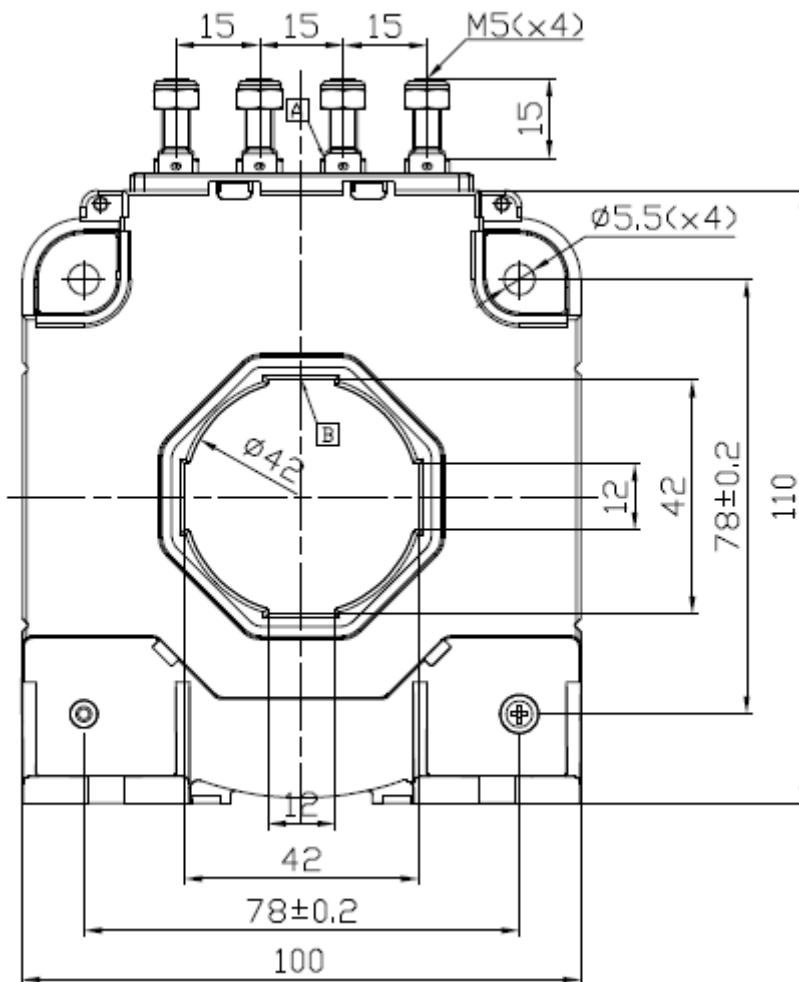
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Specifications: $T_A = +25^{\circ}\text{C}$, $V_{CC} = \pm 15\text{V}$

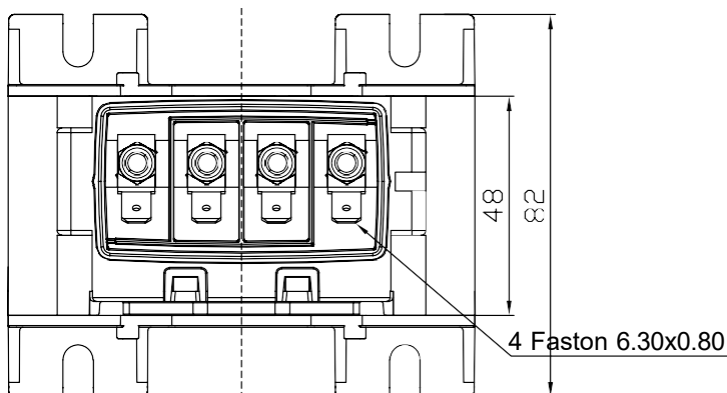
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Primary nominal r.m.s Current	IPN		-	1000	-	A
Primary Current measuring range	IP		-2400	-	+2400	A
Output current RMS	ISN			200		mA
Turns ratio NP/Ns	T		1/5000			
Secondary coil resistance	RS	@ $\pm 15\text{V}$		45		Ω
Inside resistance	RM		$R_{Mmax} = N_s \frac{V_{Cmin} - 0.5V}{I_P} - R_{Smax} - 1.1 \Omega$			Ω
Supply voltage	VC	$\pm 5\%$	± 15		± 24	V
Current consumption	IC			$< 32 + I_s$		mA
Accuracy	XG	@IPN, $T=25^{\circ}\text{C}$		$< \pm 0.4$		%
Offset current	IOE	@IPN, $T=25^{\circ}\text{C}$		$< \pm 0.5$		mA
Temperature variation of IOE	IoT	@IP=0, $-40 \sim +85^{\circ}\text{C}$		$< \pm 0.5$		mA/ $^{\circ}\text{C}$
Linearity error	ϵ_r			< 0.1		%
Di/dt				> 100		A/ μs
Response time	TD	@90% of IPN		< 1.0		μs
Bandwidth	BW	@ -1dB, IPN	DC	100		KHz
Dielectric strength For AC insulation	Vd	@50/60 Hz, 1min		13.4		KV
Operating temperature	TA		-50	-	+85	$^{\circ}\text{C}$
Storage temperature	TS		-55	-	+90	$^{\circ}\text{C}$
Mass	M			460		g
Plastic material		PBT G30/G15, UL94- V0				

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DIMENSIONS :



REP	d _{CI}	d _{CP}
A - B	45.90mm	66.70mm



General tolerance: $< \pm 0.5\text{mm}$

Primary through-hole : $\varnothing 42\text{mm}$

Recommend fastening torque: 2.2N.m

Connection of secondary 4 Faston 45°
: 6.3 × 0.8 m

Transducer fastening 4 notches $\varnothing 5.5\text{mm}$
4 M5 steel screws

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1. General Safety Warnings

- **Intended Use:** This transducer is designed for installation in electrical and electronic systems. It must be used in compliance with applicable international standards, such as **IEC 61010-1**, as well as local regulations and codes.
- **Applicable Standards:** The transducer must be operated according to the Adisens's operating instructions to ensure compliance with relevant safety standards, including:
 - **IEC 61010-1:** Safety requirements for electrical equipment for measurement, control, and laboratory use.
 - **EN 50178:** Safety requirements for electronic equipment for power installations.
- **Installation by Qualified Personnel:** Only qualified professionals, trained in handling high-voltage systems and electrical components, should install, commission, and maintain the transducer. Misuse or incorrect installation may result in electric shock, fire, or severe equipment damage.

2. Electrical Shock Risk

- **Risk of Electric Shock:** This transducer operates in high-voltage environments. It must be handled with care to avoid direct contact with live electrical components. There is a risk of serious injury or death from electric shock if proper precautions are not taken.
- **Limited-Energy Secondary Circuits:** To ensure safe operation, this transducer must be used exclusively within limited-energy secondary circuits, as specified by **IEC 61010-1**, which governs the safe design of electrical circuits to reduce the risk of injury and electrical hazards.
- **Isolation Requirements:** This transducer provides galvanic isolation between the primary (high-power) and secondary (low-power) circuits. However, the device should not be assumed to provide absolute protection against electric shock. Always de-energize circuits before installation or maintenance.

3. Installation Precautions

- **Environmental Conditions:** The transducer is designed to operate in controlled environments. Ensure that the operating temperature, humidity, and surrounding conditions comply with the transducer's specifications provided in the technical datasheet. Avoid exposure to moisture, corrosive environments, or areas prone to electrical interference.
- **Mounting:** Secure the transducer properly in a location that prevents movement or vibration during operation. Improper mounting may cause electrical arcing or contact with live components.
- **Grounding:** Ensure that the transducer is correctly grounded in accordance with the electrical system design. This will help prevent electric shock and improve system safety and performance.

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4. Operational Guidelines

- **Operating Limits:** Operate the transducer strictly within the specified voltage, current, and temperature ranges. Overloading the transducer beyond its rated capacity may result in equipment failure or create safety hazards.
- **Routine Maintenance:** Inspect the transducer regularly for signs of wear, damage, or abnormal operation. Discontinue use if any issues are detected and consult the manufacturer for replacement or repair.

5. Handling and Storage

- **Handling Precautions:** Avoid direct contact with transducer terminals during handling. Always handle the device with protective gear, including insulated gloves, to avoid accidental electric shock.
- **Storage Conditions:** Store the transducer in a clean, dry, and temperature-controlled environment. Prolonged exposure to harsh conditions may degrade performance and compromise safety.

6. Emergency Procedures

- **Power Disconnection:** In case of a malfunction, electrical fault, or other emergency, immediately disconnect the power supply to the transducer and seek professional assistance for inspection and repair.
- **First Aid:** If an electric shock occurs, follow established first aid protocols and seek emergency medical assistance immediately.

7. Disposal

- **Environmental Considerations:** Dispose of the transducer according to local regulations for electronic waste. Do not incinerate, and avoid disposing of the device in general waste, as it may contain hazardous materials.

8. Manufacturer's Support

For additional information, technical support, or to report any issues with the transducer, please contact us on contact@adisens.fr. Ensure that you have the model number, serial number, and installation details on hand for a prompt response.