

Current Sensor

RCM14-01 Series

Residual Current Monitor • Mode 3 • 12 V dc



REACH



Description

The RCM14-01 residual current monitor is designed to detect dc residual currents in 50 Hz / 60 Hz ac installations. It is primarily used in Mode 3 Electric Vehicle charging stations to disconnect the power supply in the event of a dc residual fault current, enhancing safety and compliance. Additionally, it can be applied in dc, single-phase, or multiphase installations for broader monitoring needs.

This compact, panel-mounted device features a convenient JST connector for easy installation and is fully compliant with the detection requirements of IEC 62955.

Features & Benefits

FEATURES	BENEFITS
JST XH 2.5 mm Pitch Connector JST:B4B-XH-A (LF)(SN)	Provides easy installation
LED Indication for "On" and "Fault"	At-a-glance function and fault indication
Large 14 mm ID	Flexibility to support single or 3-phase supply cables

Applications

- Mode 3 EV Charging Stations

Ordering Information

CATALOG #	DESCRIPTION
90106	12 V dc residual current monitor

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Specifications

Relevant Product Standard	IEC 62955
Rated Residual Current (I_{Δn})	6 mA dc
Rated Non-operating Residual Current (I_{Δno})	3 mA dc
Response Time to residual current fault (time between appearance of fault to output going high)	According to IEC 62955
DC Supply Voltage (V_{cc})	12 V dc ± 10%
Supply current (no fault present @24 V)	2 mA maximum
Supply current (fault current > 200 mA @24 V)	14.5 mA maximum
Rated Load Current - Amps (The RCM14 modules can accommodate single phase loads up to 100 A or three-phase loads up to 40 A)	100 A single-phase 40 A three-phase
Test Function (Externally applied 12 V dc) - Test Current Limit	0.8 mA dc maximum
Fault Signal Output	Active High Open Drain
Drain Current	100 mA maximum
Pull up Voltage	+26.4 V dc maximum
Environmental Operating Conditions Absolute Temperature	-40 °C to +85 °C
Weight	45 g
Recommended screw type	M3 x 6 (2 pcs.)
Conditional Residual Short-circuit Current	10 kA
Surge Current Withstand	3000 A

Environmental Conditions

PARAMETER	MIN.	TYP.	MAX.	UNIT
Operating temperature	-40	-	85	°C
Storage temperature	-40	-	85	°C
Altitude	-	-	3000	m

Electrical Specifications

PARAMETER	MIN.	TYP.	MAX.	UNIT
Supply voltage, V _{cc}	10.8	12	13.2	V
Supply current with no fault current ¹	-	-	2	mA
Supply current, peak > 200 mA dc fault current ¹	-	-	14.5	mA
DC trip threshold	3	-	6	mA
Fault Out drain current	-	-	100	mA
Fault Out pull up voltage	-	-	24	V
Test input current @12V	-	0.8	-	mA
Rated load current, 1 phase / 3 phase ²	-	-	125	A

¹Output external pull up current not included.

²At rated current, the absolute maximum temperature of the conductors through the CT must not exceed 105 °C.

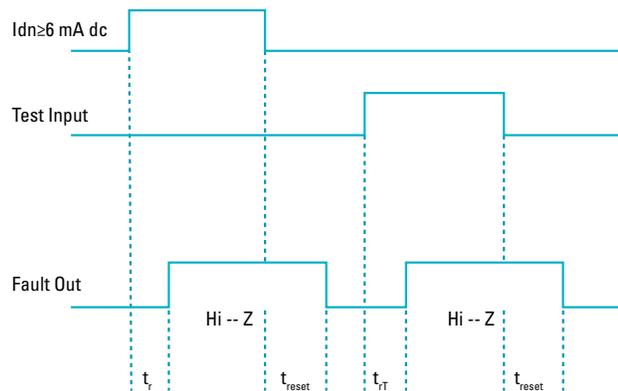
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Timing Specifications

PARAMETER	MIN.	TYP.	MAX.	UNIT
Fault Out response time @ 6 mA dc $t_{r(6mA)}$	10.8	12/24	2500	ms
Fault Out reset time ³ t_{reset}	-	-	2600	ms
Fault Out response time with test) t_{rT}	-	-	1200	ms
Fault Out reset time with test ³ t_{resetT}	3	-	1400	ms
Maximum switching time of external switching device including processing time	-	-	20	ms

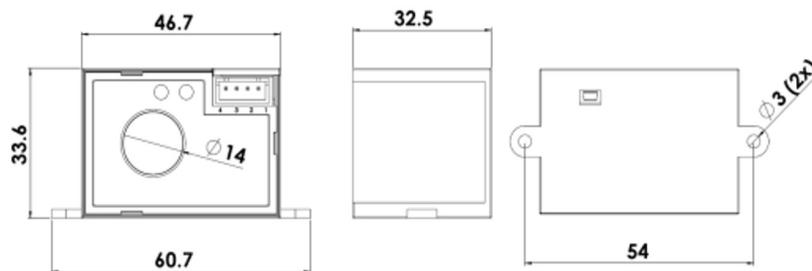
³Time taken for Fault out to return from Hi-Z state after fault removed.



Other

PARAMETER	MIN.	TYP.	MAX.	UNIT
Overvoltage category		III		-
ESD Human body model		TBD		kV
IP Rating		IP20		-

Dimensional Drawings (Millimeters)



Handling Instructions

Care should be taken to ensure the correct connection of the RCM14-01. Miswiring the product may cause permanent damage.

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Wiring Diagrams

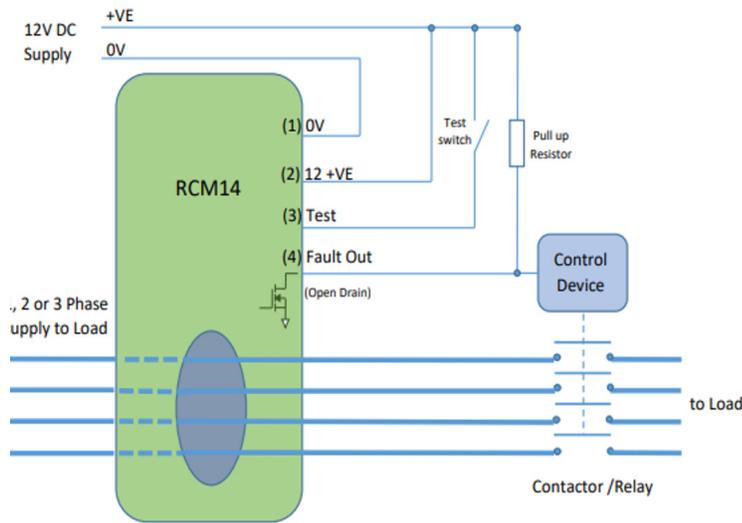


Figure 1. RCM14 Product Connections

PIN NO.	NAME	DESCRIPTION
1	0 V dc	Ground
2	+12 V dc	<p>Power Supply Input: Requires 12 V dc $\pm 10\%$ for proper operation. The 'ON' LED will illuminate green when voltage is present. Performance may be affected if the supply voltage falls outside this range.</p>
3	External Test	<p>Test Function: To verify correct device positioning, apply +VE (e.g., 12 V dc) to the test input. When activated, Pin 4 (Fault Out) goes HIGH if the test passes. Once +VE is removed, Fault Out returns to LOW. The test input should remain disconnected when not in use. Activation can be done via a test switch or a control device.</p>
4	Fault Signal Output (Active High Open Drain)	<p>Open-drain output requiring an external pull-up resistor to the desired signal level (e.g., +VE).</p> <p>*LOW State (low impedance): Indicates no fault and test function inactive. 'FAULT' LED is off.</p> <p>*HIGH State (high impedance): Triggered when residual fault current exceeds 6 mA or test function is active. 'FAULT' LED lights red.</p> <p>*The pin resets to LOW once the fault is cleared and test is inactive, turning off the LED. *To prevent contactor/relay chatter, do not connect this pin directly to such devices. *Use hardware or software latching in the control system to capture fault signals reliably.</p>

Note:

RCM14 product connector:

JST XH 2.5mm Pitch Connector: B4B-XH-A (LF)(SN)

Recommended Mating connector: The mating connector is assembled from a housing and 4 x crimps with suitable wires.

Recommended Mating connector housing: JST XHP-4

Recommended Crimps: JST SXH-001T-P0.6

Pre-crimped wires are also available from JST for ease of assembly.

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Standards Conformity & Certifications

Product Safety Certifications

Products tested, compliant and certified to the following standards that states the requirements for electrical products to ensure they are safe for consumers to use.

CERTIFICATION BODY MARK	CERTIFICATION BODY NAME	CERTIFICATION DESCRIPTION	STANDARDS COVERED BY THE CERTIFICATION
	IEC	Conformity with the European safety, health, and environmental protection requirements for residual direct current detecting device (RDC-DD) to be used for mode 3 charging of electric vehicles.	IEC 62955

Environmental Compliance

Products comply to the following environmental standard requirements for electrical products to ensure they are safe for consumers to use.

-	STANDARD NAME	STANDARD DESCRIPTION	STANDARD NUMBER
	RoHS	Conformity with the European Restriction of Hazardous Substances in electrical and electronic products.	European Union RoHS 2 Directive 2011/65/EU
	REACH	Conformity with the Registration, Evaluation, Authorization and Restriction of Chemicals regulation to ensure safe use of chemicals.	European Directive 1907/2006

Intended Use

The RCM20-01 is designed to be integrated with the appropriate switching device, e.g. relay or contactor, to provide the 6 mA dc detection requirements defined by IEC 62955 for use in Mode 3 electric vehicle charging.

No special start-up procedures or calibration is required for the RCM20-01. Once powered the system is ready to detect residual faults to IEC 62955.

Related Products

RCM01-01: 6 mA dc Detection to IEC 62955, 9 mm CT Aperture

RCM14-03: 6 mA dc / 30 mA ac Detection to IEC 62752, 14 mm CT Aperture

RCM14-04: 56 mA dc / 20 mA ac Detection to UL 2231, 14 mm CT Aperture

RCM20-01: 6 mA dc Detection to IEC 62955, 20 mm CT Aperture

RCM14-01 System: 6 mA dc Detection to IEC 62955, 14 mm CT Aperture, PCB Mount Sensor Board + CT

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