Current Sensor
RCM20-01 Series

Residual Current Monitor • Mode 3 • 12-24 V dc

IEC RoHS REACH

Description

The RCM20-01 detects dc residual currents in 50 Hz / 60 Hz ac installations. It is primarily designed for Mode 3 EV charging stations to disconnect power during a dc fault condition.

It also supports dc, single-phase, and multiphase installations. Compact and panel-mounted, the RCM20-01 features a JST connector for easy integration and complies with IEC 62955 detection requirements.

Features & Benefits

FEATURES	BENEFITS
JST XH 2.5 mm Pitch Connector JST:B4B-XH-A (LF)(SN)	Provides easy installation
"Fault" Signal Output	Offloads fault detection from the main control system, simplifying and reducing development time
Large 20 mm ID Aperture	Flexibility to support single or multi-phase supply cables

Applications

- Mode 3 EV Charging Stations

Ordering Information

CATALOG #	DESCRIPTION
90122	12 to 24 V dc residual current monitor

Revised: 11/12/2025

Specifications

Relevant Product Standard	IEC 62955
Rated Residual Operating Current (IΔn)	6 mA dc
Rated Non-operating Residual Current (IΔno)	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 (Vcc) **Supply current (no fault present @24 V)** **Supply current (fault current >200 mA @24 V)**	12 to 24 V dc ± 10% 4.2 mA maximum 13 mA maximum
Rated Load Current (single or three-phase)	125 A maximum (the absolute maximum temperature of the conductors through the CT must not exceed 105 °C)
Test Current limit for 12 – 24 V externally applied to Test Input	0.8 mA dc maximum
Fault Signal Output **Drain Current** **Pull up Voltage**	Active High Open Drain 100 mA maximum +26.4 V dc maximum
Environmental Operating Conditions Absolute Temperature	-40 °C to +85 °C
Weight	37 g
Recommended screw type	M3 x 6 (2 pcs.)
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, Vcc	10.8	12/24	26.4	V
Supply current with no fault current @ 24 V[1]	-	-	4.2	mA
Supply current, peak >200 mA DC fault current @ 24 V[1]	-	-	13	mA
dc trip threshold	3	-	6	mA
Fault Out drain current	-	-	100	mA
Fault Out pull up voltage	-	-	26.4	V
Test input current @12 V Test input current @ 24 V	-	0.35 0.70		mA
Rated load current, 1 phase / 3 phase[2]	-	-	125	A

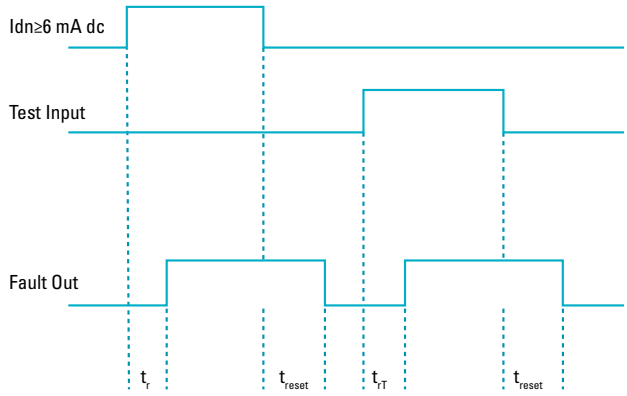
[1]Output external pull up current not included.

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

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

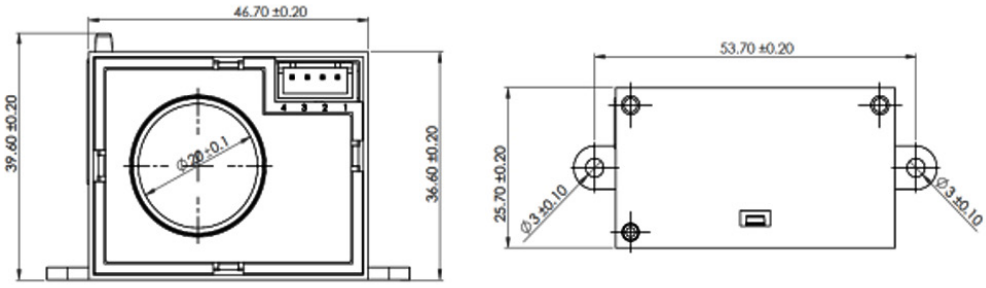
[3]Time taken for Fault out to return from Hi-Z state after fault removed.



Other

PARAMETER	MIN.	TYP.	MAX.
Overvoltage category		III	
IP Rating	IP20	-	2600

Dimensional Drawings (Millimeters)



Handling Instructions

Care should be taken to ensure the correct connection of the RCM20-01. Miswiring the product may cause permanent damage.

Wiring Diagrams

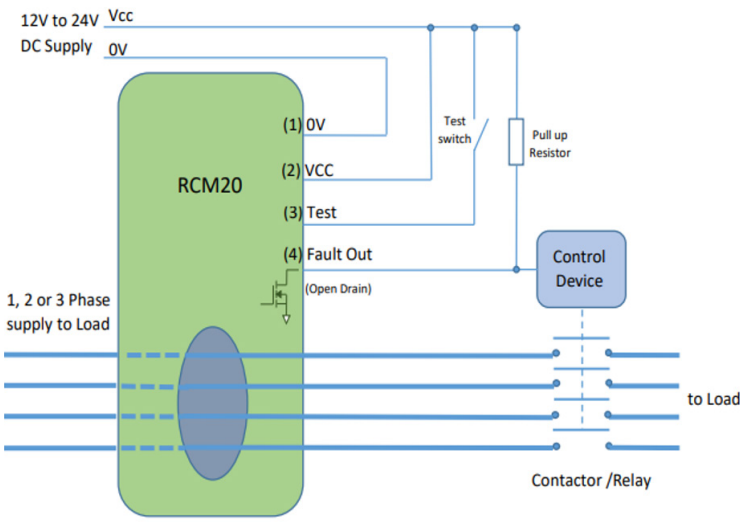


Figure 1. RCM20 Product Connections

PIN NO.	NAME	DESCRIPTION
1	0 V dc	Ground
2	Vcc	**Power Supply Input:** Positive input voltage 12 V to 24 V dc. Performance may be affected if the supply voltage falls outside this range.
3	External	**Test Function:** Apply Vcc to this pin to activate the test function. If successful, Pin 4 (Fault Out) goes HIGH. Once Vcc is removed, Fault Out returns LOW. Keep the pin disconnected when not in use. The test input can be triggered manually or by a control device. The switch shown in **Figure 1** is illustrative only.
4	Fault Signal Output (Active High Open Drain)	Open-drain output requiring an external pull-up resistor to the desired signal level (e.g., Vcc). ***LOW State (low impedance):** Indicates no fault and test function inactive. ***HIGH State (high impedance):** Triggered when residual fault current exceeds 6 mA or test function is active. *The pin resets to LOW once the fault is cleared and test is inactive. *To prevent contactor/relay chatter, direct control is not recommended. *Use hardware or software latching in the control system to capture fault signals reliably.

Note:
RCM20 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.

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	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	RoHS	Conformity with the European Restriction of Hazardous Substances in electrical and electronic products.	European Union RoHS 2 Directive 2011/65/EU
REACH	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

RCM20-03: 6 mA dc / 30 mA ac Detection to IEC 62752, 20 mm CT Aperture

RCM14-01: 6 mA dc Detection to IEC 62955, 14 mm CT Aperture