

Product data sheet

Characteristics

RM4JA31MW

current measurement relay RM4-J - range
3..1000 mA - 24..240 V AC DC



Main

Range of product	Harmony Relay
Relay type	Current measurement relay
Product or component type	Industrial measurement and control relays
Relay name	RM4J
Relay monitored parameters	Overcurrent or undercurrent detection
Time delay	Adjustable 0.05...30 s
Maximum power consumption in VA	3.3 VA AC
Measurement range	0.3...30 mA current DC 10...100 mA current DC 100...1000 mA current DC 0.3...30 mA current AC 10...100 mA current AC 100...1000 mA current AC
Contacts type and composition	2 C/O

Complementary

Maximum switching voltage	440 V AC
Operating voltage tolerance	0.85...1.1 Uc
Maximum power consumption in W	1.2 W DC
Output contacts	2 C/O
Maximum measuring cycle	80 ms
Internal input resistance	10 Ohm 33 Ohm 1 Ohm
Permissible continuous overload	0.15 A 1.5 A 0.05 A
Permissible non repetitive overload	5 A 0.2 A 0.5 A
Setting accuracy of the switching threshold	+/- 5 %
Switching threshold drift	<= 0.06 % per degree centigrade depending permissible ambient air temperature <= 0.5 % within the supply voltage range (0.85...1.1 Un)
Setting accuracy of time delay	10 P
Time delay drift	<= 0.07 % per degree centigrade depending on temperature <= 0.5 % within the supply voltage range (0.85...1.1 Un)
Hysteresis	5...30 % adjustable of current threshold setting
Marking	CE : EMC 89/336/EEC CE : LVD 73/23/EEC
Overvoltage category	III conforming to IEC 60664-1
[Ui] rated insulation voltage	500 V conforming to IEC
Supply disconnection value	> 0.1 Uc
Operating position	Any position without derating
Connections - terminals	Screw terminals, 2 x 1.5 mm ² flexible with cable end Screw terminals, 2 x 2.5 mm ² flexible without cable end
Tightening torque	0.6...1.1 N.m

Mechanical durability	30000000 cycles
[Ith] conventional free air thermal current	8 A
[Ie] rated operational current	2 A at 24 V DC-13 conforming to IEC 60947-5-1/1991 70 °C 2 A at 24 V DC-13 conforming to VDE 0660 70 °C 3 A at 115 V AC-15 conforming to IEC 60947-5-1/1991 70 °C 3 A at 115 V AC-15 conforming to VDE 0660 70 °C 3 A at 24 V AC-15 conforming to IEC 60947-5-1/1991 70 °C 3 A at 24 V AC-15 conforming to VDE 0660 70 °C 3 A at 250 V AC-15 conforming to IEC 60947-5-1/1991 70 °C 3 A at 250 V AC-15 conforming to VDE 0660 70 °C 0.1 A at 250 V DC-13 conforming to IEC 60947-5-1/1991 70 °C 0.1 A at 250 V DC-13 conforming to VDE 0660 70 °C 0.3 A at 115 V DC-13 conforming to IEC 60947-5-1/1991 70 °C 0.3 A at 115 V DC-13 conforming to VDE 0660 70 °C
Switching capacity in mA	10 mA at 12 V
Switching voltage	250 V AC
Contacts material	90/10 silver nickel contacts
Number of cables	2
Width	23 mm
Height	78 mm
Depth	80 mm
Terminals description ISO n°1	(25-26-28)OC (C-B1-B2-B3)CO (15-16-18)OC (A1-A2)CO
Output relay state	Tripped if A measured > A set Tripped if V measured > V set
9 mm pitches	2.5
Net weight	0.172 kg

Environment

Electromagnetic compatibility	Electrostatic discharge - test level: 6 kV level 3 (contact discharge) conforming to IEC 61000-4-2 Electrostatic discharge - test level: 8 kV level 3 (air discharge) conforming to IEC 61000-4-2
Standards	EN/IEC 60255-6
Product certifications	CSA[RETURN]JGL[RETURN]JUL
Ambient air temperature for storage	-40...85 °C
Ambient air temperature for operation	-20...65 °C
Environmental characteristic	3K3
Relative humidity	15...85 % conforming to IEC 60721-3-3
Shock resistance	15 gn for 11 ms conforming to IEC 60255-21-1
IP degree of protection	IP20 (terminals) conforming to IEC 60529 IP50 (casing) conforming to IEC 60529
Pollution degree	3 conforming to IEC 60664-1
Dielectric test voltage	2.5 kV
Non-dissipating shock wave	4.8 kV
Resistance to electrostatic discharge	6 kV contact conforming to IEC 61000-4-2 level 3 8 kV air conforming to IEC 61000-4-2 level 3
Resistance to electromagnetic fields	10 V/m conforming to IEC 61000-4-3 level 3
Resistance to fast transients	2 kV conforming to IEC 61000-4-4 level 3
Protection against electric shocks	2 kV: level 3 conforming to IEC 61000-4-5
Disturbance radiated/conducted	CISPR 22 - class A CISPR 11 group 1 - class A

Packing Units

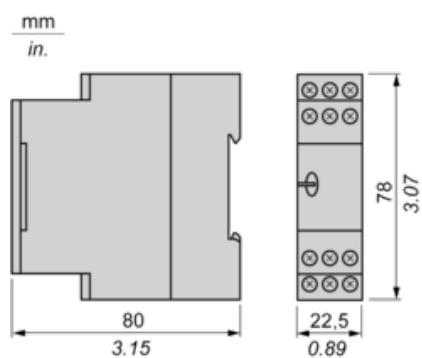
Unit Type of Package 1	PCE
Number of Units in Package 1	1

Contractual warranty

Warranty	18 months
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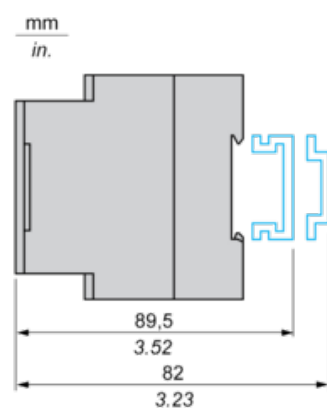
Current Measurement Relays

Dimensions

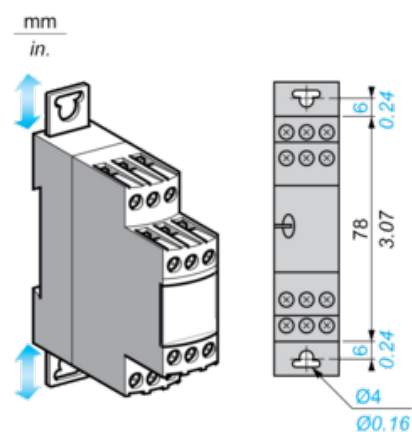


Current Measurement Relays

Rail mounting

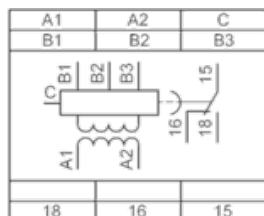


Screw fixing



Current Measurement Relays

RM4JA01 Wiring Diagram

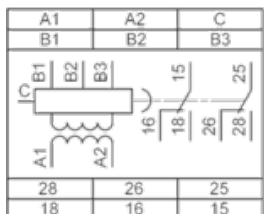


A1-A2 Supply voltage

B1, B2, B3, C Currents to be measured (see table below)

Connection and current values to be measured	
B1-C	3...30 mA
B2-C	10...100 mA
B3-C	0.1...1 A

RM4JA31 Wiring Diagram

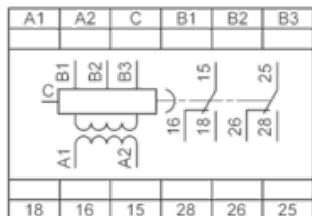


A1-A2 Supply voltage

B1, B2, B3, C Currents to be measured (see table below)

Connection and current values to be measured	
B1-C	3...30 mA
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B3-C	0.1...1 A

RM4JA32 Wiring Diagram



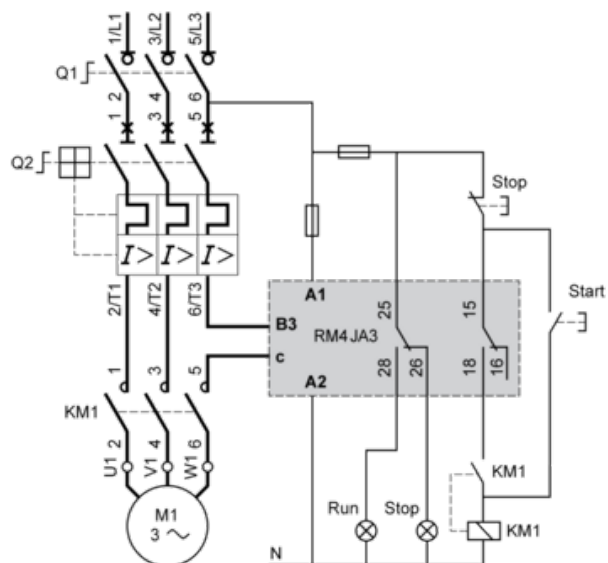
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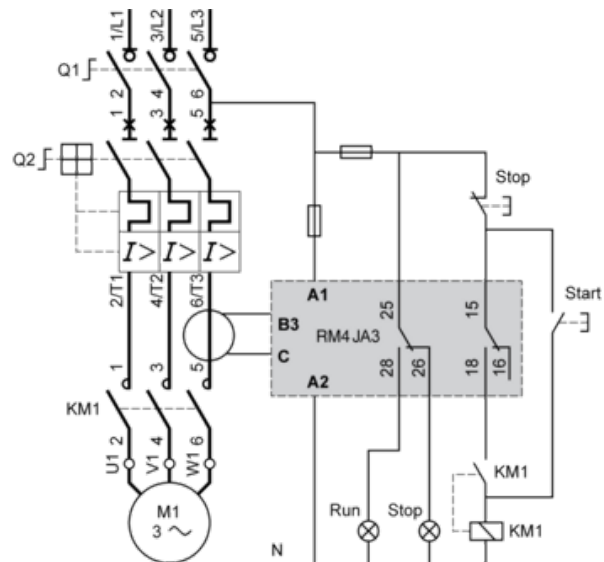
Connection and current values to be measured	
B1-C	0.3...1.5 A
B2-C	1...5 A
B3-C	3...15 A

Example: Detection of Blockage on a Crusher (Overcurrent Function)

Current measured ≤ 15 A



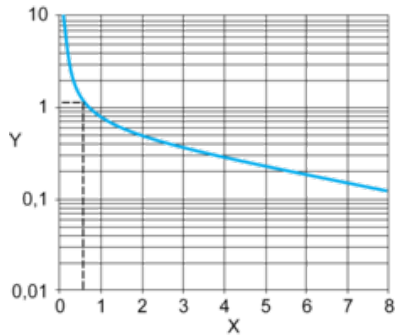
Current measured > 15 A



Electrical Durability and Load Limit Curves

AC Load

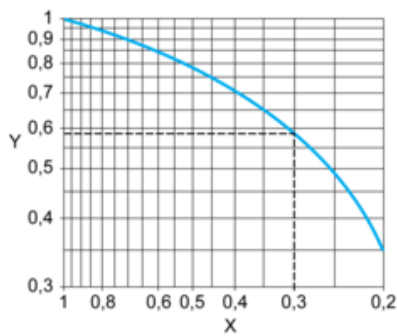
Curve 1: Electrical durability of contacts on resistive load in millions of operating cycles



X Current broken in A

Y Millions of operating cycles

Curve 2: Reduction factor k for inductive loads (applies to values taken from durability Curve 1)

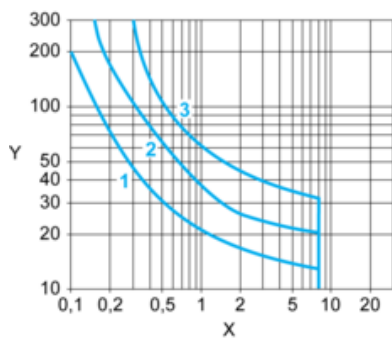


X Power factor on breaking ($\cos \varphi$)

Y Reduction factor K

DC Load

Load limit curve



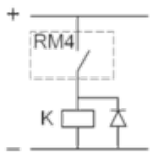
X Current in A

Y Voltage in V

1 L/R = 20 ms

2 L/R with load protection diode

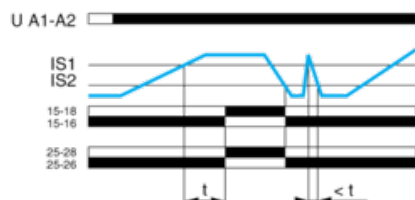
3 Resistive load



Function Diagram

Overcurrent Detection

Function ">"



Legend

t Time delay

U A1-A2 Supply voltage

IS1 Setting current threshold

IS2 Current measured

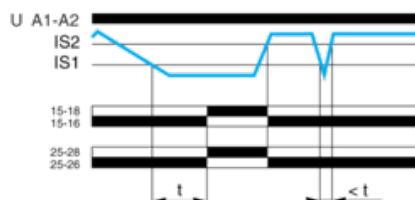
15-18, 15-16; 25-28, 25-26 Output relays connections

Relay status: black color = energized.

Function Diagram

Undercurrent Detection

Function "<"



Legend

t Time delay

U A1-A2 Supply voltage

IS1 Setting current threshold

IS2 Current measured

15-18, 15-16; 25-28, 25-26 Output relays connections

Relay status: black color = energized.