Product data sheet

Specifications

voltage measurement relay RM4-U - range 1..100 V - 220..240 V AC

RM4UA02M

Discontinued on: 31 March 2022

End-of-service on: 11 May 2022

Discontinued

Main

Range of product	Harmony Relay
Product or component type	Industrial measurement and control relays
Relay type	Voltage measurement relay
Relay name	RM4U
Relay monitored parameters	Overvoltage or undervoltage detection
Time delay	Without
Power consumption in VA	2.7…3.5 VA AC
Measurement range	1...10 V voltage AC 50/60 Hz 10...100 V voltage AC 50/60 Hz 5...50 V voltage AC 50/60 Hz <= 80 ms cycle 1...10 V voltage DC 10...100 V voltage DC 5...50 V voltage DC
Contacts type and composition	1 C/O

Complementary

Maximum switching voltage	440 V AC
[Us] rated supply voltage	220...240 V AC 50/60 Hz +/- 5 %
Output contacts	1 C/O
Internal input resistance	112000 Ohm 23000 Ohm 225000 Ohm
Permissible continuous overload	90 V 150 V 300 V
Permissible non repetitive overload	100 A for <= 1 s 200 A for <= 1 s 400 A for <= 1 s
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
Hysteresis	5…30 % adjustable of voltage threshold setting
Quality labels	CE

Overvoltage category	III conforming to IEC 60664-1
[Ui] rated insulation voltage	500 V conforming to IEC
Operating voltage tolerance	0.85...1.1 Uc
Supply disconnection value	> 0.1 Uc
Operating position	Any position without derating
Connections - terminals	Screw terminals, 2 x 1.5 mm²flexible with cable end Screw terminals, 2 x 2.5 mm²flexible 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 70 °C 24 V DC-13 conforming to IEC 60947-5-1/1991 2 A at 70 °C 24 V DC-13 conforming to VDE 0660 3 A at 70 °C 115 V AC-15 conforming to IEC 60947-5-1/1991 3 A at 70 °C 115 V AC-15 conforming to VDE 0660 3 A at 70 °C 24 V AC-15 conforming to IEC 60947-5-1/1991 3 A at 70 °C 24 V AC-15 conforming to VDE 0660 3 A at 70 °C 250 V AC-15 conforming to IEC 60947-5-1/1991 3 A at 70 °C 250 V AC-15 conforming to VDE 0660 0.1 A at 70 °C 250 V DC-13 conforming to IEC 60947-5-1/1991 0.1 A at 70 °C 250 V DC-13 conforming to VDE 0660 0.3 A at 70 °C 115 V DC-13 conforming to IEC 60947-5-1/1991 0.3 A at 70 °C 115 V DC-13 conforming to VDE 0660
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
Height	78 mm
Width	22.5 mm
Depth	80 mm
Terminals description ISO n°1	(C-B1-B2-B3)CO (15-16-18)OC (A1-A2)CO
Output relay state	Tripped if A measured > A set
9 mm pitches	2.5
Net weight	0.168 kg
Compatibility code	RM4

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 GL UL
Directives	73/23/EEC - low voltage directive 89/336/EEC - electromagnetic compatibility
Ambient air temperature for storage	-40…85 °C
Ambient air temperature for operation	-20…65 °C
Relative humidity	15…85 % 3K3 conforming to IEC 60721-3-3
Vibration resistance	0.35 ms (f= 10…55 Hz) conforming to IEC 60068-2-6
Shock resistance	15 gn for 11 ms conforming to IEC 60068-2-27

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 11 group 1 - class A CISPR 22 - class A

Packing Units

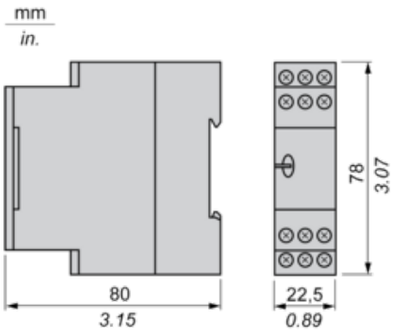
Unit Type of Package 1	PCE
Number of Units in Package 1	1
Package 1 Height	2.7 cm
Package 1 Width	8.2 cm
Package 1 Length	8.5 cm
Package 1 Weight	172 g

Contractual warranty

Warranty	18 months

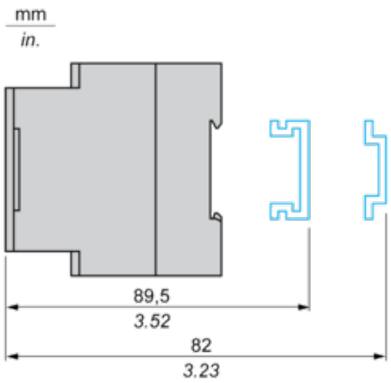
Voltage Measurement Relays

Dimensions

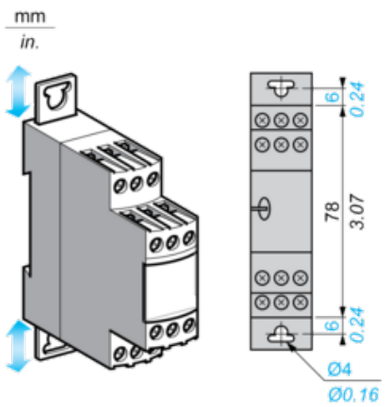


Voltage Measurement Relays

Rail mounting

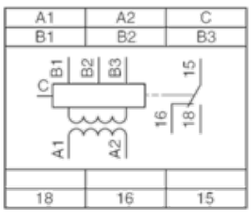


Screw fixing



Voltage Measurement Relays

RM4UA01 and RM4UA02 Wiring Diagram

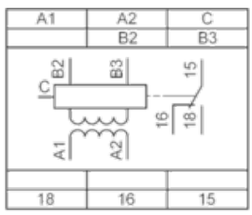


A1-A2 Supply voltage

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

Connection and current values to be measured		
RM4UA•1	B1-C	0.05…0.5 V
	B2-C	0.3…3 V
	B3-C	0.5…5 V
RM4UA•2	B1-C	1…10 V
	B2-C	5…50 V
	B3-C	10…100 V

RM4UA03 Wiring Diagram

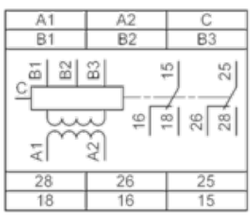


A1-A2 Supply voltage

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

Connection and current values to be measured	
B2-C	30…300 V
B3-C	50…500 V

RM4UA31 and RM4UA32 Wiring Diagram

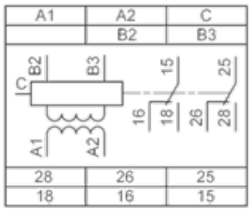


A1-A2 Supply voltage

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

Connection and current values to be measured		
RM4UA•1	B1-C	0.05…0.5 V
	B2-C	0.3…3 V
	B3-C	0.5…5 V
RM4UA•2	B1-C	1…10 V
	B2-C	5…50 V
	B3-C	10…100 V

RM4UA33 Wiring Diagram



A1-A2 Supply voltage

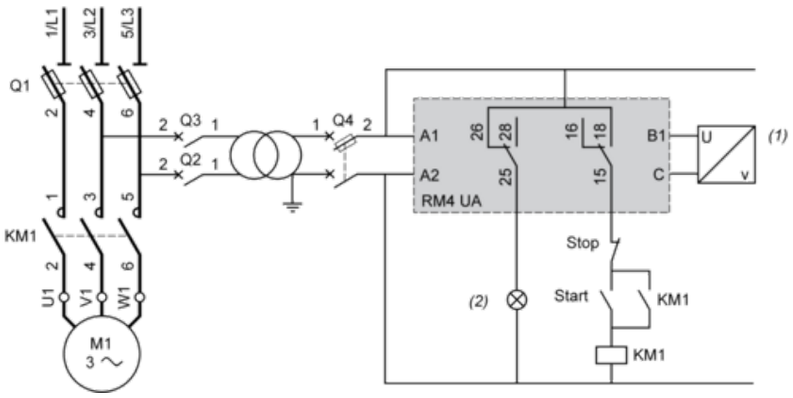
B2, B3, C Voltages to be measured (see table below)

Connection and current values to be measured	
B2-C	30…300 V
B3-C	50…500 V

Voltage Measurement Relays

Application Scheme

Example: overspeed monitoring (undervoltage function)



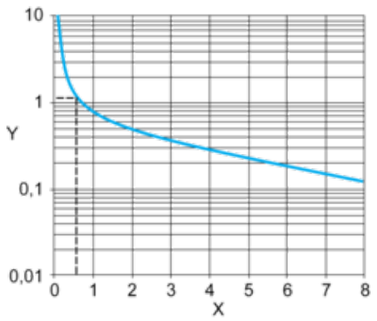
(1) Tachogenerator

(2) Overspeed

Electrical Durability and Load Limit Curves

AC Load

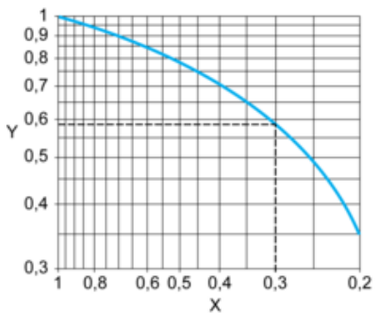
Curve 1: Electrical durability of contacts on resistive load in millions of operating cycles



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)

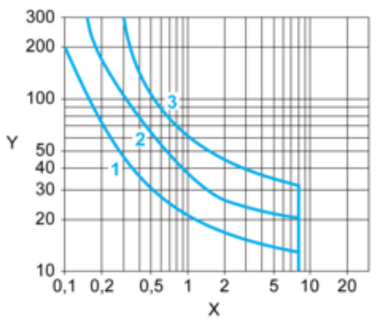


X Power factor on breaking (cos φ)

Y Reduction factor K

DC Load

Load limit curve



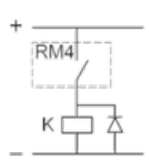
X Current in A

Y Voltage in V

1 L/R = 20 ms

2 L/R with load protection diode

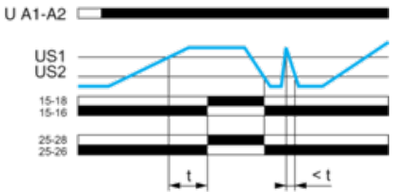
3 Resistive load



Function Diagram

Overvoltage Control

Function “>”



Legend

t Time delay

U A1-A2 Supply voltage

US1 Setting voltage threshold

US2 Voltage measured

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

Relay status: black color = energized.

Recommended replacement(s)

RM4UA02M is replaced by:

1x 

Modular 1 phase overvoltage control relay, Harmony, 8A, 2CO, 1…100V AC DC measurement, 24…240V AC DC

RM22UA22MR