

# RM4UA33Q

voltage measurement relay RM4-U - range  
30..500 V - 380..415 V AC



## Main

|                               |                                                                                                                    |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------|
| Range of product              | Zelio Control                                                                                                      |
| 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                    | Adjustable 0.05...30 s                                                                                             |
| Power consumption in VA       | 2.7...3 VA AC                                                                                                      |
| Measurement range             | 50...500 V voltage DC<br>30...300 V voltage DC<br>50...500 V voltage AC 50/60 Hz<br>30...300 V voltage AC 50/60 Hz |
| Contacts type and composition | 2 C/O                                                                                                              |

## Complementary

|                                             |                                                                                                                                                       |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| [Us] rated supply voltage                   | 380...415 V AC, 50/60 Hz +/- 5 %                                                                                                                      |
| Output contacts                             | 2 C/O                                                                                                                                                 |
| Internal input resistance                   | 1111000 Ohm<br>11110000 Ohm<br>668000 Ohm                                                                                                             |
| Permissible continuous overload             | 400 V<br>550 V                                                                                                                                        |
| Permissible non repetitive overload         | 550 A for <= 1 s<br>500 A for <= 1 s                                                                                                                  |
| Setting accuracy of the switching threshold | +/- 5 %                                                                                                                                               |
| Switching threshold drift                   | <= 0.5 % within the supply voltage range (0.85...1.1 Un)<br><= 0.06 % per degree centigrade depending permissible ambient air temperature             |
| Setting accuracy of time delay              | 10 P                                                                                                                                                  |
| Time delay drift                            | <= 0.5 % within the supply voltage range (0.85...1.1 Un)<br><= 0.07 % per degree centigrade depending on the rated operational temperature            |
| 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 2.5 mm <sup>2</sup> , flexible cable without cable end<br>Screw terminals 2 x 1.5 mm <sup>2</sup> , flexible cable with cable end |
| Tightening torque                           | 0.6...1.1 N.m                                                                                                                                         |
| Mechanical durability                       | <= 30000000 cycles                                                                                                                                    |
| [Ith] conventional free air thermal current | 8 A                                                                                                                                                   |

The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein. This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof. Neither Schneider Electric Industries SAS nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information contained herein.

|                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [I <sub>e</sub> ] rated operational current | 0.3 A at 115 V DC-13 70 °C conforming to VDE 0660<br>0.3 A at 115 V DC-13 70 °C conforming to IEC 60947-5-1/1991<br>0.1 A at 250 V DC-13 70 °C conforming to VDE 0660<br>0.1 A at 250 V DC-13 70 °C conforming to IEC 60947-5-1/1991<br>3 A at 250 V AC-15 70 °C conforming to VDE 0660<br>3 A at 250 V AC-15 70 °C conforming to IEC 60947-5-1/1991<br>3 A at 24 V AC-15 70 °C conforming to VDE 0660<br>3 A at 24 V AC-15 70 °C conforming to IEC 60947-5-1/1991<br>3 A at 115 V AC-15 70 °C conforming to VDE 0660<br>3 A at 115 V AC-15 70 °C conforming to IEC 60947-5-1/1991<br>2 A at 24 V DC-13 70 °C conforming to VDE 0660<br>2 A at 24 V DC-13 70 °C conforming to IEC 60947-5-1/1991 |
| Switching capacity in mA                    | 10 mA at 12 V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Switching voltage                           | 250 V AC<br>≤ 440 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               | (15-16-18)OC<br>(25-26-28)OC<br>(A1-A2)CO<br>(C-B2-B3)CO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Output relay state                          | Tripped if A measured > A set                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 9 mm pitches                                | 2.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Product weight                              | 0.168 kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

## Environment

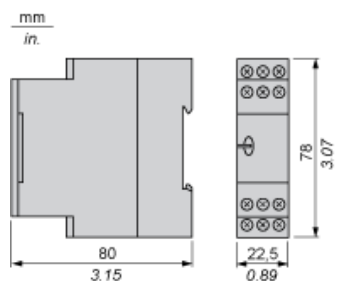
|                                       |                                                                                                  |
|---------------------------------------|--------------------------------------------------------------------------------------------------|
| Standards                             | EN/IEC 60255-6                                                                                   |
| Product certifications                | CSA<br>GL<br>UL                                                                                  |
| Directives                            | 89/336/EEC - electromagnetic compatibility<br>73/23/EEC - low voltage directive                  |
| 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               | IP50 (casing) conforming to IEC 60529<br>IP20 (terminals) 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 | 8 kV air conforming to IEC 61000-4-2 level 3<br>6 kV contact 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<br>CISPR 22 - class A                                                 |

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Voltage Measurement Relays

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Dimensions

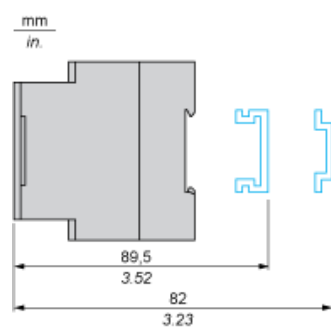


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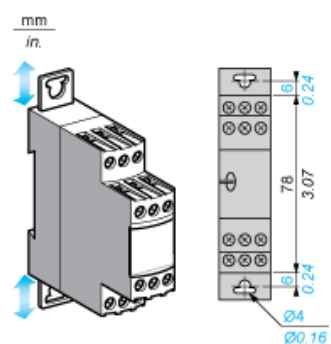
Voltage Measurement Relays

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Rail mounting

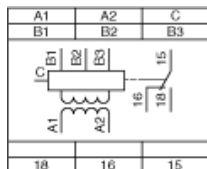


Screw fixing



## Voltage Measurement Relays

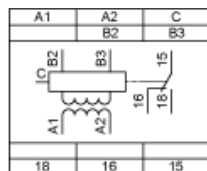
### RM4UA01 and RM4UA02 Wiring Diagram



A1- Supply voltage  
A2  
B1, Voltages to be measured (see table below)  
B2,  
B3, C

| 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 |              |

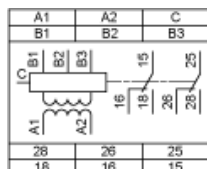
### RM4UA03 Wiring Diagram



A1- Supply voltage  
A2  
B2, Voltages to be measured (see table below)  
B3, C

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

### RM4UA31 and RM4UA32 Wiring Diagram

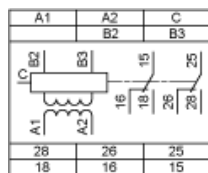


A1- Supply voltage  
A2  
B1, Voltages to be measured (see table below)  
B2,  
B3, C

| Connection and current values to be measured |           |              |
|----------------------------------------------|-----------|--------------|
| RM4UA•1                                      | B1-C      | 0.05...0.5 V |
| B2-C                                         | 0.3...3 V |              |

| Connection and current values to be measured |            |          |
|----------------------------------------------|------------|----------|
| 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- Supply voltage

A2

B2, Voltages to be measured (see table below)

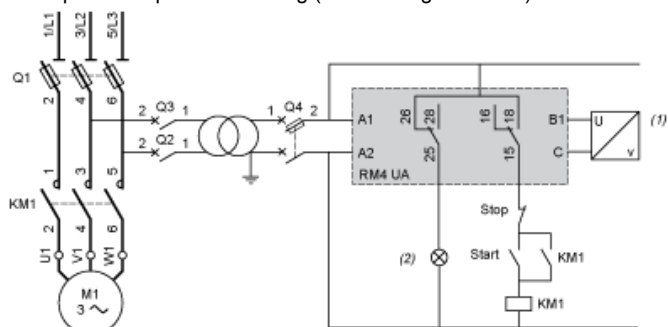
B3, C

| 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)



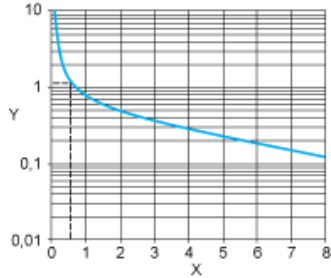
(1) Tachogenerator

(2) Overspeed

## Electrical Durability and Load Limit Curves

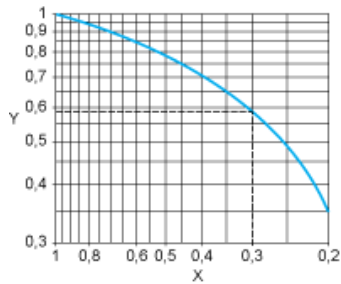
### AC Load

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



X Current broken in A  
Y Millions of operating cycles

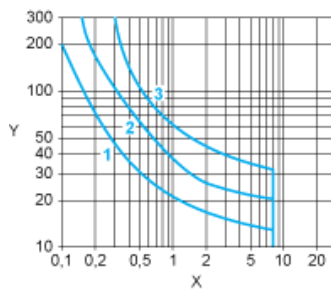
Curve 2: Reduction factor k for inductive loads (applies to values taken from durability Curve 1)



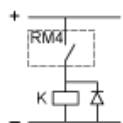
X Power factor on breaking ( $\cos \varphi$ )  
Y Reduction factor K

### DC Load

Load limit curve



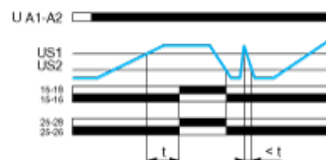
X Current in A  
Y Voltage in V  
1  $L/R = 20$  ms  
2  $L/R$  with load protection diode  
3 Resistive load



## Function Diagram

### Overvoltage Control

Function ">"



#### Legend

t Time delay

U A1-A2 Supply voltage

US1 Setting voltage threshold

US2 Voltage measured

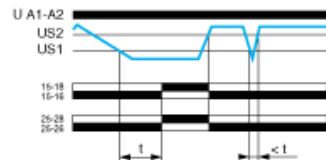
15-18, 15-16; 25-28, 25-26 Output relays connections

Relay status: black color = energized.

## Function Diagram

### Undervoltage Control

Function "<"



#### Legend

t Time delay

U A1-A2 Supply voltage

US1 Setting voltage threshold

US2 Voltage measured

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Relay status: black color = energized.