



Main

Range of product	Zelio Control
Product or component type	Industrial measurement and control relays
Relay type	Control relay
Product specific application	For 3-phase supply
Relay name	RM4-T
Relay monitored parameters	Overvoltage and undervoltage detection Phase failure detection Phase sequence
Time delay	Adjustable 0.1...10 s
Measurement range	290...484 V
Contacts type and composition	2 C/O
Poles description	3P

Complementary

[Us] rated supply voltage	380...440 V 50/60 Hz
Control threshold undervoltage	300...430 V
Control threshold overvoltage	420...480 V
Output contacts	2 C/O
Setting accuracy of the switching threshold	+/- 3 %
Switching threshold drift	<= 0.5 % within the measuring range <= 0.06 % per degree centigrade depending permissible ambient air temperature
Setting accuracy of time delay	10 P
Time delay drift	<= 0.5 % within the measuring range <= 0.07 % per degree centigrade depending on the rated operational temperature
Hysteresis	5 % fixed of de-energisation threshold
Delay at power up	< 650 ms
Measuring cycle	<= 80 ms
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 frequency	50/60 Hz +/- 5 %
Operating position	Any position without
Connections - terminals	Screw terminals 2 x 2.5 mm ² , flexible cable without cable end Screw terminals 2 x 1.5 mm ² , 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
[Ie] rated operational current	0.3 A at 70 °C 115 V DC-13 conforming to VDE 0660 0.3 A at 70 °C 115 V DC-13 conforming to IEC 60947-5-1/1991 0.1 A at 70 °C 250 V DC-13 conforming to VDE 0660 0.1 A at 70 °C 250 V DC-13 conforming to IEC 60947-5-1/1991 3 A at 70 °C 250 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 24 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 115 V AC-15 conforming to VDE 0660 3 A at 70 °C 115 V AC-15 conforming to IEC 60947-5-1/1991 2 A at 70 °C 24 V DC-13 conforming to VDE 0660 2 A at 70 °C 24 V DC-13 conforming to IEC 60947-5-1/1991

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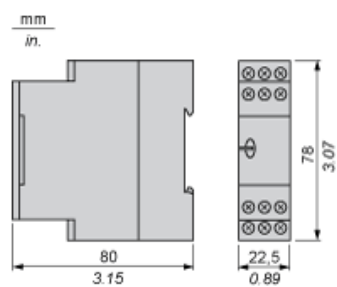
Switching capacity in mA	10 mA at 12 V
Switching voltage	250 V AC ≤ 440 V AC
Contacts material	90/10 silver nickel contacts
Number of cables	2
Height	78 mm
Width	22.5 mm
Depth	80 mm
Terminals description ISO n°1	(15-16-18)OC (25-26-28)OC (L1-L2-L3)CO
Output relay state	Tripped, fault present
9 mm pitches	2.5
Product weight	0.11 kg

Environment

Standards	EN/IEC 60255-6
Product certifications	CSA GL UL
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 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 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 conforming to IEC 61000-4-5 level 3
Disturbance radiated/conducted	CISPR 11 group 1 - class A CISPR 22 - class A

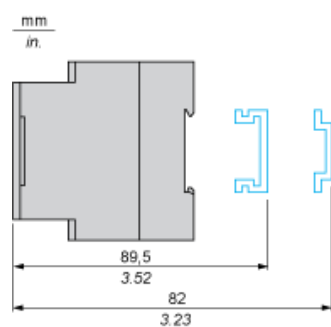
3-phase Supply Control Relays

Dimensions

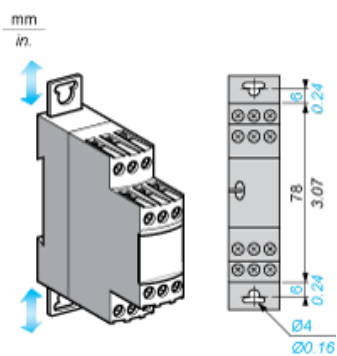


3-phase Supply Control Relays

Rail mounting



Screw fixing



3-Phase Supply Control Relays

Wiring Diagram



L1, Supply to be monitored

L2,

L3

15-18 1st C/O contact of the output relay

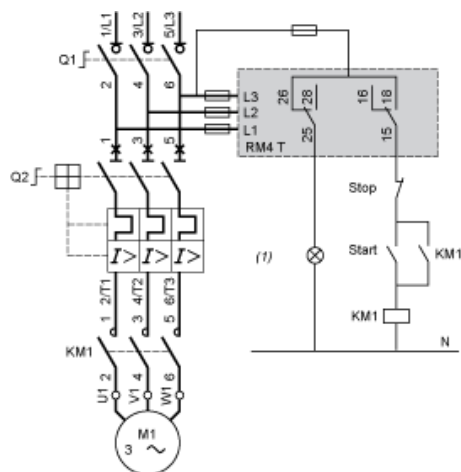
15-16

25-28 2nd C/O contact of the output relay

25-26

Application Scheme

Example

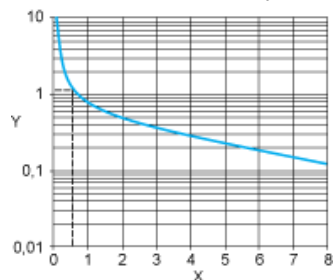


(1) Fault

Electrical Durability and Load Limit Curves

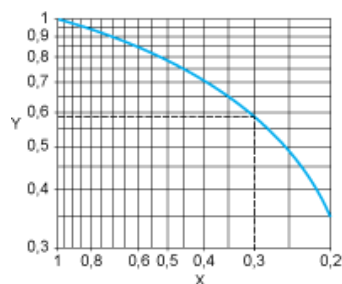
AC Load

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

Example: An LC1-F185 contactor supplied with 115 V/50 Hz for a consumption of 55 VA or a current consumption equal to 0.5 A and $\cos \varphi = 0.3$.

For 0.5 A, curve 1 indicates a durability of approximately 1.5 million operating cycles.

As the load is inductive, it is necessary to apply a reduction coefficient k to this number of cycles as indicated by curve 2.

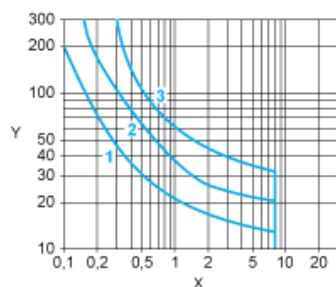
For $\cos \varphi = 0.3$: $k = 0.6$

The electrical durability therefore becomes:

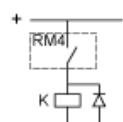
$$1.5 \times 10^6 \text{ operating cycles} \times 0.6 = 900\,000 \text{ operating cycles}$$

DC Load

Load limit curve



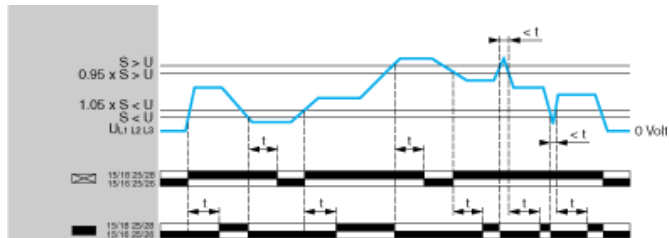
X Current in A
Y Voltage in V
1 $L/R = 20 \text{ ms}$
2 L/R with load protection diode
3 Resistive load



Function Diagram

Overvoltage and Undervoltage Detection

Functions "Fault detection delayed" or "Fault detection extended" (by switch selector)



- t Time delay (adjustable from 0.1 s to 10 s with a selector switch)
- U 3-phase supply voltage monitored (between terminals L1, L2 and L3)
- S Overvoltage or undervoltage setting
- 15/18 Output relays connections (refer to Connections and Schema)
- 15/16;
- 25/28,
- 25/26

Relay status: black color = energized.

NOTE: In order to be detected, the duration of the overvoltage or undervoltage must be greater than the measuring cycle time (80 ms).