Zelio® Control Measurement Relays
RM17 and RM35

Catalog
8430CT0601
2007

CONTENTS

a brand of Schneider Electric

Telemecanique

Application	Control of 3-phase supplies			
Functions	**- Phase sequence - Phase failure - Asymmetry**	**- Phase sequence - Phase failure - Undervoltage**	**- Phase sequence - Phase failure - Asymmetry - Overvoltage and undervoltage**	**- Phase sequence - Phase failure - Motor temperature**
Modular type (17.5 or 35 mm width)				
Values controlled	208–480 Vac 208–440 Vac	208–480 Vac	208–480 Vac 220–480 Vac	208–480 Vac
Output	1 or 2 C/O contacts	1 C/O	1 or 2 C/O contacts	2 N.O. contacts
Size Inch (mm)	0.69 (17.5)	0.69 (17.5)	0.69 (17.5) or 1.38 (35)	1.38 (35)
Catalog number	**RM17TG●0 RM17TT00 RM17TA00**	**RM17TU00**	**RM17TE00 RM35TF30**	**RM35TM●50MW**
See Pages	6 to 9, 10 to 18	10 to 18	10 to 18, 19 to 23	24 to 29

1 C/O = 

2 C/O = 

Application	Voltage control				Current control	
Functions	**3-phase**	**Single-phase and d.c.**			**Integrated current transformer**	**–**
	- Overvoltage and undervoltage between phases - Overvoltage and undervoltage between phases and neutral - Absence of neutral / phase	**- Overvoltage or undervoltage - Self-powered**	**- Overvoltage and undervoltage in window mode - Self-powered**	**- Overvoltage or undervoltage**	**- Overcurrent**	**- Overcurrent or undercurrent**
Modular type (17.5 or 35 mm width)						
Values controlled	220–480 Vac 208–480 Vac 120–277 Vac	9–15 Vdc 20–80 Vac/Vdc 65–260 Vac/Vdc	20–80 Vac/Vdc 65–260 Vac/Vdc	0.05–5 Vac/Vdc 1–100 Vac/Vdc 15–600 Vac/Vdc	2–20 A	2–500 mA 0.15–15 A
Output	1 C/O contact or 1 C/O contact + 1 C/O contact	1 C/O contact	1 C/O contact	2 C/O contacts	1 C/O contact	2 C/O contacts
Size Inch (mm)	0.69 (17.5) or 1.38 (35)	0.69 (17.5)	0.69 (17.5)	1.38 (35)	0.69 (17.5)	1.38 (35)
Catalog number	**RM17UB310 RM35UB3●●●**	**RM17UAS1●**	**RM17UBE1●**	**RM35UA1●MW**	**RM17JC00MW**	**RM35JA3●MW**
See Pages	30 to 37	38 to 43	38 to 43	44 to 48	49 to 52	53 to 57

1 C/O =

2 C/O =

Application	Level control		Pump control
Functions	**By resistive probes** **- Empty or fill**	**By discrete sensor** **- Empty or fill** **- Input for discrete sensor AON: Contact/PNP/NPN**	**3-phase and single-phase** **- Overcurrent and undercurrent** **- Phase sequence on 3-phase supply** **- Phase failure on 3-phase supply**
Modular type (17.5 or 35 mm width)			
Values controlled	0.25–5 kΩ 5–100 kΩ 0.05–1 MΩ	–	Current: 1–10 A 3-phase 208–480 Vac Single-phase 230 Vac
Output	2 C/O contacts	1 C/O contact	1 C/O contact
Size Inch (mm)	1.38 (35)	1.38 (35)	1.38 (35)
Catalog number	**RM35LM33MW**	**RM35LV14MW**	**RM35BA10**
See Pages	58 to 68	58 to 68	69 to 75

1 C/O =

2 C/O =

Application	Frequency control	Speed control	Temperature control for elevator machine rooms and 3-phase supplies	
Functions	**- Over-frequency and under-frequency**	**- Over or under operating rate / speed**	**- Machine room temperature**	**- Machine room temperature - Phase failure and phase sequence**
Modular type **(17.5 or 35 mm width)**				
Values controlled	Mains supply: 50 or 60 Hz High threshold: - 2 to + 10 Hz Low threshold: - 10 to + 2 Hz	Time controlled between pulses: 0.05–0.5 s, 0.1–1 s, 0.5–5 s, 1–10 s 0.1–1 min, 0.5–5 min,1–10 min	Temperature Low threshold: 30 to 51 °F (- 1 to 11 °C) High threshold: 93 to 114 °F (34 to 46 °C)	Temperature Low threshold: 30 to 51 °F (- 1 to 11 °C) High threshold: 93 to 114 °F (34 to 46 °C) 3-phase supplies 208–480 Vac
Output	1 C/O contact + 1 C/O contact	1 C/O contact	1 C/O contact or 2 N.O. contacts	2 N.O. contacts
Size Inch (mm)	1.38 (35)	1.38 (35)	1.38 (35)	1.38 (35)
Catalog number	**RM35HZ21FM**	**RM35S0MW**	**RM35ATL0MW** **RM35ATR5MW**	**RM35ATW5MW**
See Pages	76 to 79	80 to 87	88 to 94	88 to 94

1 C/O = 

2 N.O. = 

105662

RM17TG●0

Product description

RM17TG●0 measurement and control relays are for monitoring of 3-phase supplies and the correct sequencing of phases L1, L2 and L3, as well as the total loss of one or more of these phases.

These control relays accept different nominal 3-phase voltage values:

- 208–480 Vac for RM17TG00
- 208–440 Vac for RM17TG20

They monitor their own power supply, measured as a true rms value.

Relay status is indicated by an LED.

- When relay is energized, LED is illuminated.
- When relay is not energized, LED is not illuminated.

The relays are designed for clip-on mounting on ⊓ rail.

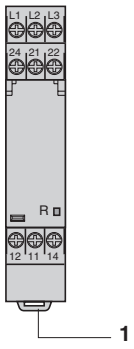
Applications

- Control of moving equipment (site equipment, agricultural equipment, refrigerated trucks)
- Control for protection of people and equipment against the consequences of reverse running (lifting, handling, elevators, escalators, etc.)
- Control of sensitive 3-phase supplies
- Protection against the risk of a driving load (phase failure/back EMF)
- Normal/emergency power supply switching

Description

RM17TG00

RM17TG20



1 Spring for clip-on mounting on 35 mm ⊓ rail.

R Yellow LED: indicates relay output state.

Operating principle

3-phase supply control relays monitor:

- Correct sequencing of phases L1, L2 and L3

Fault signalling is by LED.

Phase control relays: RM17TG●0

The relay monitors its own power supply.

The relay monitors:

- Correct sequencing of the three phases
- Total loss of one or more of the phases

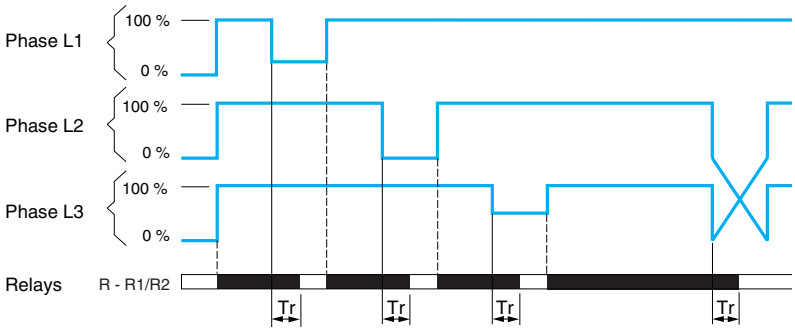
When phase sequence and voltages are correct (> 183 Vac), the output relay(s) is/are closed and the yellow LED is on.

In the event of a sequencing fault or total loss of one or more phases (detected as soon as one of the voltages drops below 100 Vac) the relay opens instantly and the LED goes out.

When the fault is cleared, the output relay re-energizes instantaneously.

On energization of the device with a fault measured, the relay stays open.

Function diagram



Tr: response time on appearance of a fault. Maximum of 100 ms. Not adjustable.

Environment characteristics

Conforming to standards			NF EN 60255-6 and IEC 60255-6
Product certifications	Pending		UL (File E173076 CNN NRNT), CSA (File 217698 Guide 3211-07), GL, C-Tick, GOST
Marking			CE: 73/23/EEC and EMC 89/336/EEC, RoHS
Ambient air temperature around the device	Storage	**°F (°C)**	-40 to 158 (- 40 to + 70)
	Operation	**°F (°C)**	-4 to 122 (- 20 to + 50)
Permissible relative humidity	Conforming to IEC 60068-2-30		2 x 24 hours to + 95 % RH at + 131 °F (55 °C) without condensation
Vibration resistance	Conforming to IEC 60068-2-6		0.035 mm from 10–150 Hz
Shock resistance	Conforming to IEC 60068-2-6		5 gn
Degree of protection Conforming to IEC 60529	Casing		IP 30
	Terminals		IP 20
Degree of pollution	Conforming to IEC 60664-1		3
Overvoltage category	Conforming to IEC 60664-1		III
Insulation resistance	Conforming to 60664-1/60255-5		> 500 MΩ, 500 Vdc
Rated insulation voltage	Conforming to IEC 60664-1	**V**	400
Insulation test voltage	Dielectric test	**kV**	2, 50 Hz, 1 min. on Vac
	Shock wave	**kV**	4
Mounting position without derating	In relation to normal vertical mounting plane		Any position
Wire range. Conforming to IEC 60947-1 and UL 508	Solid cable without cable end	**AWG (mm^2)**	One 14–20 (2.5–0.5) Two 16–20 (1.5–0.5)
	Flexible cable with cable end	**AWG (mm^2)**	One 14–20 (2.5–0.5) Two 16–20 (1.5–0.5)
Tightening torque	Conforming to IEC 60947-1 and UL 508		0.6–1 N.m / *5.3–8.8 lb-in*
Housing material			Self-extinguishing plastic
Relay state indicator			Yellow LED
Mounting	Conforming to IEC/EN 60715		On 35 mm ⊓ rail

Supply characteristics

Relay type			**RM17TG00**	**RM17TG20**
Rated supply voltage Un		**Vac**	208–480	208–440
Operating range		**Vac**	183–528	183–484
Voltage limits	Of the power supply circuit		- 12 %, + 10 %	
Frequency	Of the power supply circuit	**Hz**	50/60 Hz ± 10 %	
Galvanic isolation, supply/measurement			No	
Maximum power consumption		**VA**	1.8 on Vac	
Immunity to microbreaks		**ms**	60	

Immunity to electromagnetic interference

Electromagnetic compatibility			Immunity NF EN 61000-6-2 / IEC 61000-6-2 Emission NF EN 61000-6-4 NF EN 61000-6-3 IEC 61000-6-4 IEC 61000-6-3

Input and measurement circuit characteristics

Guaranteed detection threshold for phase failure		**Vac**	< 100
Frequency of the measured signal		**Hz**	50–60 ± 10 %

Output characteristics

Output type			1 C/O contact	2 C/O contacts
Contact type			Cadmium-free	
Current rating—Resistive (Inductive)		**A**	5 (1 A at 240 Vdc, 5 A at 24 Vac, 3 A at 250 Vac)	
Maximum switching voltage		**Vac/Vdc**	250	
Rated breaking capacity		**VA**	1250	
Minimum breaking current		**mA**	10/5 Vdc	
Electrical durability ▲			1 x 10^5 operating cycles	1 x 10^4 operating cycles
Mechanical durability ▲			30 x 10^6 operating cycles	
Maximum operating rate			360 operations/hour under full load	
Utilization categories	Conforming to IEC 60947-5-1		AC-12, AC-13, AC-14, AC-15, DC-12, DC-13	
Max. response time in the event of a fault		**ms**	100	
Delay on pick-up		**ms**	500	

▲ The expected life expressed above is based on average usage and normal operating conditions. Actual operating life will vary with conditions. The above statements are not intended to nor shall they create any expressed or implied warranties as to product operation or life. For information on the listed warranty offered on this product, refer to the Square D Conditions of Sale found in the Digest.

Catalog numbers

105661

RM17TG00

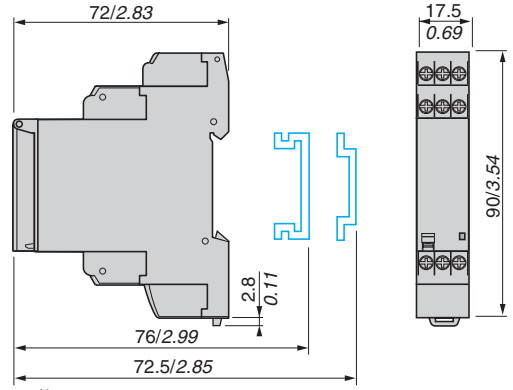
105662

RM17TG20

Function	Rated 3-phase supply voltage Vac	Output	Catalog numbers	Weight lb(kg)
• Phase sequence • Phase failure	208–480	1 C/O 5 A	**RM17TG00**	0.176 (0.080)
	208–440	2 C/O 5 A	**RM17TG20**	0.187 (0.085)

Approximate dimensions

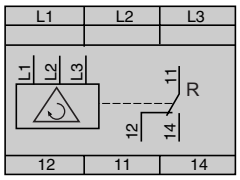
RM17TG●0



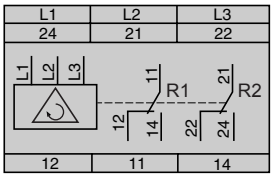
mm/*In.*

Wiring diagrams

RM17TG00

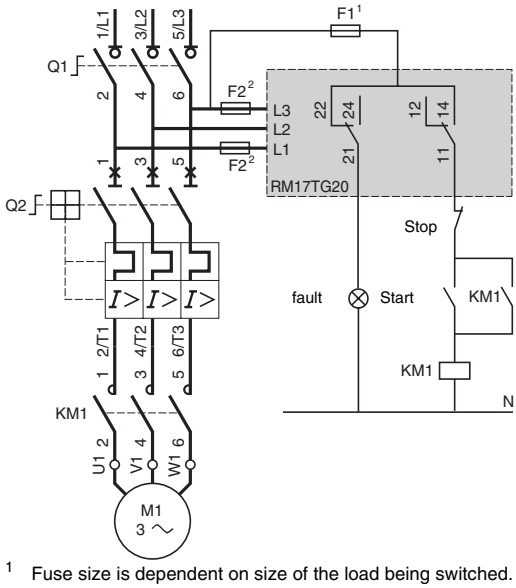


RM17TG20



Wiring diagrams

Example



1 Fuse size is dependent on size of the load being switched.

2 100 mA fast-acting fuse—UL = Class CC, IEC = gG

105667

RM17T●00

Product description

RM17TT, RM17TA, RM17TU and RM17TE multifunction control relays monitor the following on 3-phase supplies:

Function performed	RM17TT	RM17TA	RM17TU	RM17TE
Sequence of phases L1, L2 and L3.	Yes	Yes	Yes	Yes
Phase failure with regeneration	Yes	Yes	Yes	Yes
Asymmetry (phase imbalance)	No	Yes	No	Yes
Undervoltage	No	No	Yes	No
Overvoltage and undervoltage	No	No	No	Yes

These control relays accept different nominal 3-phase voltage values: 208–480 Vac.

They monitor their own supply voltage, measured as a true rms value.

Settings are protected by a sealable cover.

Control status is indicated by an LED.

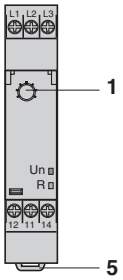
The relays are designed for clip-on mounting on ⊓ rail.

Applications

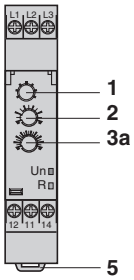
- Control of moving equipment (site equipment, agricultural equipment, refrigerated trucks)
- Control for protection of people and equipment against the consequences of reverse running (lifting, handling, elevators, escalators, etc.)
- Control of sensitive 3-phase supplies
- Protection against the risk of a driving load (phase failure/back EMF)
- Normal/emergency power supply switching

Description

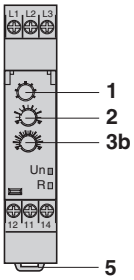
RM17TT00



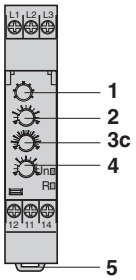
RM17TA00



RM17TU00



RM17TE00



1 Voltage range selector switch (208, 220, 380, 400, 415, 440 and 480 V).

2 Time delay adjustment potentiometer, **Tt**

3a Asymmetry threshold setting potentiometer, **Asy**

3b Undervoltage setting potentiometer, **<U**

3c Undervoltage/overvoltage setting potentiometer, **ΔU**

4 Asymmetry threshold setting potentiometer, **Asy**

5 Spring for clip-on mounting on 35 mm ⊓ rail.

Un	Green LED: indicates that supply to the relay is on.
R	Yellow LED: indicates relay output state.

Operating principle

3-phase supply control relays monitor:

- The correct sequence of phases L1, L2, L3
- Phase failure, including the case of voltage regeneration (back EMF)
- Undervoltage from - 2 to - 20% of the supply voltage Un
- Overvoltage from 2–20% of the supply voltage Un
- Asymmetry from 5–15% of the supply voltage Un (Phase imbalance)
- Fault signalling is by LED

■ **Voltage selector switch**:

- Set the switch to the 3-phase supply voltage Un.
- The position of this switch is only taken into account on energization of the device.
- If the switch position is changed while the device is operating, all the LEDs flash, but the product continues to operate normally with the voltage selected at the time of energization preceding the change of position.
  The LEDs return to their normal state if the switch is returned to the original position selected prior to the last energization.

Phase control relay with voltage regeneration: RM17TT00

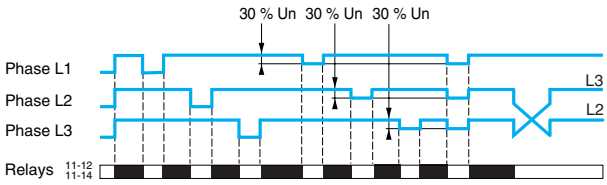
■ **The relay monitors its own supply voltage Un.**

- The relay monitors:
  - — correct sequence of the three phases
  - — failure of at least one of the three phases (U measured < 0.7 x Un)
- In the event of a sequencing or phase failure fault, the relay opens instantly.
- When the fault is cleared, the output relay re-energizes instaneously.
- On energization of the device with a fault measured, the relay stays open.

Function diagram

■ **Function:**

- Sequence of phases L1, L2, L3
- Phase failure



Phase and asymmetry control relay: RM17TA00

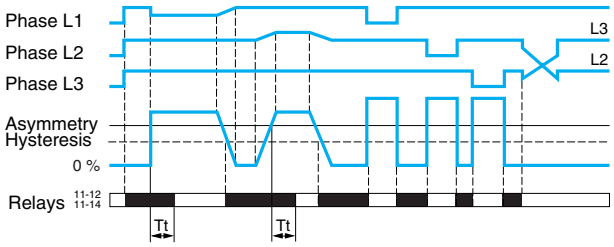
■ **The relay monitors its own supply voltage Un.**

- The relay monitors:
  - — correct sequence of the three phases
  - — failure of at least one of the three phases (U measured < 0.7 x Un)
  - — asymmetry adjustable from 5–15% of Un (Phase imbalance)
- In the event of a sequencing or phase failure fault, the relay opens instantly.
- In the event of an asymmetry fault, the relay opens at the end of the time delay set by the user.
- On energization of the device with a fault measured, the relay stays open.

Function diagram

■ **Function:**

- Sequence of phases L1, L2, L3
- Phase failure
- Asymmetry, **Asy**



Tt: time delay after crossing of threshold (adjustable on front panel) 0.1–10 s.

Phase + undervoltage control relays: RM17TU00

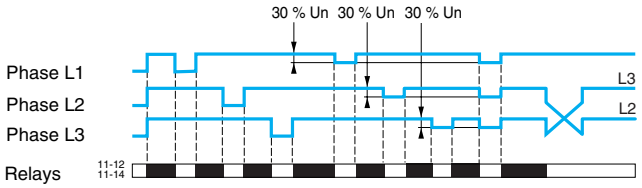
■ **The relay monitors its own supply voltage Un.**

- The relay monitors:
  - — correct sequence of the three phases
  - — failure of at least one of the three phases (U measured < 0.7 x Un)
  - — undervoltage adjustable from - 2 to - 20% of Un (- 2 to - 12% in the range 3 x 208 Vac and - 2% to - 17% in the range 3 x 220 Vac due to the minimum voltage 183 Vac)
- In the event of a sequencing or phase failure fault, the relay opens instantly.
- In the event of a voltage fault, the relay opens at the end of the time delay set by the user.
- On energization of the device with a fault measured, the relay stays open.

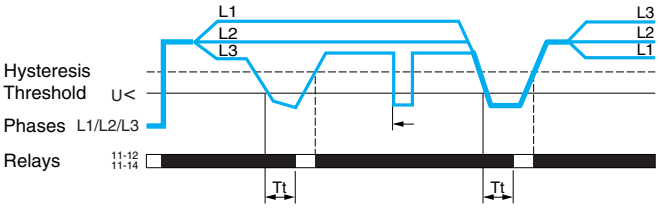
Function diagrams

■ **Function:**

- Sequence of phases L1, L2, L3
- Phase failure



- Undervoltage control, **< U**



Tt: time delay after crossing of threshold (adjustable on front panel)

Phase + asymmetry + undervoltage/overvoltage control relay: RM17TE00

■ **The relay monitors its own supply voltage Un.**

- The relay monitors:
  - — correct sequence of the three phases
  - — failure of at least one of the three phases (U measured < 0.7 x Un)
  - — asymmetry adjustable from 5–15% of Un (Phase imbalance)
  - — the overvoltage and undervoltage difference in window mode, adjustable from 2–20% of Un

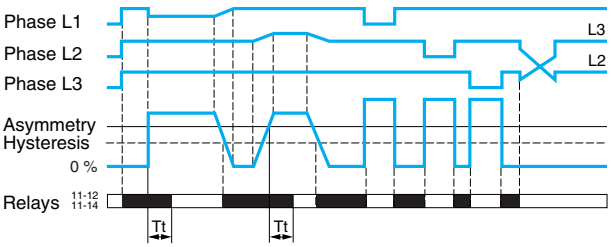
Un		208 V	220 V	380, 400, 415, 440 V	480 V
Voltage threshold (%)	U<	- 12 to - 2	- 17 to - 2	- 20 to - 2	- 20 to - 2
	U>	+ 2 to + 20	+ 2 to + 20	+ 2 to + 20	+ 2 to + 10

- In the event of a sequencing or phase failure fault, the relay opens instantly.
- In the event of an asymmetry or voltage fault, the relay opens at the end of the time delay set by the user. On energization of the device with a fault measured, the relay stays open.

Function diagrams

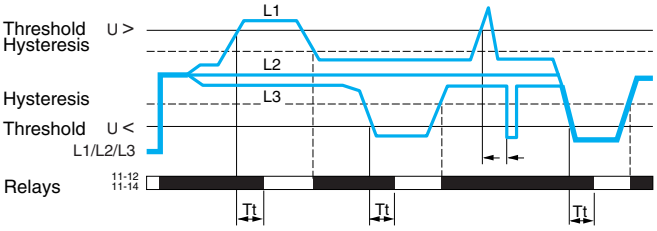
■ **Function:**

- Sequence of phases L1, L2, L3
- Phase failure
- Asymmetry, **Asy**



Tt: time delay after crossing of threshold (adjustable on front panel)

- Control of overvoltage and undervoltage in window mode, **>U / <U**



Tt: time delay after crossing of threshold (adjustable on front panel)

Environment characteristics			
Conforming to standards			NF EN 60255-6 and IEC 60255-6
Product certifications	Pending		UL (File E173076 CNN NRNT), CSA (File 217698 Guide 3211-07), GL, C-Tick, GOST
Marking			CE: 73/23/EEC and EMC 89/336/EEC, RoHS
Ambient air temperature around the device	Storage	**°F (°C)**	- 40 to 158 (- 40 to + 70)
	Operation	**°F (°C)**	- 4 to 122 (- 20 to + 50)
Permissible relative humidity	Conforming to IEC 60068-2-30		2 x 24 hours to + 95 % RH at + 131°F (55 °C) without condensation
Vibration resistance	Conforming to IEC 60068-2-6		0.035 mm from 10–150 Hz
Shock resistance	Conforming to IEC 60068-2-6		5 gn
Degree of protection Conforming to IEC 60529	Casing		IP 30
	Terminals		IP 20
Degree of pollution	Conforming to IEC 60664-1		3
Overvoltage category	Conforming to IEC 60664-1		III
Insulation resistance	Conforming to 60664-1/60255-5		> 500 MΩ, 500 Vdc
Rated insulation voltage	Conforming to IEC 60664-1	**V**	400
Insulation test voltage Conforming to IEC 60664-1/60255-5	Dielectric test	**kV**	2, 50 Hz, 1 min. on Vac
	Shock wave	**kV**	4 (1.2/50 µs)
Wire range Conforming to IEC 60947-1 and UL 508	Solid cable without cable end	**AWG (mm^2)**	One 14–20 (2.5–0.5) Two 16–20 (1.5–0.5
	Flexible cable with cable end	**AWG (mm^2)**	One 14–20 (2.5–0.5) Two 16–20 (1.5–0.5
Tightening torque	Conforming to IEC 60947-1 and UL 508		0.6–1 N.m / *5.3–8.8 lb-in*
Housing material			Self-extinguishing plastic
Power ON indicator			Green LED
Relay state indicator			Yellow LED (flashes during the time delay on crossing the threshold)
Mounting position without derating	In relation to normal vertical mounting plane		Any position
Mounting	Conforming to IEC/EN 60715		On 35 mm ⊓ rail
Supply characteristics			
Rated supply voltage Un		**Vac**	208–480
Operating range		**Vac**	183–528
Voltage limits	Of the power supply circuit		- 12 %, + 10 %
Frequency	Of the power supply circuit	**Hz**	50/60 Hz ± 10 %
Galvanic isolation, supply/measurement			No
Maximum power consumption at Un		**VA**	1.8 on Vac
Immunity to microbreaks		**ms**	10
Immunity to electromagnetic interference			
Electromagnetic compatibility			Immunity NF EN 61000-6-2 / IEC 61000-6-2 Emission NF EN 61000-6-4 NF EN 61000-6-3 IEC 61000-6-4 IEC 61000-6-3

Measurement circuit and input characteristics		
Measurement range	**Vac**	183–528
Phase-phase voltage selection	**V**	208, 220, 380, 400, 415, 440 , 480
Frequency of the measured signal		50–60 Hz ± 10 %
Maximum measuring cycle	**ms**	150/measurement as true rms value
Adjustment of voltage threshold		2–20 % of Un selected (- 2 to - 12 % in the range 3 x 208 Vac, - 2 to - 17 % in the range 3 x 220 Vac / + 2 to + 10 % in the range 3 x 480 Vac)
Fixed hysteresis		2 **%** of Un
Adjustment of asymmetry threshold		5–15 % of Un selected
Fixed hysteresis		2 **%** of Un
Setting accuracy		± 10 % of the full scale value
Repeat accuracy (with constant parameters)		± 0.5 **%**
Measurement error with voltage variation	**V**	< 1 % over the whole range
Measurement error with temperature variation		< 0.05 % / °C
Maximum regeneration (phase failure)		0.7 Un
Time delay characteristics		
Time delay on crossing the threshold	**s**	0.1–10, 0 + 10 %
Repeat accuracy (with constant parameters)		± 3 %
Reset time	**ms**	1500
Response time in the event of a fault	**ms**	< 200
Delay on pick-up	**ms**	500
Output characteristics		
Type of output		1 C/O contact
Contact type		Cadmium-free
Current rating—Resistive (Inductive)	**A**	5 (1 A at 24 Vdc, 5 A at 24 Vac, 3 A at 250 Vac)
Maximum switching voltage	**Vac/Vdc**	250
Rated breaking capacity	**VA**	1250
Minimum breaking current	**mA**	10/5 Vdc
Maximum breaking current	**A**	5 Vac/Vdc
Electrical durability ▲		1 x 10^5 operating cycles
Mechanical durability ▲		30 x 10^6 operating cycles
Maximum operating rate		360 operations/hour under full load
Utilization categories Conforming to IEC 60947-5-1		AC-12, AC-13, AC-14, AC-15, DC-12, DC-13

▲ The expected life expressed above is based on average usage and normal operating conditions. Actual operating life will vary with conditions. The above statements are not intended to nor shall they create any expressed or implied warranties as to product operation or life. For information on the listed warranty offered on this product, refer to the Square D Conditions of Sale found in the Digest.

Catalog numbers

105663

RM17TT00

105666

RM17TA00

105665

RM17TU00

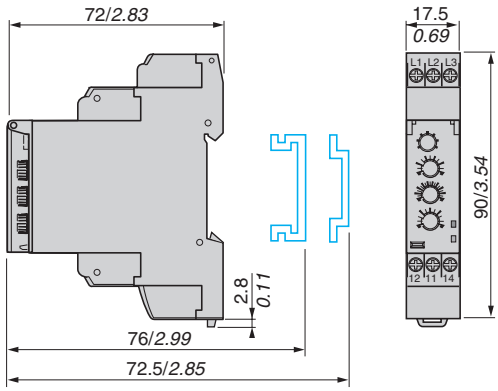
105667

RM17TE00

Function	Rated 3-phase supply voltage Vac	Output	Catalog numbers	Weight lb(kg)
• Phase sequence • Phase failure	208–480	1 C/O 5 A	**RM17TT00**	0.176 (0.080)
• Phase sequence • Phase failure • Asymmetry	208–480	1 C/O 5 A	**RM17TA00**	0.176 (0.080)
• Phase sequence • Phase failure • Undervoltage	208–480	1 C/O 5 A	**RM17TU00**	0.176 (0.080)
• Phase sequence • Phase failure • Asymmetry • Undervoltage and overvoltage in window mode	208–480	1 C/O 5 A	**RM17TE00**	0.176 (0.080)

Approximate dimensions

RM17T•00



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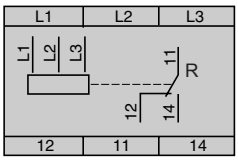
Wiring diagram

RM17T•00



105670

RM35TF30

Product description

Measurement and control relay RM35TF30 monitors the following on 3-phase supplies: the correct sequencing of phases L1, L2 and L3, failure of one or more of these phases, asymmetry, as well as overvoltage and undervoltage with independent settings.

Multi-voltage product.

This control relay accepts different nominal 3-phase voltage values: 220–480 Vac.

It monitors its own supply voltage, measured as a true rms value.

Settings are protected by a sealable cover.

Control status is indicated by an LED.

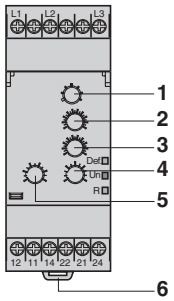
The relay is designed for clip-on mounting on ⊓ rail.

Applications

- Control of moving equipment (site equipment, agricultural equipment, refrigerated trucks)
- Control for protection of people and equipment against the consequences of reverse running (lifting, handling, elevators, escalators, etc.)
- Control of sensitive 3-phase supplies
- Protection against the risk of a driving load (phase failure)
- Normal/emergency power supply switching

Description

RM35TF



1 Voltage range selector switch (220, 380, 400, 415, 440 and 480 V)

2 Overvoltage setting potentiometer, **>U**

3 Undervoltage setting potentiometer, **<U**

4 Asymmetry threshold setting potentiometer, **Asy**

5 Time delay adjustment potentiometer, **Tt**

6 Spring for clip-on mounting on 35 mm ⊓ rai

Def.	Yellow LED: indicates fault present status (on for asymmetry, flashing for overvoltage and undervoltage). Def. (Detected Equipment Fault)
Un	Green LED: indicates that supply to the relay is on.
R	Yellow LED: indicates relay output state. • Relay is energized when the LED is illuminated. • Relay is de-energized when the LED is off.

Operating principle

3-phase supply control relay RM35TF30 monitors:

- The correct sequence of phases L1, L2, L3
- Phase failure
- Undervoltage and overvoltage in window mode:

Un		220 V	380, 400, 415, 440 V	480 V
Voltage threshold (%)	U<	- 12 to - 2	- 20 to - 2	- 20 to - 2
	U>	+ 2 to + 20	+ 2 to + 20	+ 2 to+ 10

- Asymmetry from 5–15% of the supply voltage Un
- Fault signalling is by LED

■ **Voltage selector switch:**

— Set the switch to the 3-phase supply voltage Un.

— The position of this switch is only taken into account on energization of the device.

— If the switch position is changed while the device is operating, all the LEDs flash, but the product continues to operate normally with the voltage selected at the time of energization preceding the change of position.

— The LEDs return to their normal state if the switch is returned to the original position selected prior to the last energization.

■ **The relay monitors its own supply voltage Un.**

- The relay monitors:

— correct sequence of the three phases

— failure of at least one of the three phases (U measured < 0.7 x Un)

— asymmetry, adjustable from 5 to 15% of Un

— the undervoltage, adjustable from - 2 to - 20% of Un (- 2 to - 12% in the range 3 x 220 Vac)

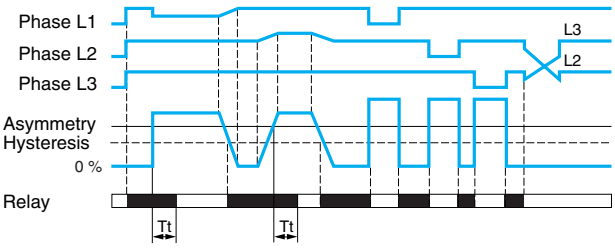
— the overvoltage, adjustable from + 2 to + 20% of Un (+ 2 to + 10% in the range 3 x 480 Vac due to the maximum voltage 528 Vac)

- In the event of a sequencing or phase failure fault, the relay opens instantly.
- In the event of an asymmetry or voltage fault, the relay opens at the end of the time delay set by the user.
- On energization of the device with a fault measured, the relay stays open.

Function diagrams

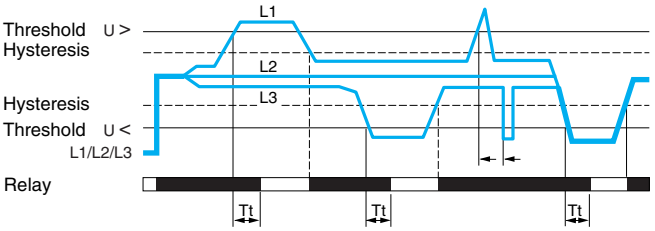
■ **Function:**

- Sequence of phases L1, L2, L3
- Phase failure
- Asymmetry



Tt: time delay after crossing of threshold (adjustable on front panel)

- Control of overvoltage and undervoltage in window mode, **U> / U<**



Tt: time delay after crossing of threshold (adjustable on front panel)

Environment characteristics			
Conforming to standards			NF EN 60255-6 and IEC 60255-6
Product certifications	Pending		UL (File E173076 CNN NRNT), CSA (File 217698 Guide 3211-07), GL, C-Tick, GOST
Marking			CE: 73/23/EEC and EMC 89/336/EEC, RoHS
Ambient air temperature around the device	Storage	**°F (°C)**	- 40 to 158 (- 40 to + 70)
	Operation	**°F (°C)**	- 4 to 122 (- 20 to + 50)
Permissible relative humidity	Conforming to IEC 60068-2-30		2 x 24 hours to + 95 % RH at + 131°F (55 °C) without condensation
Vibration resistance	Conforming to IEC 60068-2-6		0.035 mm from 10–150 Hz
Shock resistance	Conforming to IEC 60068-2-27		5 gn
Degree of protection	Casing		IP 30
Conforming to IEC 60529	Terminals		IP 20
Degree of pollution	Conforming to IEC 60664-1		3
Overvoltage category	Conforming to IEC 60664-1		III
Insulation resistance	Conforming to IEC 60664-1, 60255-5		> 500 MΩ, 500 Vdc
Rated insulation voltage	Conforming to IEC 60664-1	**V**	400
Insulation test voltage	Dielectric test	**kV**	2, 50 Hz, 1 min. on Vac
	Shock wave	**kV**	4
Mounting position without derating	In relation to normal vertical mounting plane		Any position
Wiring range Conforming to IEC3 60947-1 and UL 508	Solid cable without cable end	**AWG (mm^2)**	One 14–20 (2.5–0.5) Two 16–20 (1.5–0.5)
	Flexible cable with cable end	**AWG (mm^2)**	One 14–20 (2.5–0.5) Two 16–20 (1.5–0.5)
Tightening torque	Conforming to IEC 60947-1 and UL 508		0.6–1 N.m / *5.3–8.8 lb-in*
Housing material			Self-extinguishing plastic
Power ON indicator			Green LED (this LED is off in the event of phase failure)
Relay state indicator			Yellow LED (this LED flashes during the time delay on crossing the threshold)
Fault indication			Yellow LED this LED lights up in the event of asymmetry, this LED flashes in the event of overvoltage or undervoltage
Mounting	Conforming to IEC/EN 60715		On 35 mm ⊓ rail
Supply characteristics			
Rated supply voltage Un		**Vac**	3 x 220 to 3 x 480
Operating range		**Vac**	194–528
Voltage limits	Of the power supply circuit		- 12 %, + 10 %
Frequency	Of the power supply circuit		50/60 Hz ± 10 %
Galvanic isolation, supply/measurement			No
Maximum power consumption		**VA**	2.9 on Vac
Immunity to microbreaks		**ms**	10
Immunity to electromagnetic interference			
Electromagnetic compatibility			Immunity NF EN 61000-6-2 / IEC 61000-6-2 Emission NF EN 61000-6-4 NF EN 61000-6-3 IEC 61000-6-4 IEC 61000-6-3
Input and measurement circuit characteristics			
Measurement range		**Vac**	194–528
Phase-phase voltage selection		**V**	220, 380, 400, 415, 440, 480
Guaranteed detection threshold for phase failure		**V**	194
Frequency of the measured signal		**Hz**	50–60 ± 10 %
Maximum measuring cycle		**ms**	140/measurement as true rms value
Adjustment of voltage threshold			2–20 % of Un selected (- 12 to - 2 % in the range 3 x 220 Vac and - 20 to - 2 % in the ranges 3 x 380–480 Vac) (+ 2 to + 20 % in the ranges 3 x 220–440 Vac and + 2 to + 10 % in the range 3 x 480 Vac)
Fixed hysteresis			2 % of Un
Adjustment of asymmetry threshold			5–15 % of Un selected
Setting accuracy			± 10 % of the threshold setting (of the full scale value)
Repeat accuracy (with constant parameters)			± 0.5 %
Measurement error with voltage variation			< 1 % over the whole range
Measurement error with temperature variation			0.05 % / °C

Time delay characteristics		
Time delay on crossing the threshold	**s**	0.1–10. 0 + 10 %
Repeat accuracy (with constant parameters)		± 0.3 %
Reset time	**ms**	1500 max at 480 V
Response time in the event of a fault	**ms**	< 200
Delay on pick-up	**ms**	500

Output characteristics		
Type of output		2 C/O contacts
Contact type		Cadmium-free
Maximum switching voltage	**Vac/Vdc**	250
Rated breaking capacity	**VA**	1250
Current rating—Resistive (Inductive)	**A**	5 (1 A at 24 Vdc, 5 A at 24 Vac, 3 A at 250 Vac)
Minimum breaking current	**mA**	10 /5 Vdc
Mechanical durability ▲		30 x 10^6 operating cycles
Electrical durability ▲		1 x 10^5 operating cycles
Maximum operating rate		360 operations/hour under full load
Utilization categories Conforming to IEC 60947-5-1		AC-12, AC-13, AC-14, AC-15, DC-12, DC-13

▲ The expected life expressed above is based on average usage and normal operating conditions. Actual operating life will vary with conditions. The above statements are not intended to nor shall they create any expressed or implied warranties as to product operation or life. For information on the listed warranty offered on this product, refer to the Square D Conditions of Sale found in the Digest.

Catalog number

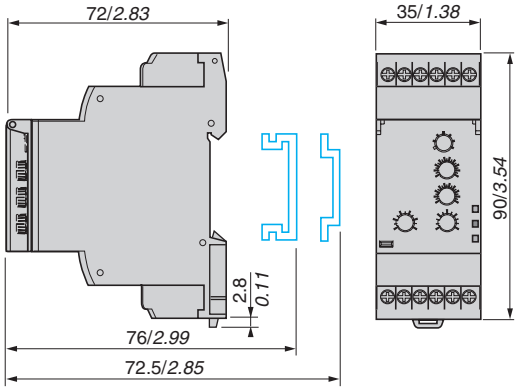
105670

RM35TF30

Function	Rated 3-phase supply voltage Vac	Output	Catalog number	Weight lb(kg)
• Phase sequence • Phase failure • Asymmetry • Undervoltage and overvoltage in window mode	220–480	2 C/O 5 A	**RM35TF30**	0.286 (0.130)

Approximante dimensions

RM35TF30



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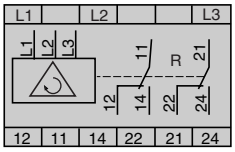
Wiring diagram

RM35TF30



106439

RM35TM●●●MW

Product description

Motor temperature measurement and control relays RM35TM50MW and RM35TM250MW monitor the following, on 3-phase supplies: correct sequencing of phases L1, L2 and L3, phase failure, and motor temperature via PTC probes (with or without memory).

The phase and temperature control functions are independent of each other.

These control relays accept different nominal 3-phase voltage values: 208–480 Vac.

They also detect line breaks or short-circuiting of the probes.

A version with fault memory and Test/Reset function is available.

Settings are protected by a sealable cover.

Control status is indicated by an LED.

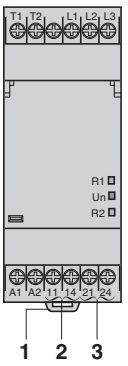
The relays are designed for clip-on mounting on ⊓ rail.

Applications

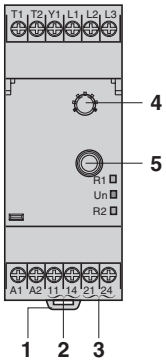
- Control of moving equipment (site equipment, agricultural equipment, refrigerated trucks)
- Control for protection of people and equipment against the consequences of reverse running (lifting, handling, elevators, escalators, etc.)
- Control of sensitive 3-phase supplies
- Protection against the risk of a driving load (phase failure/back EMF)
- Normal/emergency power supply switching

Description

RM35TM50MW



RM35TM250MW



1 Spring for clip-on mounting on 35 mm ⊓ rail

2 Temperature contact (11-14)

3 Phase contact (21-24)

4 Configuration: selection of temperature control operating mode (with or without memory).
Memory - No Memory

5 Pushbutton (activation of temperature control)
Test/Reset

R1	Yellow LED: temperature relay state indicato.
Un	Green LED: power ON indicator
R2	Yellow LED: phase relay state indicator

Operating principle

Relays RM35TM50MW and RM35TM250MW monitor:

- The status of the 3-phase supply
- The temperature of motors with embedded PTC probes

The phase and temperature control functions are independent of each other

The 3-phase supply control function (208–480 V) monitors:

- The correct sequence of phases L1, L2, L3
- Total failure of a phase, including the case of regeneration (asymmetry greater than 30% of the average of the three phases)

Phase and temperature control relays: RM35TM50MW and RM35TM250MW

■ 3-phase supply control

As soon as phase sequence (L1, L2, L3) and phase presence (symmetry of their amplitude < 30%) are correct, the output relay contact closes and LED R2 illuminates.

In the event of total failure or drop in amplitude of a phase (phase failure with regeneration) or inversion of phase sequence, the output relay contact opens and LED R2 goes out.

The result of the control is indicated by the status of output relay R2. N.O. contact 21-24 opens in the event of a fault.

■ Temperature control

The temperature control relay can take up to 6 PTC (positive temperature coefficient) probes wired in series between terminals T1 and T2.

A fault is declared when the resistance of the temperature sensing circuit exceeds 3100 Ω.

Return to normal status is detected when the resistance is once again below 1650 Ω.

The result of the control is indicated by the status of the temperature output relay. N.O. contact 11-14 opens in the event of a fault.

Opening of the thermal sensing circuit, which has the same effect as a high temperature (resistance exceeds 3100 Ω) is therefore interpreted as a fault.

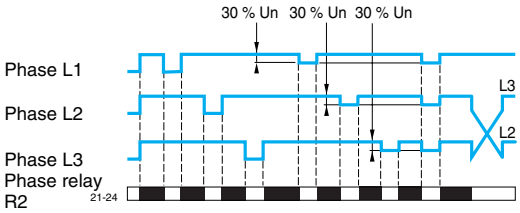
Total short-circuiting of the temperature probe(s), detected when resistance is less than 15 Ω ± 5 Ω, is treated as a fault.

LED R1 illuminates when the temperature is correct.

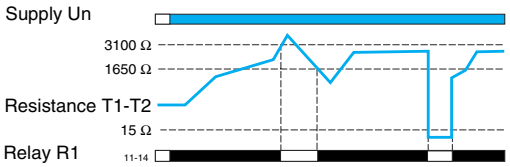
Function diagrams

■ Function:

- Sequence of phases L1, L2, L3
- Total phase failure



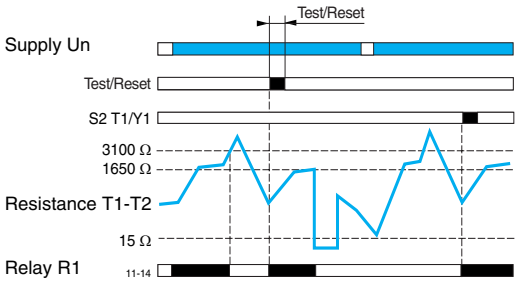
- Motor temperature control via PTC probe



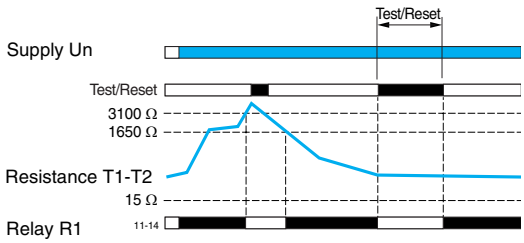
Function diagrams

■ **Function:**

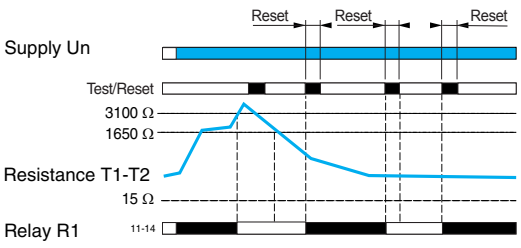
- Motor temperature control via PTC probe
  With Memory



- Use of the Test/Reset button
  Without Memory



- **With Memory**



Phase and temperature control relay (with or without memory): RM35TM250MW

Configuration

The configuration is taken into account when relay RM35TM250MW is energized.

Selection of operating mode:
Set the switch to the required operating mode:

- Temperature control without memory
- Temperature control with memory

On energization, placing the switch in one of the five intermediate positions holds the relay in the open contact state and the error is signalled by simultaneous flashing of the LEDs.

The position of the mode selector switch is taken into account on energization. Any modification of its position during operation has no effect. The active configuration may therefore be different from that indicated by the switch. In this case, the RM35TM250MW operates normally but the fact that the configuration has been changed is signalled by simultaneous flashing of the three LEDs.

■ **Memory**

Relay version RM35TM250MW has a selector switch which allows the temperature control operating mode to be configured with or without memory.

In memory mode, when a fault is detected, the temperature relay locks in the open position.

As soon as the temperature returns to the correct value, the relay can be unlocked (reset), either by pressing the Test/Reset button (for at least 50 ms), or by closing a volt-free contact (for at least 50 ms) between terminal Y1 and T1 (without a parallel load).

Relay RM35TM250MW can also be reset by switching the power off then on (see reset time).

■ **Use of the Test/Reset button**

Relay version RM35TM250MW has a Test/Reset button which can be used to check that the temperature control function is working correctly and to reset this function after locking in memory mode.

The press and release times are 50 ms for both functions.

When the temperature is normal, pressing the Test/Reset button simulates overheating. The temperature output relay contact opens and the no fault LED goes off.

If memory mode is not active, the fault indication is maintained for as long as the button is pressed.

If memory mode is active, fault indication is locked and the button must be released then pressed again to reset the function.

In memory mode, when a fault is detected and the temperature returns to normal, the temperature control relay can be unlocked (reset) by pressing the Test/Reset button.

Environment characteristics			
Conforming to standards			NF EN 60255-6, IEC 60255-6 and IEC 60034-11-2
Product certifications	Pending		UL (File E173076 CNN NRNT), CSA (File 217698 Guide 3211-07), GL, C-Tick, GOST
Marking			CE: 73/23/EEC and EMC 89/336/EEC, RoHS
Ambient air temperature around the device	Storage	**°F (°C)**	- 40 to 158 (- 40 to + 70)
	Operation	**°F (°C)**	- 4 to 122 (- 20 to + 50)
Permissible relative humidity	Conforming to IEC 60068-2-30		2 x 24 hours to + 95 % RH at 131 °F (+ 55 °C) without condensation
Vibration resistance	Conforming to IEC 60068-2-6		0.035 mm from 10–150 Hz
Shock resistance	Conforming to IEC 60068-2-6		5 gn
Degree of protection	Casing		IP 30
Conforming to IEC 60529	Terminals		IP 20
Degree of pollution	Conforming to IEC 60664-1		3
Overvoltage category	Conforming to IEC 60664-1		III
Insulation resistance	Conforming to 60664-1/60255-5		> 500 MΩ, 500 Vdc
Rated insulation voltage	Conforming to IEC 60664-1	**V**	400
Insulation test voltage	Dielectric test	**kV**	2, 50 Hz, 1 min. on Vac
	Shock wave	**kV**	4 (1.2/50 µs)
Mounting position without derating	In relation to normal vertical mounting plane		Any position
Wiring range Conforming to IEC3 60947-1 and UL 508	Solid cable without cable end	**AWG (mm^2)**	One 14–20 (2.5–0.5) Two 16–20 (1.5–0.5)
	Flexible cable with cable end	**AWG (mm^2)**	One 14–20 (2.5–0.5) Two 16–20 (1.5–0.5)
Tightening torque	Conforming to IEC 60947-1 and UL 508		0.6–1 N.m / *5.3–8.8 lb-in*
Housing material			Self-extinguishing plastic
Power ON indicator			Green LED
Relay state indicators	R1 (temperature)		Yellow LED (flashes during the time delay on crossing the threshold)
	R2 (phase)		Yellow LED
Mounting	Conforming to IEC/EN 60715		On 35 mm ⊓ rail
Supply characteristics			
Rated supply voltage Un		**Vac/Vdc**	24–240
Operating range		**Vac/Vdc**	20.4–264
Frequency	Of the power supply circuit		50/60 Hz ± 10 %
Galvanic isolation, supply/measurement			No (current limitation)
Maximum power consumption		**VA**	4 on Vac / 0.5 W on Vdc
Immunity to microbreaks			20 ms at 20.4 V
Immunity to electromagnetic interference			
Electromagnetic compatibility			Immunity NF EN 61000-6-2 / IEC 61000-6-2 Emission NF EN 61000-6-4 NF EN 61000-6-3 IEC 61000-6-4 IEC 61000-6-3
Input and 3-phase measurement circuit characteristics			
Measurement range		**Vac**	208–480
Operating range		**Vac**	176–528
Frequency of the measured signal			50–60 Hz ± 10 %
Input resistance		**kΩ**	602/line

Output characteristics			
Type of output			2 N.O. contacts
Contact type			Cadmium-free
Maximum switching voltage		**Vac/Vdc**	250
Rated breaking capacity		**VA**	1250
Minimum breaking current		**mA**	10/5 Vdc
Current rating—Resistive (Inductive)		**A**	5 (1 A at 24 Vdc, 5 A at 24 Vac, 3 A at 250 Vac)
Electrical durability ▲			1 x 10^4 operating cycles
Mechanical durability ▲			30 x 10^6 operating cycles
Maximum operating rate			360 operations/hour under full load
Utilization categories	Conforming to IEC 60947-5-1		AC-12, AC-13, AC-14, AC-15, DC-12, DC-13
Time delay on crossing the threshold	Phases	**ms**	300
	Temperature	**ms**	300
Response time input Y1 (contact Y1-T1) **and pushbutton**		**ms**	50
Reset time		**ms**	10 000
Delay on pick-up		**ms**	500
Temperature control characteristics			
Maximum voltage of temperature control circuit		**V**	3.6 (T1-T2 open)
Temperature sensing circuit short-circuit current		**mA**	7 (T1-T2 short-circuited)
Maximum resistance of temperature sensor at 68 °F (20°C)		Ω	1500
Tripping threshold		Ω	3100 ± 10 %
Reset threshold		Ω	1650 ± 10 %
Circuit short-circuit detection range		Ω	0—15 ± 5

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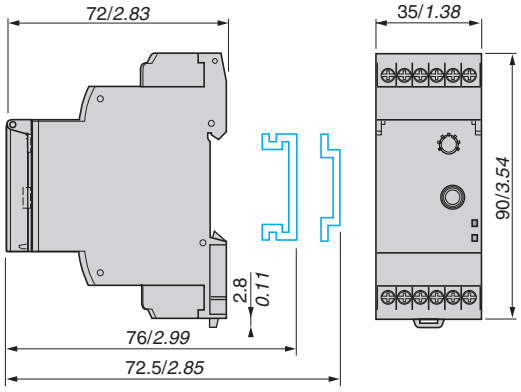
Catalog numbers

	Function	Supply voltage	Rated 3-phase supply voltage	Output	Catalog numbers	Weight
		Vac/Vdc	Vac			lb(kg)
106439  RM35TM50MW	• Phase sequence • Phase failure • Motor temperature via PTC probe	24–240	208–480	2 N.O. 5 A	**RM35TM50MW**	0.264 (0.120)
105672  RM35TM250MW	• Phase sequence • Phase failure • Motor temperature via PTC probe • Selection (with or without memory) • Test/Reset button	24–240	208–480	2 N.O. 5 A	**RM35TM250MW**	0.264 (0.120)

Approximate dimensions

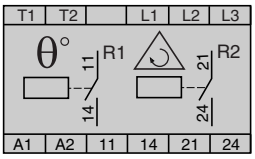
RM35TM●●MW



mm/*In.*

Wiring diagram

RM35TM●●MW



RM35UB3●●●

RM17UB310

Product description

Voltage measurement and control relays RM35UB330, RM17UB310, and RM35UB3N30 monitor the following, on 3-phase supplies:

Function performed	RM35UB330	RM17UB310	RM35UB3N30
Failure of one or more phases	Yes	Yes	Yes
Absence of neutral	No	No	Yes
Overvoltage and undervoltage	Yes	Yes	Yes
Voltage between phases	Yes (220–480 V)	Yes (208–480 V)	No
Voltage between phases and neutral	No	No	Yes (120–277 V)

They monitor their own supply voltage, measured as a true rms value.

Settings are protected by a sealable cover.

Control status is indicated by an LED.

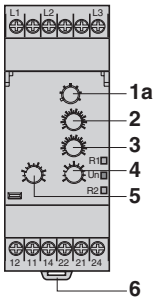
The relays are designed for clip-on mounting on ⊓ rail.

Applications

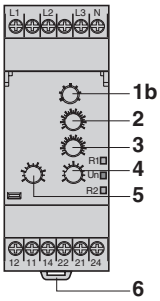
- Control of moving equipment (site equipment, agricultural equipment, refrigerated trucks)
- Control for protection of people and equipment against the consequences of reverse running (lifting, handling, elevators, escalators, etc.)
- Control of sensitive 3-phase supplies
- Protection against the risk of a driving load (phase failure/back EMF)
- Normal/emergency power supply switching

Description

RM35UB330



RM35UB3N30



1a Voltage range selector switch (220, 380, 400, 415, 440 and 480 V)

1b Voltage range selector switch (120, 127, 220, 230, 240, 260 and 277 V)

2 Overvoltage setting potentiometer, **>U**

3 Undervoltage setting potentiometer, **<U**

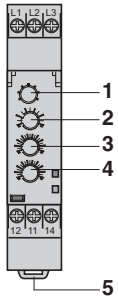
4 Undervoltage threshold delay setting potentiometer, **Tt2**

5 Overvoltage threshold delay setting potentiometer, **Tt1**

6 Spring for clip-on mounting on 35 mm ⊓ rail.

Un	Green LED: indicates that supply to the relay is on.
R1	Yellow LED: indicates relay output state. High voltage threshold.
R2	Yellow LED: indicates relay output state. Low voltage threshold.

RM17UB310



1 Voltage range selector switch (208, 220, 380, 400, 415, 440 and 480 V)

2 Time delay adjustment potentiometer,**Tt**

3 Overvoltage setting potentiometer, **>U**

4 Undervoltage setting potentiometer, **<U**

5 Spring for clip-on mounting on 35 mm ⊓ rail

Un	Green LED: indicates that supply to the relay is on.
R	Yellow LED: indicates relay output state.

Operating principle

3-phase voltage control relays monitor:

■ **Undervoltage and overvoltage:**

Un Phase/phase		208 V	220 V	380, 400, 415, 440 V	480 V
RM17UB310	> U (%)	+ 2 to + 20	+ 2 to + 20	+ 2 to + 20	+ 2 to + 10
	< U (%)	- 12 to - 2	- 17 to - 2	- 20 to - 2	- 20 to - 2
RM35UB30	> U (%)	–	+ 2 to + 20	+ 2 to + 20	+ 2 to + 10
	< U (%)	–	- 12 to - 2	- 20 to - 2	- 20 to - 2
Un Phase/neutral		**120 V**	**127 V**	**220, 230, 240, 260 V**	**277 V**
RM35UB3N30	> U (%)	+ 2 to + 20	+ 2 to + 20	+ 2 to + 20	+ 2 to + 20
	< U (%)	- 20 to - 2	- 20 to - 2	- 20 to - 2	- 20 to - 2

■ **Failure of one or more phases,**

- The presence of neutral (RM35UB3N30 only)

Measurements are made between Phases/Phases for the RM35UB330 and the RM17UB310 and between Phases/Neutral for the RM35UB3N30.

Fault signalling is by LED. RM35UB relays allow differentiation on the source of the fault (one LED for high threshold, one LED for low threshold).

■ **Voltage selector switch:**

- Set the switch to the 3-phase supply voltage Un.
- The position of this switch is only taken into account on energization of the device.
- If the switch position is changed while the device is operating, all the LEDs flash, but the product continues to operate normally with the voltage selected at the time of energization preceding the change of position.

The LEDs return to their normal state if the switch is returned to the original position selected prior to the last energization.

Overvoltage/undervoltage control relays: RM35UB330

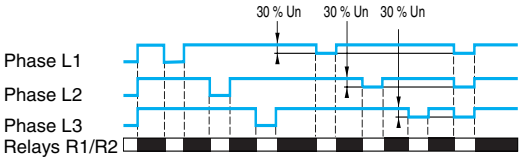
The relay monitors its own supply voltage Un.

- The relay monitors:
  - — failure of at least one of the three phases (U measured < 0.7 x Un)
  - — the undervoltage
  - — the overvoltage
- Each threshold has its own independently adjustable time delay from 0.3 to 30 s.
- In the event of a voltage fault, the corresponding relay (one undervoltage output / one overvoltage output) opens at the end of the time delay set by the user.
- In the event of phase failure, both relays open instantly without waiting for the end of the time delay set by the user.
- On energization of the device with a fault measured, the relays stay open.

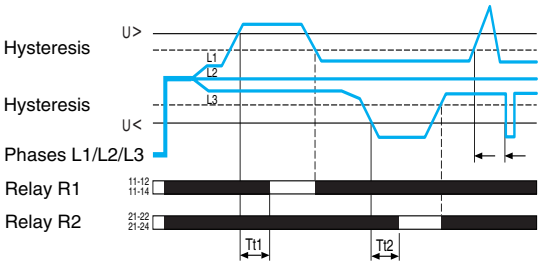
Function diagrams

■ **Functions:**

- Phase failure



- Overvoltage and undervoltage



Tt1: overvoltage threshold delay (adjustable on front panel)

Tt2: undervoltage threshold delay (adjustable on front panel)

Overvoltage/undervoltage + absence of neutral control relay: RM35UB3N30

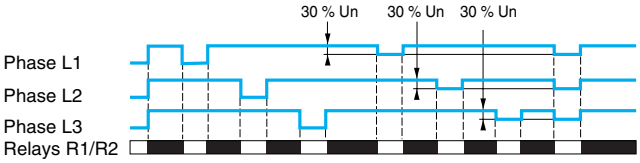
The relay monitors its own supply voltage Un.

- The relay monitors:
  - — the presence of neutral
  - — the undervoltage
  - — the overvoltage
  - — phase failure
- Each threshold has its own independently adjustable time delay from 0.3 to 30 s.
- In the event of a voltage fault, the corresponding relay (one undervoltage output/one overvoltage output) opens at the end of the time delay set by the user.
- In the event of absence of neutral or phase, both relays open instantly without waiting for the end of the time delay set by the user.
- On energization of the device with a fault measured, the relays stay open.

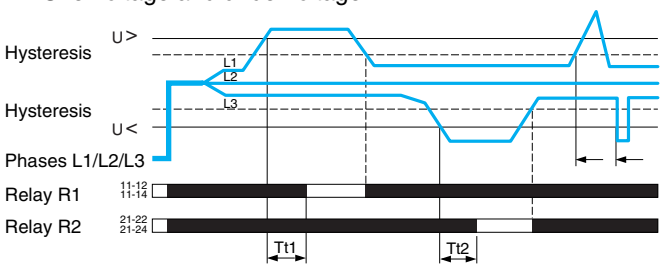
Function diagrams

■ **Functions:**

- Phase failure



- Overvoltage and undervoltage



Tt1: overvoltage threshold delay (adjustable on front panel)

Tt2: undervoltage threshold delay (adjustable on front panel)

Overvoltage/undervoltage control relay: RM17UB310

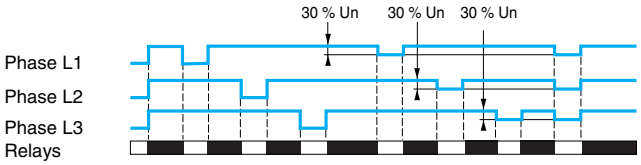
The relay monitors its own supply voltage Un.

- The relay monitors:
  - — the undervoltage
  - — the overvoltage
  - — phase failure
- An adjustable time delay from 0.3 to 30 s allows inhibition of the output relay if a transient fault occurs.
- In the event of a voltage fault, the relay opens at the end of the time delay set by the user.
- On energization of the device with a fault measured, the relay stays open.
- In the event of phase failure, the relay opens instantly.

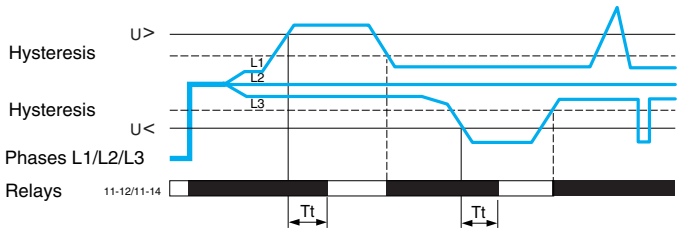
Function diagrams

■ **Functions:**

- Phase failure



- Overvoltage and undervoltage



Tt: overvoltage and undervoltage threshold delay (adjustable on front panel)

Environment characteristics					
Conforming to standards			NF EN 60255-6 and IEC 60255-6		
Product certifications	Pending		UL (File E173076 CNN NRNT), CSA (File 217698 Guide 3211-07), GL, C-Tick, GOST		
Marking			CE: 3/23/EEC and EMC 89/336/EEC, RoHS		
Ambient air temperature around the device	Storage	**°F (°C)**	- 40 to 158 (- 40 to + 70)		
	Operation	**°F (°C)**	- 4 to 122 (- 20 to + 50)		
Permissible relative humidity	Conforming to IEC 60068-2-30		2 x 24 hours to + 95 % RH at + 131°F (55 °C) without condensation		
Vibration resistance	Conforming to IEC 60068-2-6		0.035 mm from 10–150 Hz		
Shock resistance	Conforming to IEC 60068-2-27		5 gn		
Degree of protection	Casing		IP 30		
Conforming to IEC 60529	Terminals		IP 20		
Degree of pollution	Conforming to IEC 60664-1		3		
Overvoltage category	Conforming to IEC 60664-1		III		
Insulation resistance	Conforming to IEC 60664-1, 60255-5		> 500 MΩ, 500 Vdc		
Rated insulation voltage	Conforming to IEC 60664-1	**V**	400		
Insulation test voltage	Dielectric test	**kV**	2, 50 Hz, 1 min. on Vac		
	Shock wave	**kV**	4		
Mounting position without derating	In relation to normal vertical mounting plane		Any position		
Wiring range. Conforming to IEC 60947-1 and UL 508	Solid cable without cable end	**AWG (mm^2)**	One 14–20 (2.5–0.5) Two 16–20 (1.5–0.5)		
	Flexible cable with cable end	**AWG (mm^2)**	One 14–20 (2.5–0.5) Two 16–20 (1.5–0.5)		
Tightening torque	Conforming to IEC 60947-1 and UL 508		0.6–1 N.m / *5.3–8.8 lb-in*		
Housing material			Self-extinguishing plastic		
Power ON indicator			Green LED		
Relay state indicator			Yellow LED		
Mounting	Conforming to IEC/EN 60715		On 35 mm ⊓ rail		
Supply characteristics					
Relay type			**RM35UB330**	**RM35UB3N30**	**RM17UB310**
Rated supply voltage Un		**Vac**	3 x 220 to 3 x 480	3 x 120 to 3 x 277	3 x 208 to 3 x 480
Operating range		**Vac**	194–528	114–329	183–528
Frequency	Of the power supply circuit		50/60 Hz ± 10 %		
Galvanic isolation, supply/measurement			No		
Maximum power consumption		**VA**	2.9 on Vac	3.9 on Vac	1.8 on Vac
Immunity to microbreaks		**ms**	50	5	80
Immunity to electromagnetic interference					
Electromagnetic compatibility			Immunity NF EN 61000-6-2 / IEC 61000-6-2 Emission NF EN 61000-6-4 NF EN61000-6-3 IEC 61000-6-4 IEC 61000-6-3		
Input and measurement circuit characteristics					
Measurement range		**Vac**	194–528	114–329	183–528
Phase failure detection threshold		**V**	194	114	183
Frequency of the measured signal		**Hz**	50–60 ± 15 %	50–60 ± 15 %	50–60 ± 10 %
Maximum measuring cycle		**ms**	150/measurement as true rms value		
Fixed hysteresis			2 **%** Un		
Setting accuracy			± 10 % of the full scale value		
Repeat accuracy (with constant parameters)			± 0.5 %		
Measurement error with voltage variation			< 1 % over the whole range		
Measurement error with temperature variation			0.05 % / °C		
Time delay characteristics					
Delay on crossing the threshold		**s**	0.3–30, 0 + 10 %		
Repeat accuracy (with constant parameters)			± 1 %		
Reset time		**ms**	1500		
Response time in the event of a fault		**ms**	< 200		
Delay on pick-up		**ms**	500		

Output characteristics

Relay type		RM35UB330	RM35UB3N30	RM17UB310
Output type		1 C/O + 1 C/O contacts		1 C/O contact
Contact type		Cadmium-free		
Maximum switching voltage	**Vac/Vdc**	250		
Rated breaking capacity	**VA**	1250		
Current rating—Resistive (Inductive)	**A**	5 (1 A at 24 Vdc, 5 A at 24 Vac, 3 A at 250 Vac)		
Minimum breaking current	**mA**	10/5 Vdc		
Mechanical durability ▲		30 x 10^6 operating cycles		
Electrical durability ▲		1 x 10^4 operating cycles		1 x 10^5 operating cycles
Maximum operating rate		360 operations/hour under full load		
Utilization categories Conforming to IEC 60947-5-1		AC-12, AC-13, AC-14, AC-15, DC-12, DC-13, DC-14		

▲ The expected life expressed above is based on average usage and normal operating conditions. Actual operating life will vary with conditions. The above statements are not intended to nor shall they create any expressed or implied warranties as to product operation or life. For information on the listed warranty offered on this product, refer to the Square D Conditions of Sale found in the Digest.

Catalog numbers

106438

RM35UB330

105664

RM17UB310

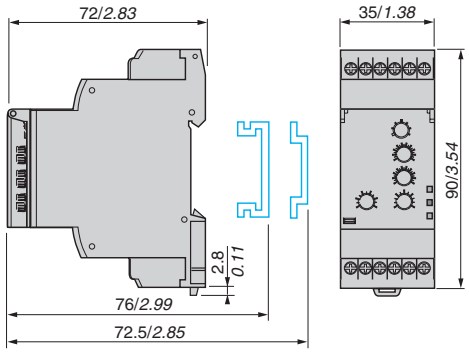
105669

RM35UB3N30

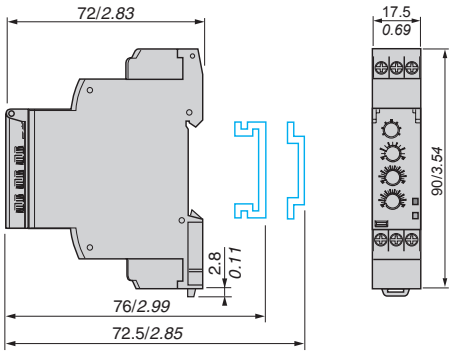
Function	Rated 3-phase supply voltage Vac	Output	Catalog numbers	Weight lb(kg)
• Overvoltage and undervoltage between phases	220–480 (Phase-phase)	1 C/O +1 C/O 1 per threshold 5 A	**RM35UB330**	0.286 (0.130)
	208–480 (Phase-phase)	1 C/O 5 A	**RM17UB310**	0.176 (0.080)
• Overvoltage and undervoltage between phases and neutral • Absence of neutral	120–277 (Phase-neutral)	1 C/O +1 C/O 1 per threshold 5 A	**RM35UB3N30**	0.286 (0.130)

Approximate dimensions

RM35UB330, RM35UB3N30



RM17UB310



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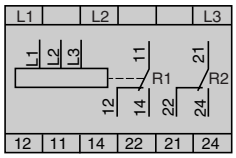
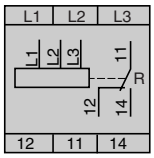
Wiring diagrams

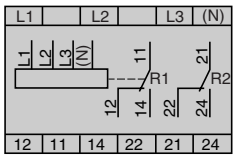
RM35UB330



RM17UB310



RM35UB3N30



106442

RM17UAS●●

106444

RM17UBE●●

Product description

Single-phase and d.c. voltage measurement and control relays RM17UAS●● and RM17UBE●● monitor:

Function performed RM17	UAS14	UAS15	UAS16	UBE15	UBE16
Overvoltage	Yes	Yes	Yes	No	No
Undervoltage	Yes	Yes	Yes	No	No
Overvoltage and undervoltage (window mode)	No	No	No	Yes	Yes
Nominal voltages	12 Vdc	110–240 Vac/Vdc	24–48 Vac/Vdc	110–240 Vac/Vdc	24–48 Vac/Vdc

They allow selection of operating mode.

They monitor their own supply voltage, measured as a true rms value.

Settings are protected by a sealable cover.

Control status is indicated by an LED.

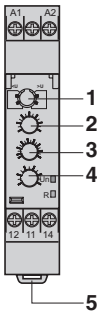
The relays are designed for clip-on mounting on ⊓ rail.

Applications

- Protection of electronic or electromechanical devices against overvoltage and undervoltage
- Normal/emergency power supply switching

Description

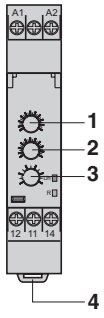
RM17UAS●●



1 Configuration: selection of operating mode **<U / >U** (with or without memory) **Memory - No Memory**
2 Setting potentiometer
3 Hysteresis adjustment potentiometer, **H**
4 Time delay setting potentiometer, **Tt**
5 Spring for clip-on mounting on 35 mm ⊓ rail.

Un	Green LED: indicates that supply to the relay is on.
R	Yellow LED: indicates relay output state.

RM17UBE1●



1 Maximum voltage range selection and setting potentiometer
2 Minimum voltage range selection and setting potentiometer
3 Time delay setting potentiometer, **Tt**
4 Spring for clip-on mounting on 35 mm ⊓ rail

Un	Green LED: indicates that supply to the relay is on.
R	Yellow LED: indicates relay output state.

Operating principle

Voltage control relays RM17UAS and RM17UBE monitor:

- The voltages of single-phase and d.c. supplies

These products monitor their own supply voltage.

RM17UAS●● relays give the user a choice of two operating modes:

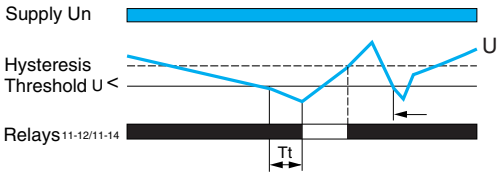
- Overvoltage or undervoltage
- Fault memory selected or not

An adjustable time delay, on crossing the thresholds, provides immunity to transients, thus preventing spurious triggering of the output relay.

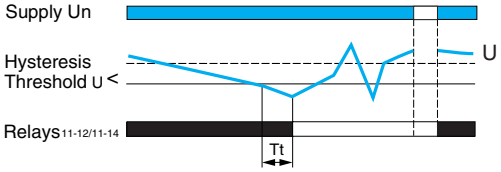
Fault signalling is by LED.

Function diagrams

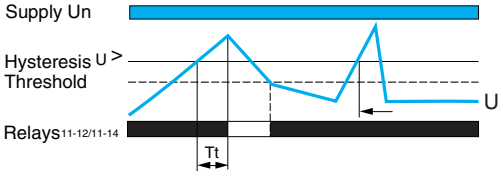
- Function: Undervoltage control, **<U**
- **Without Memory**



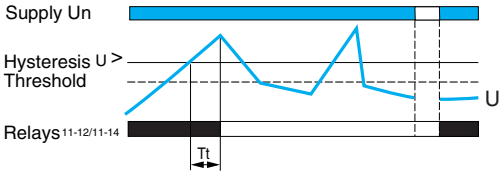
- **With Memory**



- Function: Overvoltage control **>U**
- **Without Memory**



- **With Memory**



Tt: time delay after crossing of threshold

Overvoltage or undervoltage control relays: RM17UAS14, RM17UAS15 and RM17UAS16

The operating mode is fixed by the user:

A switch allows selection between the following modes:

- Undervoltage with or without memory
- Overvoltage with or without memory

The position of the switch, and therefore the operating mode, is read by the product on energization.

If the switch is set to an unacceptable position, the product detects a fault, the output relay stays open, and the LEDs flash to signal the position error.

If the switch position is changed while the device is operating, all the LEDs flash, but the product continues to operate normally with the function selected at the time of energization preceding the change of position.

The LEDs return to their normal state if the switch is returned to the original position selected prior to the last energization.

The undervoltage or overvoltage threshold value is set by means of a graduated potentiometer clearly indicating the **Un** to be monitored.

The hysteresis is adjusted by means of a potentiometer graduated from 5–20% of the threshold setting. The hysteresis value must not exceed the limit values of the measuring range.

If the voltage controlled exceeds the threshold setting for a time greater than that set on the front panel (0.1–10 s), the output relay opens and LED R goes out.

As soon as the voltage returns to a value above (or below) the threshold setting minus (or respectively plus) the hysteresis, the relay instantly closes.

Memory mode

If Memory mode is selected, the relay opens when crossing of the threshold is detected and then stays in that position.

The power must be switched off to reset the product.

Overvoltage and undervoltage control relays: RM17UBE15 and RM17UBE16

Relays RM17UBE operate in window mode. They check that the voltage controlled stays between a minimum threshold and a maximum threshold.

The undervoltage or overvoltage threshold values are set by means of two graduated potentiometers clearly indicating the Un to be monitored.

The hysteresis is fixed at 3% of the threshold setting.

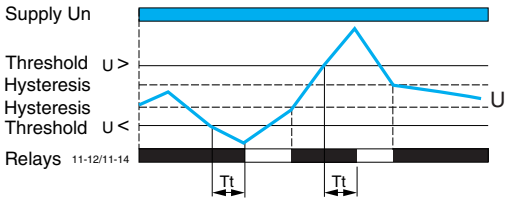
If the voltage controlled exceeds the high threshold setting, or falls below the low threshold setting for a time greater than that set on the front panel (0.1–10 s), the output relay opens and LED R goes out. During the time delay, this LED flashes.

As soon as the voltage falls below the high threshold setting value minus the hysteresis, or rises above the low threshold setting value plus the hysteresis, the relay instantly closes.

On energization of the device with a fault measured, the relay stays open.

Function diagrams

- Function: Control of overvoltage and undervoltage in window mode, **U> / U<**



Tt: time delay after crossing of threshold

Environment characteristics

Conforming to standards			NF EN 60255-6 and IEC 60255-6
Product certifications	Pending		UL (File E173076 CNN NRNT), CSA (File 217698 Guide 3211-07), GL, C-Tick, GOST
Marking			CE: 73/23/EEC and EMC 89/336/EEC, RoHS
Ambient air temperature around the device	Storage	**°F (°C)**	- 40 to 158 (- 40 to + 70)
	Operation	**°F (°C)**	- 4 to 122 (- 20 to + 50)
Permissible relative humidity	Conforming to IEC 60068-2-30		2 x 24 hours to + 95 % RH at + 131°F (55 °C) without condensation
Vibration resistance	Conforming to IEC 60068-2-6		0.035 mm from 10–150 Hz
Shock resistance	Conforming to IEC 60068-2-6		5 gn
Degree of protection	Casing		IP 30
Conforming to IEC 60529	Terminals		IP 20
Degree of pollution	Conforming to IEC 60664-1		3
Overvoltage category	Conforming to IEC 60664-1		III
Insulation resistance	Conforming to 60664-1/60255-5		> 500 MΩ, 500 Vdc
Rated insulation voltage	Conforming to IEC 60664-1	**V**	250 or 400
Insulation test voltage	Dielectric test	**kV**	2, 50 Hz, 1 min. on Vac
Conforming to IEC 60664-1/60255-5	Shock wave	**kV**	4 (1.2/50 µs)
Wiring range Conforming to IEC 60947-1 and UL 508	Solid cable without cable end	**AWG (mm^2)**	One 14–20 (2.5–0.5) Two 16–20 (1.5–0.5)
	Flexible cable with cable end	**AWG (mm^2)**	One 14–20 (2.5–0.5) Two 16–20 (1.5–0.5)
Tightening torque	Conforming to IEC 60947-1 and UL 508		0.6–1 N.m / *5.3–8.8 lb-in*
Housing material			Self-extinguishing plastic
Power ON indicator			Green LED
Relay state indicator			Yellow LED (flashes during the time delay on crossing the threshold)
Mounting position without derating	In relation to normal vertical mounting plane		Any position
Mounting	Conforming to IEC/EN 60715		On 35 mm ⊓ rail

Supply characteristics

Relay type			**RM17UAS14**	**RM17UAS16** **RM17UBE16**	**RM17UAS15** **RM17UBE15**
Rated supply voltage Un		**V**	12 Vdc	24–48 Vac/Vdc	110–240 Vac/Vdc
Operating range		**V**	7–20 Vdc	15–100 Vac/Vdc	50–270 Vac/Vdc
Setting range		**V**	9–15 Vdc	20–80 Vac/Vdc	65–260 Vac/Vdc
Polarity on d.c. supply			Yes		
Frequency	Of the power supply circuit	**Hz**	50/60 Hz ± 10 %		
Galvanic isolation, supply/measurement			No		
Maximum power consumption at Un			1 W on Vdc	1.6 W on Vdc, 3.9 on Vac	1 W on Vdc, 3 on Vac
Immunity to microbreaks		**ms**	20 at 12 V	20	

Immunity to electromagnetic interference

Electromagnetic compatibility		Immunity NF EN 61000-6-2 / IEC 61000-6-2 Emission NF EN 61000-6-4 NF EN 61000-6-3 IEC 61000-6-4 IEC 61000-6-3

Input and measurement circuit characteristics

Frequency of the measured signal		**Hz**	50–60 ± 10 %
Maximum measuring cycle		**ms**	250/measurement as true rms value
Adjustable hysteresis or fixed hysteresis	**RM17UAS●●**		5–20 % of the threshold setting
	RM17UBE●●		3 % of the fixed threshold setting
Setting accuracy			10 % of the full scale value
Repeat accuracy (with constant parameters)			± 0.5 %
Measurement error with voltage variation			< 1 % over the whole range
Measurement error with temperature variation			0.2 %/ °C

Time delay characteristics

Time delay on crossing the threshold	**s**	0.1–10, 0 + 10 %
Repeat accuracy (with constant parameters)		± 1 %
Reset time	**s**	1.5
Delay on pick-up	**ms**	500 on Vac/1000 on Vdc

Output characteristics

Type of output		1 C/O contact
Contact type		Cadmium-free
Maximum switching voltage	**Vac/Vdc**	250
Rated breaking capacity	**VA**	1250
Minimum breaking current	**mA**	10/5 Vdc
Current rating—Resistive (Inductive)	**A**	5 (1 A at 24 Vdc, 5 A at 24 Vac, 3 A at 250 Vac)
Electrical durability ▲		1 x 10^5 operating cycles
Mechanical durability ▲		30 x 10^6 operating cycles
Maximum operating rate		360 operations/hour under full load
Utilization categories Conforming to IEC 60947-5-1		AC-12, AC-13, AC-14, AC-15, DC-12, DC-13, DC-14

▲ The expected life expressed above is based on average usage and normal operating conditions. Actual operating life will vary with conditions. The above statements are not intended to nor shall they create any expressed or implied warranties as to product operation or life. For information on the listed warranty offered on this product, refer to the Square D Conditions of Sale found in the Digest.

Catalog numbers

106442 
RM17UAS14

106441 
RM17UAS16

106442 
RM17UAS15

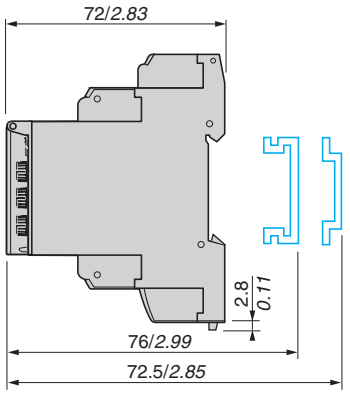
106444 
RM17UBE16

106443 
RM17UBE15

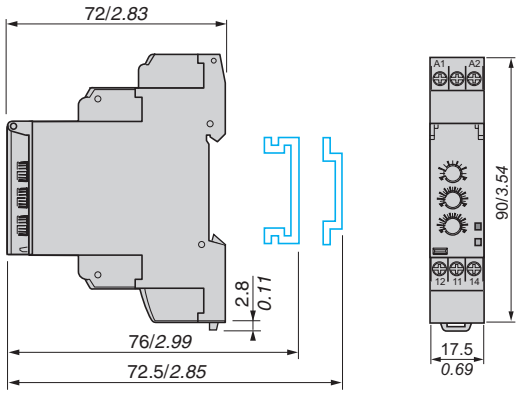
Function	Ranges controlled	Nominal voltage	Output	Catalog numbers	Weight lb(kg)
• Overvoltage or undervoltage	9–15 Vdc	12 Vdc	1 C/O 5 A	**RM17UAS14**	0.176 (0.080)
	20–80 Vac/Vdc	24–48 Vac/Vdc	1 C/O 5 A	**RM17UAS16**	0.176 (0.080)
	65–260 Vac/Vdc	110–240 Vac/Vdc	1 C/O 5 A	**RM17UAS15**	0.176 (0.080)
• Overvoltage and undervoltage in window mode	20–80 Vac/Vdc	24–48 Vac/Vdc	1 C/O 5 A	**RM17UBE16**	0.176 (0.080)
	65–260 Vac/Vdc	110–240 Vac/Vdc	1 C/O 5 A	**RM17UBE15**	0.176 (0.080)

Approximate dimensions

RM17UAS●●



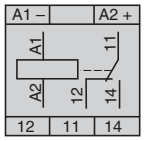
RM17UBE●●



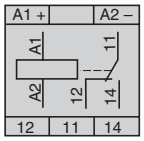
mm/*In.*

Wiring diagrams

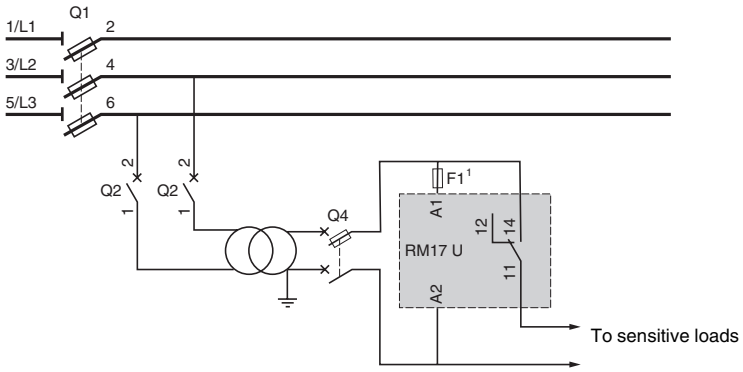
RM17UAS14



RM17UAS16, RM17UAS15, RM17UBE●●



Application scheme



[1] 1 A fast-acting fuse—UL = Class CC; IEC = gG

105678

RM35UA1●MW

Product description

Multifunction voltage control relays RM35UA1●MW monitor both a.c. and d.c. voltages.

- Automatic Vdc or Vac recognition
- Measurement ranges from 0.05 V to 600 V
- Selection between overvoltage and undervoltage
- Measurement as true rms value
- Selectable memory function

Settings are protected by a sealable cover.

Control status is indicated by an LED.

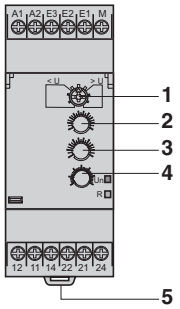
The relays are designed for clip-on mounting on ⊓ rail.

Applications

- d.c. motor overspeed control
- Battery monitoring
- Monitoring of a.c. or d.c. supplies
- Speed monitoring (with tacho-generator)

Description

RM35UA11MW, RM35UA12MW, RM35UA13MW



1 Configuration: selection of operating mode, **<U / >U**, (with or without memory)
Memory - No Memory

2 Voltage threshold setting potentiometer,
U Value

3 Hysteresis adjustment potentiometer, **H**

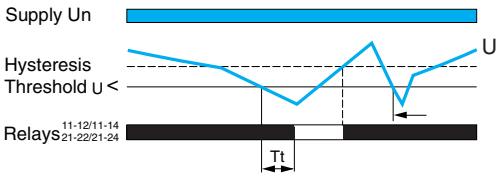
4 Time delay setting potentiometer, **Tt**

5 Spring for clip-on mounting on 35 mm ⊓ rail.

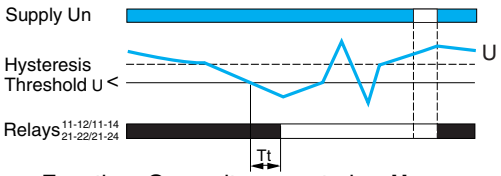
Un	Green LED: indicates that supply to the relay is on.
R	Yellow LED: indicates relay output state.

Function diagrams

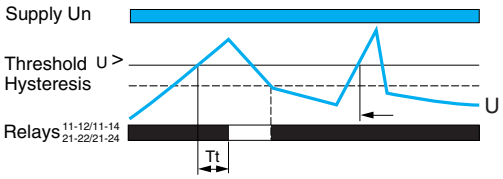
- Function: Undervoltage control, **< U**
- **Without Memory**



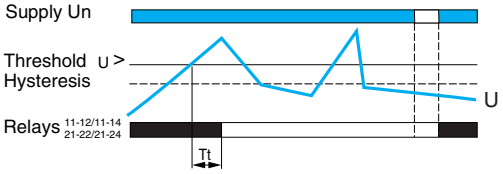
- **With Memory**



- Function: Overvoltage control, **> U**
- **Without Memory**



- **With Memory**



Tt: time delay after crossing of threshold (adjustable on front panel)

Operating principle

Control relays RM35UA1●MW are designed to monitor a.c. or d.c. voltages.

They automatically recognize the form of the Vdc or Vac (50 or 60 Hz) signal.

Fault signalling is by LED.

Overvoltage and undervoltage control relays: RM35UA11MW, RM35UA12MW and RM35UA13MW

■ **The operating mode is fixed by the user**.

A switch allows selection between the following modes:

- Undervoltage with or without memory
- Overvoltage with or without memory

The position of the switch, and therefore the operating mode, is read by the product on energization.

If the switch is set to an unacceptable position, the product detects a fault, the output relay stays open, and the LEDs flash to signal the position error.

If the switch position is changed while the device is operating, all the LEDs flash, but the product continues to operate normally with the function selected at the time of energization preceding the change of position.

The LEDs return to their normal state if the switch is returned to the original position selected prior to the last energization.

The undervoltage or overvoltage threshold value is set by means of a potentiometer graduated as a percentage of the scale value of **Un** to be monitored.

The hysteresis is adjusted by means of a potentiometer graduated from 5–50% of the threshold setting. The hysteresis value must not exceed the limit values of the measuring range.

In overvoltage mode, if the voltage controlled exceeds the threshold setting for a time greater than that set on the front panel (0.3–30 s), the output relay opens and LED **R** goes out. During the time delay, this LED flashes.

As soon as the voltage drops below the value of the threshold setting, minus the hysteresis, the relay instantly closes.

In undervoltage mode, if the voltage controlled falls below the threshold setting for a time greater than that set on the front panel (0.3–30 s), the output relay opens and LED **R** goes out. During the time delay, this LED flashes.

As soon as the voltage rises above the value of the threshold setting, plus the hysteresis, the relay instantly closes.

■ **Memory mode**:

If Memory mode is selected, the relay opens when crossing of the threshold is detected and then stays in that position.

The power must be switched off to reset the product.

Environment characteristics

Conforming to standards			NF EN 60255-6 and IEC 60255-6
Product certifications	Pending		UL (File E173076 CNN NRNT), CSA (File 217698 Guide 3211-07), GL, C-Tick, GOST
Marking			CE: 73/23/EEC and EMC 89/336/EEC, RoHS
Ambient air temperature around the device	Storage	**°F (°C)**	- 40 to 158 (- 40 to + 70)
	Operation	**°F (°C)**	- 4 to 122 (- 20 to + 50)
Permissible relative humidity	Conforming to IEC 60068-2-30		2 x 24 hours to + 95 % RH at + 131°F (55 °C) without condensation
Vibration resistance	Conforming to IEC 60068-2-6		0.035 mm from 10–150 Hz
Shock resistance	Conforming to IEC 60068-2-6		5 gn
Degree of protection	Casing		IP 30
Conforming to IEC 60529	Terminals		IP 20
Degree of pollution	Conforming to IEC 60664-1		3
Overvoltage category	Conforming to IEC 60664-1		III
Insulation resistance	Conforming to 60664-1/60255-5		> 500 MΩ, 500 Vdc
Rated insulation voltage	Conforming to IEC 60664-1	**V**	250 or greater (measured at 600 V)
Insulation test voltage	Dielectric test	**kV**	2, 50 Hz, 1 min. on Vac
Conforming to IEC 60664-1/60255-5	Shock wave	**kV**	4 (1.2/50 µs)
Wiring range Conforming to IEC 60947-1 and UL 508	Solid cable without cable end	**AWG (mm^2)**	One 14–20 (2.5–0.5) Two 16–20 (1.5–0.5)
	Flexible cable with cable end	**AWG (mm^2)**	One 14–20 (2.5–0.5) Two 16–20 (1.5–0.5)
Tightening torque	Conforming to IEC 60947-1 and UL 508		0.6–1 N.m / *5.3–8.8 lb-in*
Housing material			Self-extinguishing plastic
Power ON indicator			Green LED
Relay state indicator			Yellow LED
Mounting position without derating	In relation to normal vertical mounting plane		Any position
Mounting	Conforming to IEC/EN 60715		On 35 mm ⊓ rail

Supply characteristics

Rated supply voltage Un		**Vac/Vdc**	24–240
Operating range		**Vac/Vdc**	20.4–264
Polarity on d.c. supply			No
Voltage limits	Of the power supply circuit		- 15 %, + 10 %
Frequency	Of the power supply circuit		50/60 Hz ± 10 %
Galvanic isolation, supply/measurement			Yes
Maximum power consumption		**VA**	3.5 on Vac, 0.6 W on Vdc
Immunity to microbreaks		**ms**	10

Immunity to electromagnetic interference

Electromagnetic compatibility			Immunity NF EN 61000-6-2 / IEC 61000-6-2 Emission NF EN 61000-6-4 NF EN 61000-6-3 IEC 61000-6-4 IEC 61000-6-3

Input and measurement circuit characteristics

Relay type			**RM35UA11MW**	**RM35UA12MW**	**RM35UA13MW**
Measurement range		**V**	0.05–5	1–100	15–600
Sub-measurement range	E1-M	**V**	0.05–0.5	1–10	15–150
	E2-M	**V**	0.3–3	5–50	30–300
	E3-M	**V**	0.5–5	10–100	60–600
Input resistance	E1-M	**kΩ**	5	22	150
	E2-M	**kΩ**	30	110	300
	E3-M	**kΩ**	50	220	600
Frequency of the measured signal		**Hz**	40–70 ± 10 %		
Maximum measuring cycle		**ms**	30/measurement as true rms value		
Threshold setting			10–100 % of the range		
Adjustable hysteresis or fixed hysteresis			5–50 % of the threshold setting		
Setting accuracy			10 % of the full scale value		
Repeat accuracy (with constant parameters)			± 0.5 %		
Measurement error with voltage variation			< 1 % / V over the whole range		
Measurement error with temperature variation			± 0.05 % / °C		

Time delay characteristics		
Time delay on crossing the threshold Tt	**s**	0.3–30, 0 + 10 %
Repeat accuracy (with constant parameters)		± 2 %
Reset time	**s**	1.5
Delay on pick-up	**ms**	600
Output characteristics		
Type of output		2 C/O contacts
Contact type		Cadmium-free
Maximum switching voltage	**Vac/Vdc**	250
Rated breaking capacity	**VA**	1250
Minimum breaking current	**mA**	10/5 Vdc
Current rating—Resistive (Inductive)	**A**	5 (1 A at 24 Vdc, 5 A at 24 Vac, 3 A at 250 Vac)
Electrical durability ▲		1 x 10^5 operating cycles
Mechanical durability ▲		30 x 10^6 operating cycles
Maximum operating rate		360 operations/hour under full load
Utilization categories Conforming to IEC 60947-5-1		AC-12, AC-13, AC-14, AC-15, DC-12, DC-13, DC-14

▲ The expected life expressed above is based on average usage and normal operating conditions. Actual operating life will vary with conditions. The above statements are not intended to nor shall they create any expressed or implied warranties as to product operation or life. For information on the listed warranty offered on this product, refer to the Square D Conditions of Sale found in the Digest.

Catalog numbers

105678

RM35UA11MW

105679

RM35UA12MW

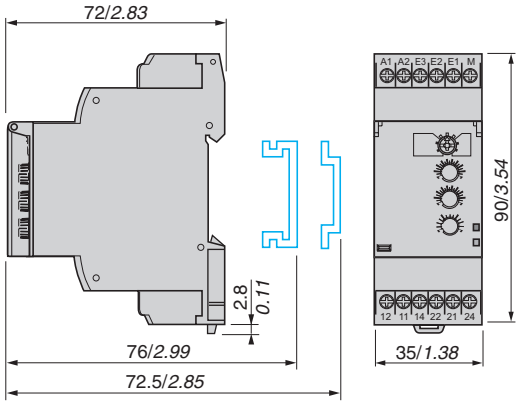
105680

RM35UA13MW

Function	Range controlled V	Supply voltage Vac/Vdc	Output	Catalog numbers	Weight lb(kg)
• Over-voltage or undervoltage	0.05–5	24–240	2 C/O 5 A	**RM35UA11MW**	0.286 (0.130)
	1–100	24–240	2 C/O 5 A	**RM35UA12MW**	0.286 (0.130)
	15–600	24–240	2 C/O 5 A	**RM35UA13MW**	0.286 (0.130)

Approximate dimensions

RM35UA1●MW



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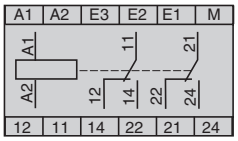
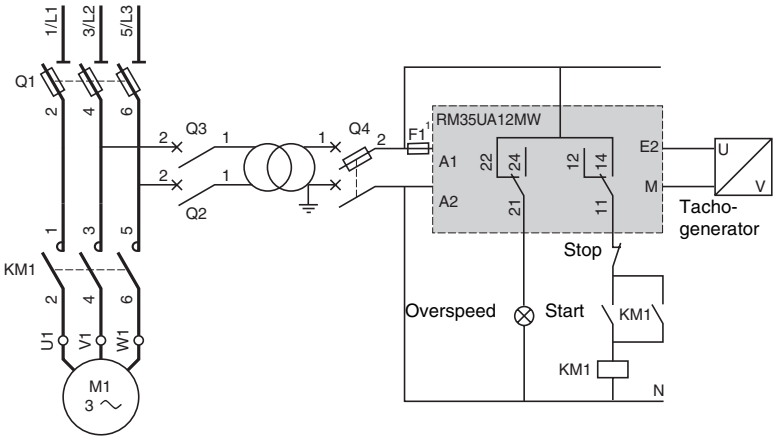
Wiring diagram

RM35UA1●MW



Wiring diagram

Example: overspeed monitoring (undervoltage function)



[1] 1 A fast-acting fuse—UL = Class CC; IEC = gG

106445

RM17JC00MW

Product description

The control relay RM17JC00MW is designed to monitor a.c. currents.

- Integrated current transformer
- Measurement range 2–20 A
- Choice of action on the output relay

Control status is indicated by an LED.

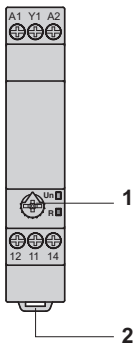
The relay is designed for clip-on mounting on ⊓ rail.

Applications

- Monitoring of load state of motors and generators
- Monitoring of current drawn by a 3-phase motor
- Monitoring of heating or lighting circuits
- Monitoring of pump draining (undercurrent)
- Monitoring of overtorque (crushers)
- Monitoring of electromagnetic brakes or clutches

Description

RM17JC00MW



1 Overcurrent setting potentiometer

2 Spring for clip-on mounting on 35 mm ⊓ rail

Un	Green LED: indicates that supply to the relay is on.
R	Yellow LED: indicates relay output state.

Operating principle

- Control relay RM17JC00MW is designed to monitor overcurrent.
- It is equipped with an integrated current transformer.
- Fault signalling is by LED.

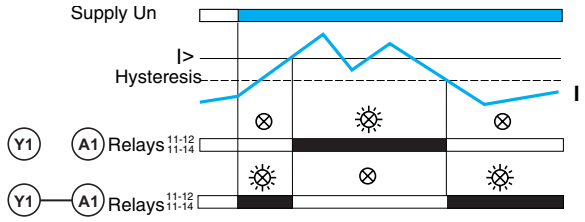
Current control relay

Relay RM17JC00MW controls overcurrent.

The relay closes when the current exceeds the threshold setting on the front panel and opens when it drops below the threshold minus the hysteresis.

When terminal Y1 is linked to A1 (+), the output is reversed. The relay opens when the current exceeds the threshold setting on the front panel and closes again when it drops below the hystereris value.

Function diagram



Environment characteristics			
Conforming to standards			NF EN 60255-6 and IEC 60255-6
Product certifications	Pending		UL (File E173076 CNN NRNT), CSA (File 217698 Guide 3211-07), GL, C-Tick, GOST
Marking			CE: 73/23/EEC and EMC 89/336/EEC, RoHS
Ambient air temperature around the device	Storage	**°F (°C)**	- 40 to 158 (- 40 to + 70)
	Operation	**°F (°C)**	- 4 to 122 (- 20 to + 50)
Permissible relative humidity	Conforming to IEC 60068-2-30		2 x 24 hours to + 95 % RH at + 131°F (55 °C) without condensation
Vibration resistance	Conforming to IEC 60068-2-6		0.035 mm from 10–150 Hz
Shock resistance	Conforming to IEC 60068-2-6		5 gn
Degree of protection	Casing		IP 30
Conforming to IEC 60529	Terminals		IP 20
Degree of pollution	Conforming to IEC 60664-1		3
Overvoltage category	Conforming to IEC 60664-1		III
Insulation resistance	Conforming to 60664-1/60255-5		> 500 MΩ, 500 Vdc
Rated insulation voltage	Conforming to IEC 60664-1	**V**	400
Insulation test voltage	Dielectric test	**kV**	2, 50 Hz, 1 min. on Vac
	Shock wave	**kV**	4
Mounting position without derating	In relation to normal vertical mounting plane		Any position
Wiring range Conforming to IEC3 60947-1 and UL 508	Solid cable without cable end	**AWG (mm^2)**	One 14–20 (2.5–0.5) Two 16–20 (1.5–0.5)
	Flexible cable with cable end	**AWG (mm^2)**	One 14–20 (2.5–0.5) Two 16–20 (1.5–0.5)
Tightening torque	Conforming to IEC 60947-1 and UL 508		0.6–1 N.m / *5.3–8.8 lb-in*
Housing material			Self-extinguishing plastic
Power ON indicator			Green LED
Relay state indicator			Yellow LED
Mounting	Conforming to IEC/EN 60715		On 35 mm ⊓ rail
Supply characteristics			
Rated supply voltage Un		**Vac/Vdc**	24–240
Operating range		**Vac/Vdc**	20.4–264
Polarity on d.c. supply			Yes
Voltage limits	Of the power supply circuit		- 15 %, + 10 %
Frequency	Of the power supply circuit	**Hz**	50/60 Hz ± 10 %
Galvanic isolation, supply/measurement			Yes
Maximum power consumption		**VA**	3 VA, 1 W
Immunity to microbreaks		**ms**	10
Immunity to electromagnetic interference			
Electromagnetic compatibility			Immunity NF EN 61000-6-2 / IEC 61000-6-2 Emission NF EN 61000-6-4, NF EN 61000-6-3, IEC 61000-6-4, IEC 61000-6-3
Input and measurement circuit characteristics			
Measurement range		**A**	2–20
Continuous overload at 77 °F (25 °C)		**A**	100
Non repetitive overload < 3 s at 77 °F (25 °C)		**A**	300
Frequency of the measured signal		**Hz**	40–70 sinusoidal
Maximum measuring cycle		**ms**	30, measured as true rms value
Adjustment of current threshold		**%**	10–100 % of the range
Fixed hysteresis		**%**	15 % of the threshold setting, fixed
Setting accuracy			± 10 % of the full scale value
Repeat accuracy (with constant parameters)			± 0.5 %
Measurement error with voltage variation			< 1 % / V over the whole range
Measurement error with temperature variation			± 0.05 % / °C
Time delay characteristics			
Time delay in the event of a fault		**ms**	< 200
Delay on pick-up		**ms**	500

Output characteristics

Output type		1 C/O contact
Contact type		Cadmium-free
Current rating—Resistive (Inductive)	**A**	5 (1 A at 24 Vdc, 5 A at 24 Vac, 3 A at 250 Vac)
Maximum switching voltage	**Vac/Vdc**	250
Rated breaking capacity	**VA**	1250
Minimum breaking current	**mA**	10 / 5 Vdc
Electrical durability ▲		1 x 10^5 operating cycles
Mechanical durability ▲		30 x 10^6 operating cycles
Maximum operating rate		360 operations/hour under full load
Utilization categories Conforming to IEC 60947-5-1		AC-12, AC-13, AC-14, AC-15, DC-12, DC-13, DC-14

▲ The expected life expressed above is based on average usage and normal operating conditions. Actual operating life will vary with conditions. The above statements are not intended to nor shall they create any expressed or implied warranties as to product operation or life. For information on the listed warranty offered on this product, refer to the Square D Conditions of Sale found in the Digest.

Catalog number

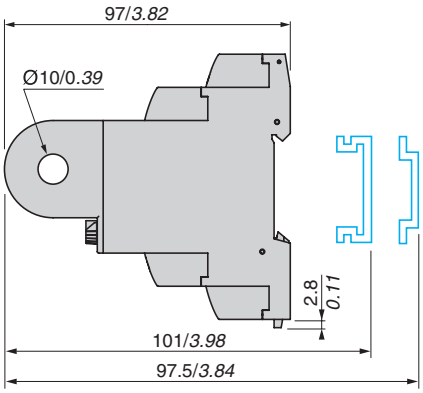
106445

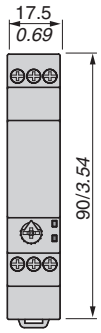
RM17JC00MW

Function	Supply Vac/Vdc	Measurement range A	Output	Catalog number	Weight lb(kg)
• Overcurrent	24–240	2–20	1 C/O 5 A	**RM17JC00MW**	0.242 (0.110)

Approximate dimensions

RM17JC00MW

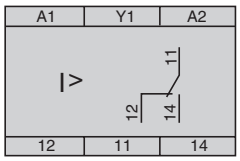




mm/*In.*

Wiring diagram

RM17JC00MW



Product description

RM35JA3●MW

Product description

Multifunction current control relays RM35JA3●MW monitor both a.c. and d.c. currents.

- Automatic d.c. or a.c. recognition
- Measurement ranges from 2 mA to 15 A
- Selection between overcurrent and undercurrent
- Measurement as true rms value
- Selectable memory function

Settings are protected by a sealable cover.

Control status is indicated by an LED.

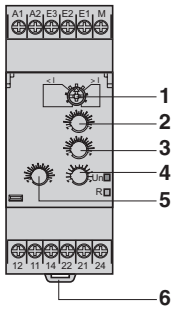
The relays are designed for clip-on mounting on ⊓ rail.

Applications

- Excitation control of d.c. machines
- Control of load state of motors and generators
- Control of current drawn by a 3-phase motor
- Monitoring of heating or lighting circuits
- Control of pump draining (undercurrent)
- Control of overtorque (crushers)
- Monitoring of electromagnetic brakes or clutches

Description

RM35JA31MW, RM35JA32MW



1 Configuration: selection of operating mode, **<I / >I**, (with or without memory)
Memory - No Memory

2 Current threshold setting potentiometer, **I %**

3 Hysteresis adjustment potentiometer, **Hysteresis**

4 Time delay adjustment potentiometer, **Tt**

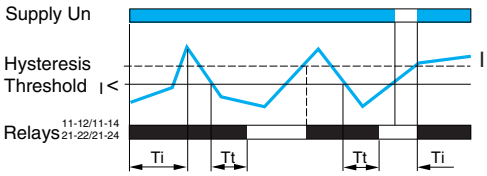
5 Starting time delay adjustment potentiometer, **Ti**

6 Spring for clip-on mounting on 35 mm ⊓ rail

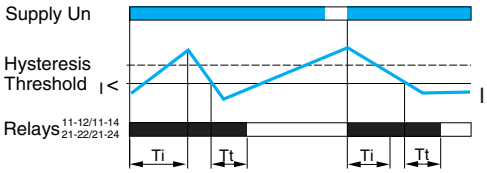
Un	Green LED: indicates that supply to the relay is on.
R	Yellow LED: indicates relay output state.

Function diagrams

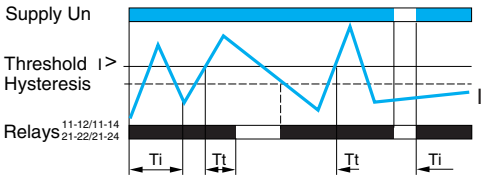
- Function: Undercurrent detection, **< I**
- **Without Memory**



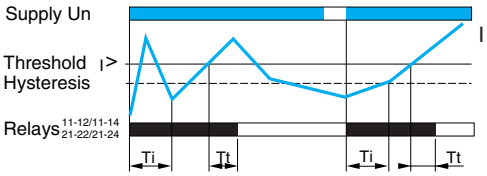
- **With Memory**



- Function: Overcurrent detection, **> I**
- **Without Memory**



- **With Memory**



Ti: starting inhibit time
(adjustable on front panel)

Tt: time delay after crossing of threshold
(adjustable on front panel)

Operating principle

Control relays RM35JA3●MW are designed to monitor a.c. or d.c. currents.

They automatically recognize the form of the d.c. or a.c. (50 or 60 Hz) signal and can provide direct monitoring up to 15 A. Above this value, a current transformer can be connected.

Fault signalling is by LED.

a.c. or d.c. current control relays: RM35JA31MW and JA32MW

The operating mode is fixed by the user.

A switch allows selection between the following modes:

- Undercurrent, with or without memory
- Overcurrent, with or without memory

The position of the switch, and therefore the operating mode, is read by the product on energization.

If the switch is set to an unacceptable position, the product detects a fault, the output relay stays open, and the LEDs flash to signal the position error.

If the switch position is changed while the device is operating, all the LEDs flash, but the product continues to operate normally with the function selected at the time of energization preceding the change of position.

The LEDs return to their normal state if the switch is returned to the original position selected prior to the last energization.

The undercurrent or overcurrent threshold value is set by means of a potentiometer graduated as a percentage of the scale value of **I** to be monitored.

The hysteresis is adjusted by means of a potentiometer graduated from 5–50% of the threshold setting. The hysteresis value must not exceed the limit values of the measuring range.

In overcurrent (undercurrent) mode, if the current exceeds (falls below) the threshold setting for a time greater than that set on the front panel (0.3–30 s), the relays open and the LED goes out.

As soon as the current returns to below (above) the threshold minus (plus) hysteresis, the relay instantly closes again.

Memory mode:

If Memory mode is selected, the relay opens when crossing of the threshold is detected and then stays in that position.

The power must be switched off to reset the product.

On energization, an inhibit time delay (1–20 s) makes it possible to inhibit current peaks (or troughs) on start-up of equipment.

Environment characteristics			
Conforming to standards			NF EN 60255-6 and IEC 60255-6
Product certifications	Pending		UL (File E173076 CNN NRNT), CSA (File 217698 Guide 3211-07), GL, C-Tick, GOST
Marking			CE: 73/23/EEC and EMC 89/336/EEC, RoHS
Ambient air temperature around the device	Storage	**°F (°C)**	- 40 to 158 (- 40 to + 70)
	Operation	**°F (°C)**	- 4 to 122 (- 20 to + 50)
Permissible relative humidity	Conforming to IEC 60068-2-30		2 x 24 hours to + 95 % RH at + 131°F (55 °C) without condensation
Vibration resistance	Conforming to IEC 60068-2-6		0.035 mm from 10–150 Hz
Shock resistance	Conforming to IEC 60068-2-6		5 gn
Degree of protection Conforming to IEC 60529	Casing		IP 30
	Terminals		IP 20
Degree of pollution	Conforming to IEC 60664-1		3
Overvoltage category	Conforming to IEC 60664-1		III
Insulation resistance	Conforming to 60664-1/60255-5		> 500 MΩ, 500 Vdc
Rated insulation voltage	Conforming to IEC 60664-1	**V**	250
Insulation test voltage	Dielectric test	**kV**	2, 50 Hz, 1 min. on Vac
To IEC 60664-1/60255-5	Shock wave	**kV**	4 (1.2/50 µs)
Wiring range Conforming to IEC3 60947-1 and UL 508	Solid cable without cable end	**AWG (mm^2)**	One 14–20 (2.5–0.5) Two 16–20 (1.5–0.5)
	Flexible cable with cable end	**AWG (mm^2)**	One 14–20 (2.5–0.5) Two 16–20 (1.5–0.5)
Tightening torque	Conforming to IEC 60947-1 and UL 508		0.6–1 N.m / *5.3–8.8 lb-in*
Housing material			Self-extinguishing plastic
Power ON indicator			Green LED
Relay state indicator			Yellow LED
Mounting position without derating	In relation to normal vertical mounting plane		Any position
Mounting	Conforming to IEC/EN 60715		On 35 mm ⊓ rail
Supply characteristics			
Rated supply voltage Un		**Vac/Vdc**	24–240
Operating range		**Vac/Vdc**	20.4–264
Polarity on d.c. supply			No
Voltage limits	Of the power supply circuit		- 15 %, + 10 %
Frequency	Of the power supply circuit		50/60 Hz ± 10 %
Galvanic isolation, supply/measurement			Yes
Maximum power consumption		**VA**	3.5 on Vac, 0.6 Wdc
Immunity to microbreaks		**ms**	50
Immunity to electromagnetic interference			
Electromagnetic compatibility			Immunity NF EN 61000-6-2 / IEC 61000-6-2 Emission NF EN 61000-6-4, NF EN 61000-6-3, IEC 61000-6-4, IEC 61000-6-3

Measurement circuit and input characteristics				
Relay type			**RM35JA31MW**	**RM35JA32MW**
Measurement range			2–500 mA	0.15–15 A
Sub-measurement range	E1-M		2–20 mA	0.15–1.5 A
	E2-M		10–100 mA	0.5–5 A
	E3-M		50–500 mA	1.5–15 A
Input resistance	E1-M	Ω	5	0.05
	E2-M	Ω	1	0.015
	E3-M	Ω	0.2	0.005
Frequency of the measured signal		**Hz**	40–70 ± 10 %	
Maximum measuring cycle		**ms**	30/measurement as true rms value	
Threshold setting			10–100 % of the range	
Adjustable hysteresis			5–50 % of the threshold setting	
Setting accuracy			± 10 % of the full scale value	
Repeat accuracy (with constant parameters)			± 0.5 %	
Measurement error with voltage variation			1 % / V over the whole range	
Measurement error with temperature variation			0.05 % / °C	
Time delay characteristics				
Time delay on energization Ti		**s**	1–20, 0 + 10 %	
Time delay on crossing the threshold Tt		**s**	0.3–30, 0 + 10 %	
Repeat accuracy (with constant parameters)			± 2 %	
Reset time		**s**	1.5	
Delay on pick-up		**ms**	300	

Output characteristics

Type of output			2 C/O contacts
Contact type			Cadmium-free
Maximum switching voltage		**Vac/Vdc**	250
Rated breaking capacity		**VA**	1250
Minimum breaking current		**mA**	10/5 Vdc
Current rating—Resistive (Inductive)		**A**	5 (1 A at 24 Vdc, 5 A at 24 Vac, 3 A at 250 Vac)
Electrical durability ▲			1 x 10^5 operating cycles
Mechanical durability ▲			30 x 10^6 operating cycles
Maximum operating rate			360 operations/hour under full load
Utilization categories	Conforming to IEC 60947-5-1		AC-12, AC-13, AC-14, AC-15, DC-12, DC-13, DC-14

▲ The expected life expressed above is based on average usage and normal operating conditions. Actual operating life will vary with conditions. The above statements are not intended to nor shall they create any expressed or implied warranties as to product operation or life. For information on the listed warranty offered on this product, refer to the Square D Conditions of Sale found in the Digest.

Catalog numbers

105682

RM35JA31MW

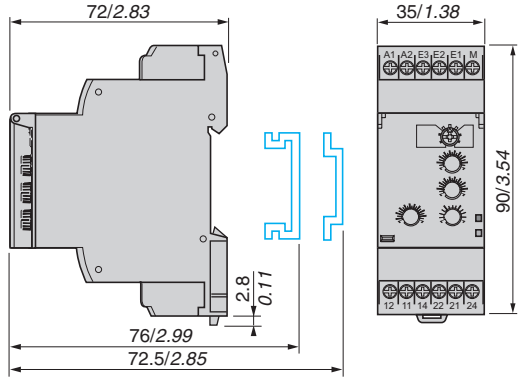
105683

RM35JA32MW

	Function	Range controlled	Supply Vac/Vdc	Output	Catalog numbers	Weight lb(kg)
•	Overcurrent or undercurrent.	2 –500 mA	24–240	2 C/O 5 A	**RM35JA31MW**	0.286 (0.130)
		0.15–15 A	24–240	2 C/O 5 A	**RM35JA32MW**	0.286 (0.130)

Approximate dimensions

RM35JA3●MW



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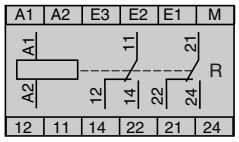
Wiring diagram

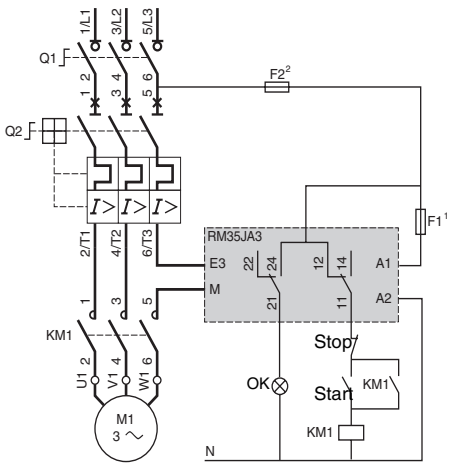
RM35JA3●MW



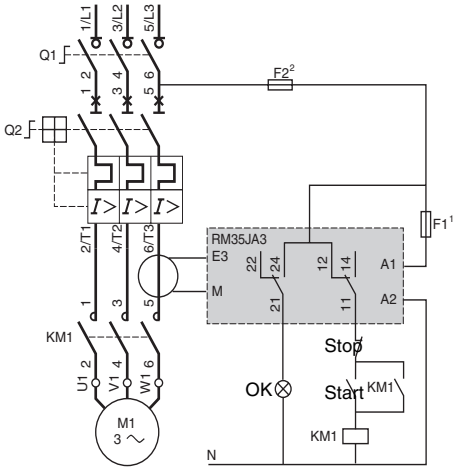
Wiring diagrams

Example: detection of jamming on a crusher (overcurrent function)

Current measured ⩽ 15 A



Current measured > 15 A



[1] 1 A fast-acting fuse—UL = Class CC; IEC = gG
[2] Fuse size is dependent on the size of the load being switched.

105685

RM35L●●●MW

Product description

Level control relays RM35LM33MW and RM35LV14MW control one or two levels, with fill or empty function:

- RM35LM33MW: control by resistive level probe
- RM35LV14MW: control by discrete sensor

Settings are protected by a sealable cover.

Control status is indicated by an LED.

The relays are designed for clip-on mounting on ⊓ rail.

Applications

These devices monitor the levels of conductive liquid or non-conductive material. They control the actuation of pumps or valves to regulate levels. They are also suitable for protecting submersible pumps against dry running, or protecting tanks from overflow. They can also be used to control dosing of liquids in mixing processes, and to protect heating elements in the event of non immersion.

They have a transparent, hinged cover on their front panel to prevent accidental alteration of the settings. This cover can be directly sealed.

■ **Application examples for RM35LM33MW:**

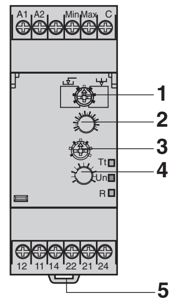
- spring, town, industrial and sea water
- metallic salt, acid or base solutions
- liquid fertilizers
- non concentrated alcohol (< 40%)
- liquids in the food-processing industry: milk, beer, coffee, etc.

■ **Application examples for RM35LV14MW:**

- chemically pure water
- fuels, liquid gasses (inflammable)
- oil, concentrated alcohol (> 40%)
- ethylene, glycol, paraffin, varnish and paints

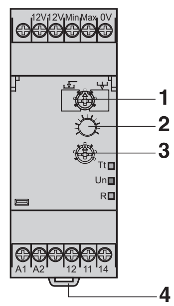
Description

RM35LM33MW



1 Configuration: selection of operating mode: / and of sensitivity range, **LS, St, HS**.
2 Sensitivity adjustment potentiometer, **%**
3 Switch for selecting the number of levels
4 Time delay adjustment potentiometer,**Tt**
5 Spring for clip-on mounting on 35 mm rail

RM35LV14MW



1 Configuration: selection of operating mode: / and of sensor type PNP, NPN
2 Time delay adjustment potentiometer, **Tt**
3 Switch for selecting the number of levels
4 Spring for clip-on mounting on 35 mm rail

Tt	Yellow LED: indicates timing status.
Un	Green LED: indicates that supply to the relay is on.
R	Yellow LED: indicates relay output state.
LS	Low sensitivity: 250 Ω–5 KΩ
St	Standard sensitivity: 5 KΩ–100 KΩ
HS	High sensitivity: 50 KΩ–1 MΩ

NOTE: = Filling Tank
= Empty Tank

Operating principle

Control relays RM35LM and RM35LV are designed to control levels of:

- Conductive liquid for RM35LM
- Any other material for RM35LV

Relay RM35LM measures the levels by means of resistive probes.
Relay RM35LM controls the levels of conductive liquids.

The operating principle is based on measurement of the apparent resistance of the liquid between two submerged probes. When this value is less than the threshold setting on the front panel of the device, the relay changes state. To avoid electrolytic phenomena, an a.c. current runs across the probes. A selector switch on the front panel allows selection of the required function and sensitivity range. Control of one single level can be achieved by using the 2nd selector switch.

In this case, the Max level probe stays up in the air and an adjustable time delay avoids any wave effect.

Relay RM35LV measures the levels by means of discrete sensors.
These two products activate their output relay when a tank is either emptying or filling.

A green LED indicates that the supply is ON.
A yellow LED indicates the state of the output relay.
A yellow LED indicates that timing is in progress.
The green and yellow LEDs flash to indicate an unacceptable setting position.

Level control relay: RM35LM33MW

Configuration

A selector switch on the front panel allows selection of the required sensitivity range and of the empty or fill function.

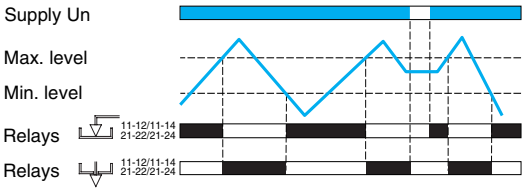
A second switch allows selection of the number of levels (1 or 2) and the type of time delay in the case of 1 level mode.

The configuration of these switches is taken into account on energization. If the switch is set to an unacceptable position, the product detects a fault, the output relay stays open, and the LEDs flash to signal the position error. If the switch position is changed while the device is operating, all the LEDs flash, but the product continues to operate normally with the function selected at the time of energization preceding the change of position. The LEDs return to their normal state if the switch is returned to the original position selected prior to the last energization.

Operating principle

Function diagram

- Fill/Empty function



Level control relay: RM35LM33MW *(continued)*

Configuration *(continued)*

■ **Control of two levels**

- Empty function

Level: 2, function:

— **LS** (Low Sensitivity: 250 Ω–5 kΩ)
— **St** (Standard Sensitivity: 5 kΩ–100 kΩ)
— **HS** (High Sensitivity: 50 kΩ–1 MΩ)

The output relay stays open until the liquid reaches the Max. level probe. As soon as the Max. level is reached, the contact closes and then allows emptying of the tank (the valve opens and the pump starts). When the level drops below the Min. level, the contact opens to stop the emptying process.

NOTE: When two levels are controlled, the anti-wave time delay function is not active.

- Fill function

Level: 2, function:

— **LS** (Low Sensitivity: 250 Ω–5 kΩ)
— **St** (Standard Sensitivity: 5 kΩ–100 kΩ)
— **HS** (High Sensitivity: 50 kΩ–1 MΩ)

The output relay stays energized until the liquid reaches the Max. level probe. As soon as the Max. level is reached, the contact opens and the pump stops. When the level drops below the Min. level, the contact closes again and pumping re-starts to raise the level.

NOTE: When two levels are controlled, the anti-wave time delay function is not active.

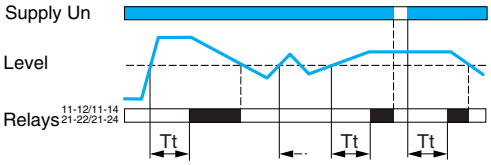
NOTE: = Filling Tank
= Empty Tank

Level control relay: RM35LM33MW *(continued)*

Configuration *(continued)*

Function diagrams

- Empty function T on



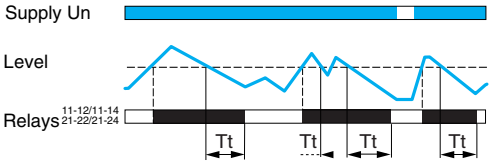
■ **Control of one level, empty function**

- level: 1 - **on delay** functions:
  - — **LS** (Low Sensitivity: 250 Ω–5 kΩ)
  - — **St** (Standard Sensitivity: 5 kΩ–100 kΩ)
  - — **HS** (High Sensitivity: 50 kΩ–1 MΩ)

When the liquid level rises above the probe for a time greater than the time delay value **Tt** set on the front panel, the relay is energized and stays energized until the liquid level drops back down to the probe.

If the liquid drops back down to below the set level before the end of the time delay, the relay does not energize.

- Empty function T off



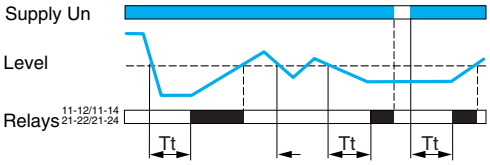
- level: 1 **- off delay** functions**:**
  - — **LS** (Low Sensitivity: 250 Ω–5 kΩ)
  - — **St** (Standard Sensitivity: 5 kΩ–100 kΩ)
  - — **HS** (High Sensitivity: 50 kΩ–1 MΩ)

When the liquid level rises above the probe, the relay instantly energizes and stays energized until the liquid again reaches the probe level for a time **Tt** set on the front panel.

If the liquid drops back down to below the set level before the end of the time delay period, the relay stays energized.

■ **Control of one level, fill function**

- Fill function T on

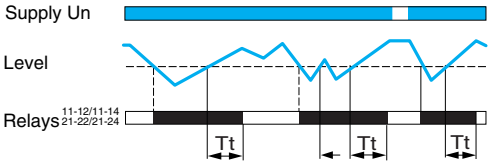


- level: 1 - **on delay** functions:
  - — **LS** (Low Sensitivity: 250 Ω–5 kΩ)
  - — **St** (Standard Sensitivity: 5 kΩ–100 kΩ)
  - — **HS** (High Sensitivity: 50 kΩ–1 MΩ)

When the liquid level drops below the probe for a time greater than the time delay value **Tt** set on the front panel, the relay is energized and stays energized until the liquid level rises back up to the probe.

If the liquid rises back up to above the set level before the end of the time delay period, the relay does not energize.

- Fill function T off



- level: 1 - **off delay** functions:
  - — **LS** (Low Sensitivity: 250 Ω–5 kΩ)
  - — **St** (Standard Sensitivity: 5 kΩ–100 kΩ)
  - — **HS** (High Sensitivity: 50 kΩ–1 MΩ)

When the liquid level drops below the probe, the relay instantly energizes and stays energized until the liquid level again reaches the probe level and stays above it for a time greater than the time delay period **Tt** set on the front panel.

If the liquid drops back down to below the set level before the end of the time delay period, the relay stays energized.

Level control relay: RM35LV14MW

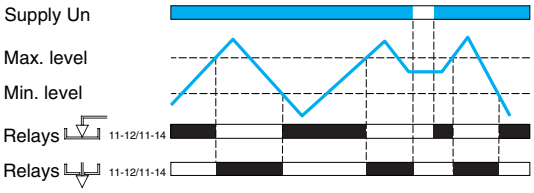
Configuration

A selector switch on the front panel allows selection of the function (empty or fill) and the type of sensor.
A second switch allows selection of the number of levels (1 or 2) and the type of time delay in the case of 1 level mode.

The configuration of these switches is taken into account on energization. If the switch is set to an unacceptable position, the product detects a fault, the output relay stays open, and the LEDs flash to signal the position error. If the switch position is changed while the device is operating, all the LEDs flash, but the product continues to operate normally with the function selected at the time of energization preceding the change of position. The LEDs return to their normal state if the switch is returned to the original position selected prior to the last energization.

Function diagram

- Fill/Empty function



■ **Control of two levels**

- Empty function. Level: 2

The output relay stays open until the material level reaches the Max. probe. As soon as the Max. level is reached, the contact closes and then allows emptying of the tank (the valve opens and the pump starts). When the level drops below the Min. probe, the contact opens to stop the emptying process.

- Fill function. Level: 2

The output relay stays energized until the material level reaches the Max. probe. As soon as the Max. level is reached, the contact opens and the pump stops. When the level drops below the Min. probe, the contact closes again and pumping re-starts to raise the level.

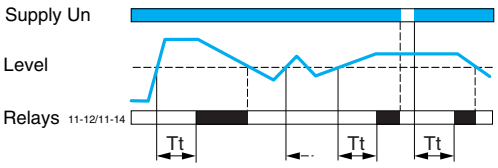
NOTE: When two levels are controlled, the anti-wave time delay function is not active.

Level control relay: RM35LV14MW *(continued)*

Configuration *(continued)*

Function diagrams

- Empty function T on



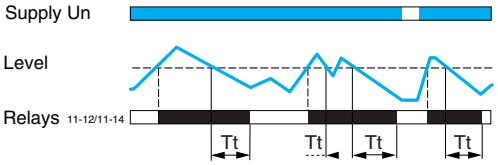
■ **Control of one level, empty function**

- Level: 1 - **on delay**

When the material level rises above the probe for a time greater than the time delay value **Tt** set on the front panel, the relay is energized and stays energized until the material level drops back down to the probe.

If the level rises above the probe before the end of the time delay period, the relay does not energize.

- Empty function T off

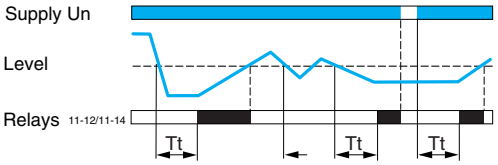


- Level: 1 - **off delay**

When the material level rises above the probe, the relay instantly energizes and stays energized until the material level again reaches the probe and stays below it for a time greater than the time delay value **Tt** set on the front panel.

If the level drops back down to below the probe before the end of the time delay period, the relay stays energized.

- Fill function T on

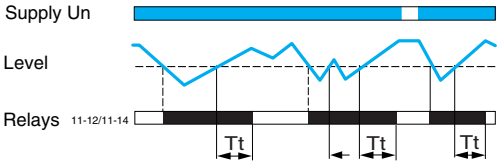


■ **Control of one level, fill function**

- Level: 1 - **on delay**

When the material level drops below the probe for a time greater than the time delay value **Tt** set on the front panel, the relay is energized and stays energized until the material level again reaches the probe.
If the level rises above the probe before the end of the time delay period, the relay does not energize.

- Fill function T off



- Level: 1 - **off delay**

When the material level drops below the probe, the relay instantly energizes and stays energized until the material level again reaches the probe and stays above it for a time greater than the time delay period Tt set on the front panel.

If the level drops back down to below the probe before the end of the time delay period, the relay stays energized.

Environment characteristics			
Conforming to standards			NF EN 60255-6 and IEC 60255-6
Product certifications	Pending		UL (File E173076 CNN NRNT), CSA (File 217698 Guide 3211-07), GL, C-Tick, GOST
Marking			CE: 73/23/EEC and EMC 89/336/EEC, RoHS
Ambient air temperature around the device	Storage	**°F (°C)**	- 40 to 158 (- 40 to + 70)
	Operation	**°F (°C)**	- 4 to 122 (- 20 to + 50)
Permissible relative humidity	Conforming to IEC 60068-2-30		2 x 24 hours to + 95 % RH at + 131°F (55 °C) without condensation
Vibration resistance	Conforming to IEC 60068-2-6		0.035 mm from 10–150 Hz
Shock resistance	Conforming to IEC 60068-2-6		5 gn
Degree of protection Conforming to IEC 60529	Casing		IP 30
	Terminals		IP 20
Degree of pollution	Conforming to IEC 60664-1		3
Overvoltage category	Conforming to IEC 60664-1		III
Insulation resistance	Conforming to 60664-1/60255-5		> 500 MΩ, 500 Vdc
Rated insulation voltage	Conforming to IEC 60664-1	**V**	250
Insulation test voltage Conforming to IEC 60664-1/60255-5	Dielectric test	**kV**	2, 50 Hz, 1 min. on Vac
	Shock wave	**kV**	4 (1.2/50 µs)
Wiring range Conforming to IEC3 60947-1 and UL 508	Solid cable without cable end	**AWG (mm^2)**	One 14–20 (2.5–0.5) Two 16–20 (1.5–0.5)
	Flexible cable with cable end	**AWG (mm^2)**	One 14–20 (2.5–0.5) Two 16–20 (1.5–0.5)
Tightening torque	Conforming to IEC 60947-1 and UL 508		0.6–1N.m / *5.3–8.8 lb-in*
Housing material			Self-extinguishing plastic
Power ON indicator			Green LED
Relay state indicator			Yellow LED
Timing indicator			Yellow LED
Mounting position without derating	In relation to normal vertical mounting plane		Any position
Mounting	Conforming to IEC/EN 60715		On ⊓ rail

Supply characteristics			
Supply voltage Un		**Vac/Vdc**	24–240
Operating range		**Vac/Vdc**	20.4–264
Voltage limits	Of the power supply circuit		- 15 %, + 10 %
Frequency	Of the power supply circuit		50/60 Hz ± 10 %
Galvanic isolation, supply/measurement			Yes
Maximum power consumption at Un		**VA**	5 on Vac
		W	1.5 Vdc
Immunity to microbreaks		**ms**	90 on Vac , 100 on Vdc

Immunity to electromagnetic interference		
Electromagnetic compatibility		Immunity NF EN 61000-6-2 2002 / IEC 61000-6-2 Emission NF EN 61000-6-4 NF EN 61000-6-3 IEC 61000-6-4 IEC 61000-6-3

Measurement circuit and input characteristics				
Relay type			**RM35LM33MW**	**RM35LV14MW**
Measurement range			250 Ω–1 MΩ	–
Sub-measurement range	LS		250 Ω–5 kΩ	–
	St		5 kΩ–100 kΩ	–
	HS		50 kΩ–1 MΩ	–
Sensitivity adjustment			5–100 % of the range	–
Setting accuracy			± 10 % of the full scale / ± 20 % for the HS range	
Measurement error with temperature variation			0.5 % / °C	
Maximum voltage at the probe terminals		**V**	12	
Maximum current across the probes		**mA**	< 1	40
Maximum probe cable length		**m**	100	100
Maximum capacity of probe cable		**nF**	1 for LS, 2.2 for St and 4.7 pour HS	10
Delay on pick-up		**ms**	600	500

Time delay characteristics

		RM35LM33MW	RM35LV14MW
Time delay on crossing the threshold	**s**	0.1–5, 0 + 10 %	
Repeat accuracy (with constant parameters)		± 2 %	
Reset time	**s**	1.75	4 if 1 line broken / 1 if 2 lines broken

Output characteristics

Type of output		2 C/O contacts	1 C/O contact
Contact type		Cadmium-free	
Current rating—Resistive (Inductive)	**A**	5 (1 A at 24 Vdc, 5 A at 24 Vac, 3 A at 250 Vac)	
Maximum switching voltage	**Vac/Vdc**	250	
Rated breaking capacity	**VA**	1250	
Minimum breaking current	**mA**	10/5 Vdc	
Maximum breaking current	**A**	5	
Electrical durability ▲		1 x 10^5 operating cycles	
Mechanical durability ▲		30 x 10^6 operating cycles	
Maximum operating rate		360 operations/hour under full load	
Utilization categories Conforming to IEC 60947-5-1		AC-12, AC-13, AC-14, AC-15, DC-12, DC-13	

▲ The expected life expressed above is based on average usage and normal operating conditions. Actual operating life will vary with conditions. The above statements are not intended to nor shall they create any expressed or implied warranties as to product operation or life. For information on the listed warranty offered on this product, refer to the Square D Conditions of Sale found in the Digest.

Catalog numbers

105685

RM35LM33MW

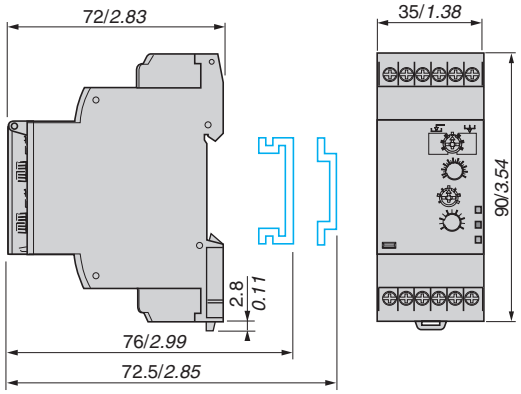
105686

RM35LV14MW

Function	Supply voltage Vac/Vdc	Output	Catalog numbers	Weight lb(kg)
Detection by resistive probes (see page 67)	4–240	2 C/O 5 A	**RM35LM33MW**	0.286 (0.130)
Detection by discrete sensors	24–240	1 C/O 5 A	**RM35LV14MW**	0.286 (0.130)

Approximate dimensions

RM35LM33MW, RM35LV14MW



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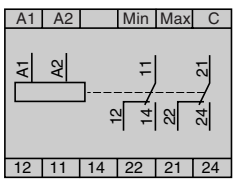
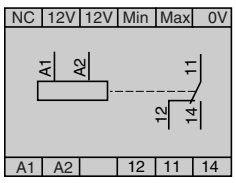
Wiring diagrams

RM35LM33MW



RM35LV14MW



Catalog numbers

Probes

Application	No. of probes	Length in (mm)	Operating temperature °F (°C)	Maximum pressure kg/cm^2	Catalog numbers	Weight lb(kg)
Recommended for drink vending machines and where installation space is limited (stainless steel)	3	39.37 (1000)	176 (80)	2	**RM79696044**	1.763 (0.800)
Suitable for boilers, pressure vessels, and under high temperature conditions *(1)* (304 stainless steel)	1	39.37 (1000)	392 (200)	25	**RM79696014**	0.793 (0.360)

RM79696043

Description	Material	Catalog number	Weight lb(kg)
Protected probe for mounting by suspension	Protective shell PUC (S7) Electrode: stainless steel	**RM79696043**	0.330 (0.150)

LA9RM201

Description	Type of installation	Maximum operating temperature °F (°C)	Catalog numbers	Weight lb(kg)
Liquid level control probe	Suspended by cable	212 (100)	**LA9RM201**	0.220 (0.100)

Electrode holders

Description	Material	Catalog number	Weight lb(kg)
Electrode for use up to 662 °F (350 °C) and 15 kg/cm^2 *(2)*	Stainless steel isolated by ceramic.	**RM79696006**	0.330 (0.150)

RM79696006

(1) 3/8" BSP mounting thread with hexagonal head. Use a 24 mm spanner for tightening.

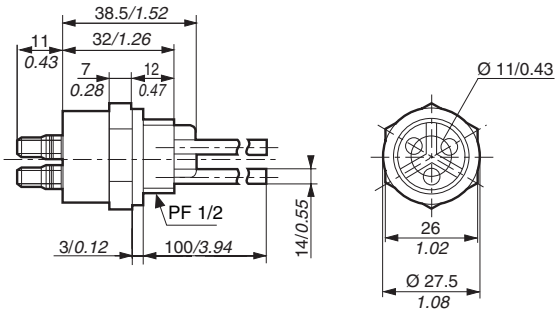
(2) 3/8" BSP mounting thread.

Note: For information on Ultrasonic sensors, go to the Schneider Electric Sensor Competency Center website at www.SESensors.com, or call the Sensor Competency Center Product Support Group toll free at (800) 435-2121.

Approximate dimensions

Probes

RM79696044



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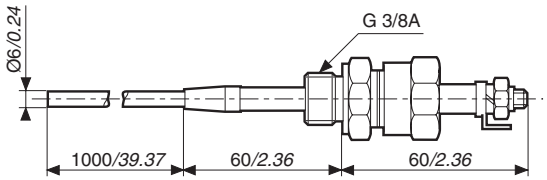
RM79696014



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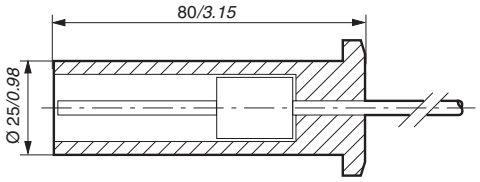
RM79696043



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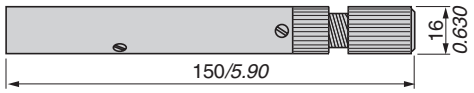
LA9RM201



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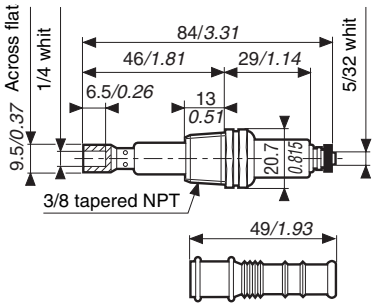
Electrode holder

RM79696006



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105691

RM35BA10

Product description

Measurement and control relay RM35BA10 is used for control and monitoring of 3-phase and single-phase pumps.

It monitors:

- The sequence of phases L1, L2 and L3
- The absence of one or more phases
- Undercurrent for protection against running empty
- Overcurrent for protection against overload

This control relay accepts different nominal voltage values:

- 208–480 Vac in 3-phase mode
- 230 Vac in single-phase mode

It is self-powered and measurements are true rms values.

Settings are protected by a sealable cover.

Control status is indicated by an LED.

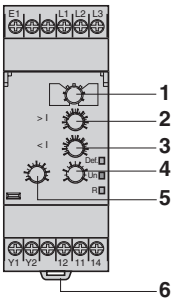
The relay is designed for clip-on mounting on ⊓ rail.

Applications

- Management of pumps

Description

RM35BA



1 Configuration: selection of active function and operating mode, **3ph/1ph** (Double - Single).
2 Overcurrent setting potentiometer, **> I**
3 Undercurrent setting potentiometer, **< I**
4 Time delay adjustment potentiometer, **Tt**
5 Starting inhibition time delay adjustment potentiometer, **Ti**
6 Spring for clip-on mounting on 35 mm ⊓ rail

Def.	Yellow LED: indicates fault present status.
Un	Green LED: indicates that supply to the relay is on.
R	Yellow LED: indicates relay output state.

Operating principle

Pump control relay RM35BA10 can operate on a single-phase or 3-phase supply.

It incorporates 3 functions in a single unit:

- Current control
- Phase presence control (in 3-phase mode)
- Phase sequence control (in 3-phase mode)

It has two operating modes which are designed to control a pump via two external signal inputs (Y1 Y2).

These two signals are controlled by volt-free contacts.

Control inputs Y1 and Y2 can be connected to:

- A level sensor
- A level relay
- A pressure sensor
- A pushbutton

Fault signalling is by LED with differentiation of the cause of the fault.

3-phase and single-phase pump control relay

The operating mode is fixed by the user.

A switch allows selection between the following modes:

- Single control
- Double control
- Single-phase or 3-phase supply

The position of the switch, and therefore the operating mode, is read by the product on energization.

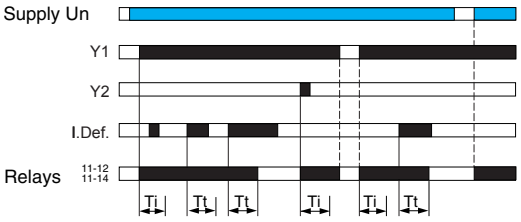
If the switch position is changed while the device is operating, all the LEDs flash, but the product continues to operate normally with the function selected at the time of energization preceding the change of position.

The LEDs return to their normal state if the switch is returned to the original position selected prior to the last energization.

Function diagrams

■ **Functions:**

- Single control mode (3ph/1ph)



Single control mode

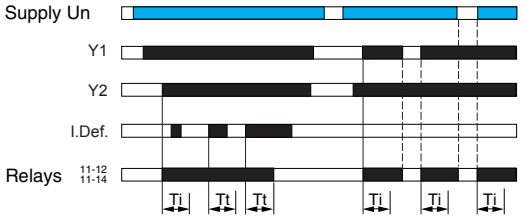
This mode is designed to control a pump via an external signal.

The relay output is closed when the signal is present at Y1 (contact closed).

Y2 can be used to reset the relay after a current fault.

Function diagrams

- Double control mode (3ph/1ph)



Ti: time delay to inhibit fault monitoring on starting of pump (overcurrent and undercurrent, setting on front panel)
Tt: time delay in the event of a fault (overcurrent or undercurrent, setting on front panel)
I. Def.: presence of a current fault (overcurrent or undercurrent)

3-phase and single-phase pump control relay *(continued)*

Double control mode

This mode is designed to control a pump via two external control signals (Y1 and Y2).

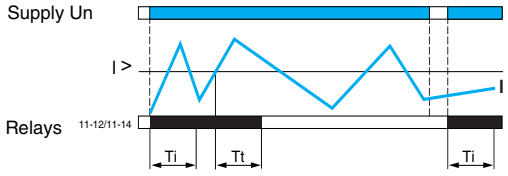
The output relay closes when both input signals are present (Y1 and Y2 closed).

It opens as soon as one of these signals disappears.

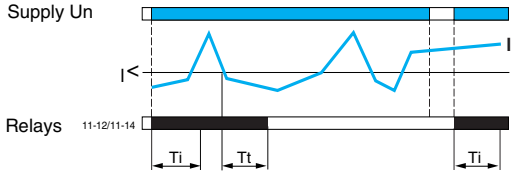
Function diagrams

■ **Functions:**

- Overcurrent detection, **> I**



- Undercurrent detection, **< I**.



Ti: time delay to inhibit fault monitoring on starting of pump (overcurrent and undercurrent, setting on front panel)

Tt: time delay in the event of a fault (overcurrent or undercurrent, setting on front panel)

Single-phase or 3-phase supply

If the control relay is configured for a single-phase supply, it monitors the current consumed by the pump.

If the control relay is configured for a 3-phase supply, it monitors the current, phase sequence and phase failure.

If a phase fault is detected, the output relay opens immediately.

On energization, if there is a phase sequence or phase failure fault, the output is unable to energize.

The overcurrent and undercurrent values are set by two separate potentiometers, graduated from 1 to 10 A.

In the event of a setting error (low threshold greater than high threshold) the output relay opens and all the LEDs flash to signal the error.

If a current fault occurs (overcurrent or undercurrent) the relay opens when the fault persists for longer than the threshold time delay setting.

When the current returns to a correct value, the output relay stays open. It can only be re-energized by a RESET: either by switching off the power, or by closing of external contact Y2 (in single control mode).

An inhibition time delay on energization (Ti) allows detection of current peaks on starting of the motor.

Environment characteristics			
Conforming to standards			NF EN 60255-6 and IEC 60255-6
Product certifications	Pending		UL (File E173076 CNN NRNT), CSA (File 217698 Guide 3211-07), GL, C-Tick, GOST
Marking			CE: 73/23/EEC and EMC 89/336/EEC, RoHS
Ambient air temperature around the device	Storage	**°F (°C)**	- 40 to 158 (- 40 to + 70)
	Operation	**°F (°C)**	- 4 to 122 (- 20 to + 50)
Permissible relative humidity	Conforming to IEC 60068-2-30		2 x 24 hours to + 95 % RH at + 131°F (55 °C) without condensation
Vibration resistance	Conforming to IEC 60068-2-6		0.035 mm from 10–150 Hz
Shock resistance	Conforming to IEC 60068-2-27		5 gn
Degree of protection	Casing		IP 30
Conforming to IEC 60529	Terminals		IP 20
Degree of pollution	Conforming to IEC 60664-1		3
Overvoltage category	Conforming to IEC 60664-1		III
Insulation resistance	Conforming to 60664-1/60255-5		> 500 MΩ, 500 Vdc
Rated insulation voltage	Conforming to IEC 60664-1	**V**	400
Insulation test voltage	Dielectric test	**kV**	2, 50 Hz, 1 min. on Vac
	Shock wave	**kV**	4
Mounting position without derating	In relation to normal vertical mounting plane		Any position
Wiring range Conforming to IEC3 60947-1 and UL 508	Solid cable without cable end	**AWG (mm^2)**	One 14–20 (2.5–0.5) Two 16–20 (1.5–0.5)
	Flexible cable with cable end	**AWG (mm^2)**	One 14–20 (2.5–0.5) Two 16–20 (1.5–0.5)
Tightening torque	Conforming to IEC 60947-1 and UL 508		0.6–1 N.m / *5.3–8.8 lb-in*
Housing material			Self-extinguishing plastic
Power ON indicator			Green LED
Relay state indicator			Yellow LED
Fault indication			Yellow LED
Mounting	Conforming to IEC/EN 60715		On 35 mm ⊓ rail
Supply characteristics			
Rated supply voltage Un	3-phase	**Vac**	208–480
	Single-phase	**Vac**	230
Operating range		**Vac**	183–528
Voltage limits	Of the power supply circuit		- 15 %, + 10 %
Frequency	Of the power supply circuit		50/60 Hz ± 10 %
Galvanic isolation, supply/measurement			No
Maximum power consumption		**VA**	5
Immunity to microbreaks		**ms**	500

Immunity to electromagnetic interference			
Electromagnetic compatibility			Immunity NF EN61000-6-2 / IEC 61000-6-2 Emission NF EN 61000-6-4, NF EN 61000-6-3, IEC 61000-6-4, IEC 61000-6-3
Measurement circuit and input characteristics			
Measurement range		**A**	1–10 on Vac
Input resistance		Ω	E1 - L2 : 0.01
Overload	Permanent at 77 °F (25 °C)	**A**	11 (E1-L2)
	Non repetitive < 1 s at 77 °F (25 °C)	**A**	50 (E1-L2)
Frequency of the measured signal		**Hz**	50–60 ± 10 %
Maximum measuring cycle		**ms**	140/measurement as true rms value
Hysteresis			5 % of the threshold
Setting accuracy			± 10 % of the threshold setting (of the full scale value)
Repeat accuracy (with constant parameters)			± 1 %
Measurement error with voltage variation			1 % / V over the whole range
Measurement error with temperature variation			± 0.05 % / °C
Time delay characteristics			
Time delay on energization Ti		**s**	1–60. 0 + 10 %
Time delay on crossing the threshold Tt		**s**	0.1–10. 0 + 10 %
Repeat accuracy (with constant parameters)			± 1 %
Reset time		**s**	2
Minimum duration Y2 (reset)		**ms**	300
Response time in the event of a fault		**ms**	< 300
Delay on pick-up		**ms**	500
Output characteristics			
Type of output			1 C/O contact
Contact type			Cadmium-free
Maximum switching voltage		**Vac/Vdc**	250
Rated breaking capacity		**VA**	1250
Current rating		**A**	5 (1 A at 24 Vdc, 5 A at 24 Vac, 3 A at 250 Vac)
Minimum breaking current			10 mA/5 Vdc
Mechanical durability ▲			30 x 10^6 operating cycles
Electrical durability ▲			1 x 10^5 operating cycles
Maximum operating rate			360 operations/hour under full load
Utilization categories	Conforming to IEC 60947-5-1		AC-12, AC-13, AC-14, AC-15, DC-12, DC-13

▲ The expected life expressed above is based on average usage and normal operating conditions. Actual operating life will vary with conditions. The above statements are not intended to nor shall they create any expressed or implied warranties as to product operation or life. For information on the listed warranty offered on this product, refer to the Square D Conditions of Sale found in the Digest.

Catalog number

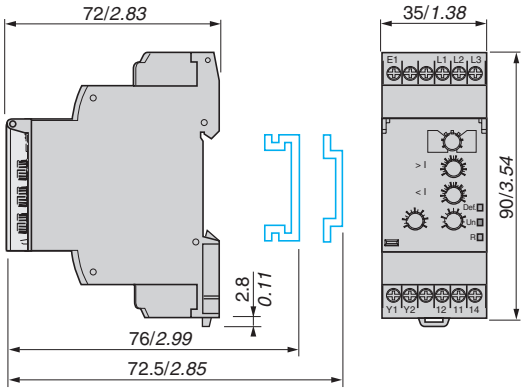
105691

RM35BA10

Function	Current range controlled A	Supply voltage Vac	Output	Catalog number	Weight lb(kg)
3-phase: • Phase sequence • Phase failure • Overcurrent and undercurrent control **Single-phase:** • Overcurrent and undercurrent control	1–10	• 208–480, 3-phase. • 230, single-phase.	1 C/O 5 A	**RM35BA10**	0.242 (0.110)

Approximate dimensions

RM35BA10



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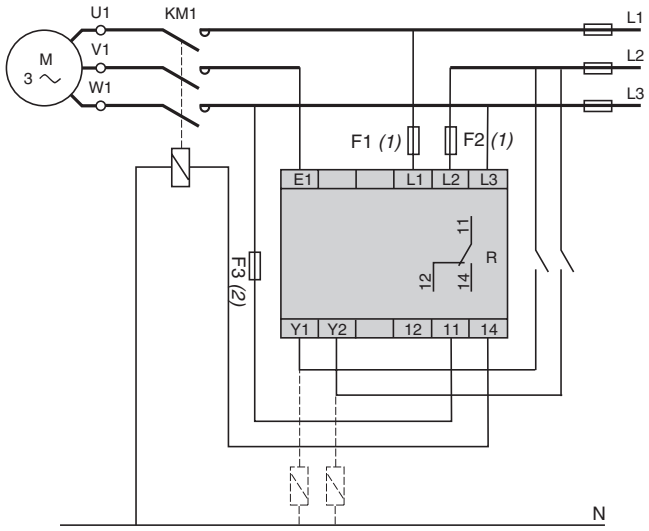
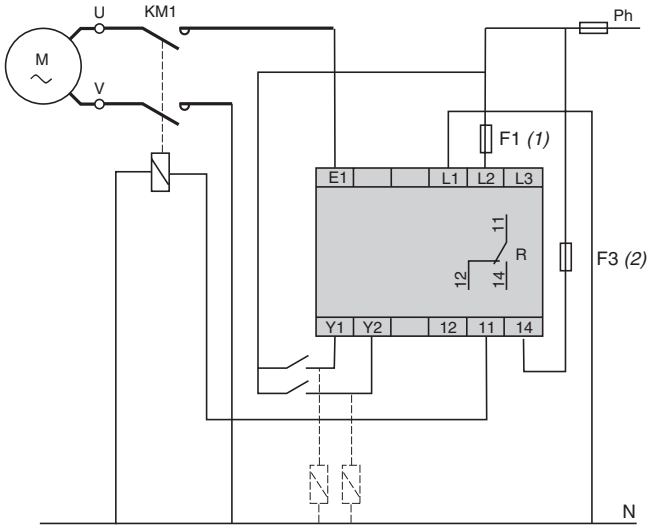
RM35BA10

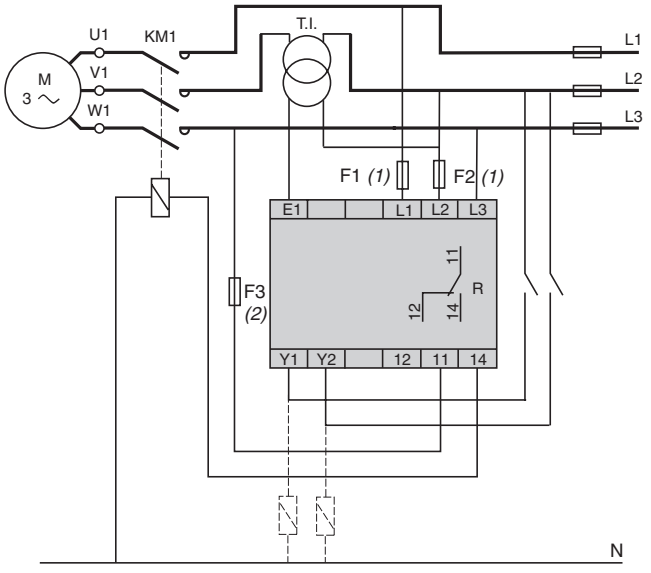
3-phase < 10 A



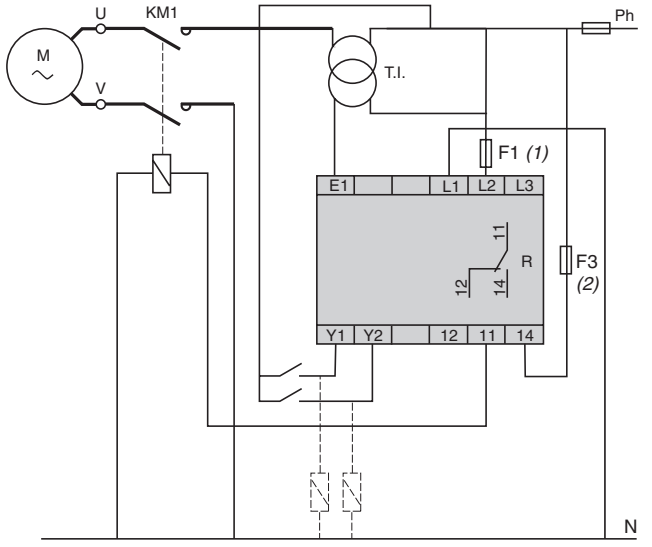
Single-phase 230 Vac < 10 A



3-phase > 10 A



Single-phase 230 Vac > 10 A



(1) 100 mA fast-acting fuse—UL = Class CC; IEC = gG

(2) Fuse size is dependent on size of the load being switched.

105684

RM35HZ21FM

Product description

Frequency control relay RM35HZ monitors frequency variations on 50 or 60 Hz a.c. supplies:

- Over-frequency and under-frequency with two independent relay outputs
- Selectable memory function

It monitors its own supply voltage, measured as a true rms value.

Settings are protected by a sealable cover.

Control status is indicated by an LED.

The relay is designed for clip-on mounting on ⊓ rail.

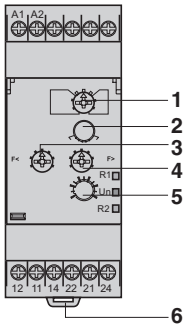
Applications

Monitoring of electrical power sources:

- Generating sets, wind turbines, micro-power stations

Description

RM35HZ21FM



1 Configuration: selection of 50/60 Hz frequency range and operating mode (with or without memory), **Memory - No Memory**

2 Frequency threshold multiplication switch, **x1-x2**

3 Low frequency threshold setting switch, **F <**

4 High frequency threshold setting switch, **F >**

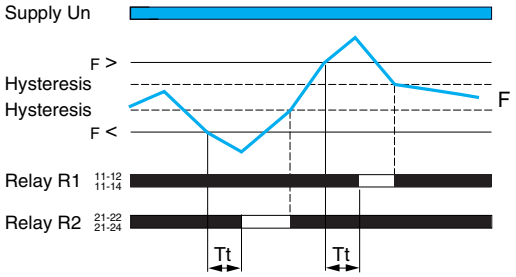
5 Time delay adjustment potentiometer

6 Spring for clip-on mounting on 35 mm ⊓ rail

R1	Yellow LED: indicates relay state (high frequency threshold).
Un	Green LED: indicates that supply to the relay is on.
R2	Yellow LED: indicates relay state (low frequency threshold).

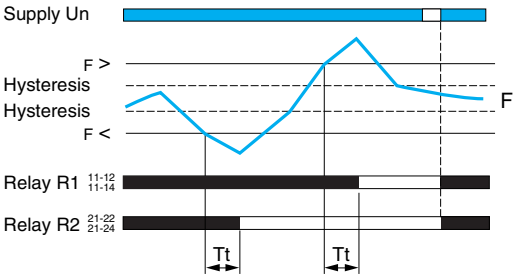
Function diagrams

- Function: Over-frequency and under-frequency control
- **Without Memory**



Tt: time delay after crossing of threshold (adjustable on front panel)

- **With Memory**



Tt: time delay after crossing of threshold (adjustable on front panel)

Operating principle

Frequency control relay RM35HZ monitors:

- Frequency variations on 50 or 60 Hz supplies
- It allows monitoring of over-frequency and under-frequency, via adjustment of two independent thresholds. It has two relay outputs: one per threshold.

Fault signalling is by LED.

■ **Function selector switch:**

- Set the switch to 50 or 60 Hz according to the supply monitored, then select Memory or No memory mode. The position of the switch, and therefore the operating mode, is read by the product on energization.
- If the switch is set to an unacceptable position, the product detects a fault, the output relays stay open and the LEDs flash to signal the position error.
- If the switch position is changed while the device is operating, all the LEDs flash, but the product continues to operate normally with the function selected at the time of energization preceding the change of position.
- The LEDs return to their normal state if the switch is returned to the original position selected prior to the last energization.

■ **The relay monitors its own supply voltage Un**:

The under-frequency or over-frequency threshold values are set by means of two graduated potentiometers indicating the variation value of the frequency to be monitored.

A switch **x1** / **x2** allows the control scale to be doubled. Hysteresis is fixed at 0.3 Hz.

If the frequency of the voltage controlled exceeds the over-frequency threshold setting for a time greater than that set on the front panel (0.1–10 s), the corresponding output relay opens and its LED goes out. During the time delay, this LED flashes.

As soon as the frequency drops below the value of the threshold setting, minus the hysteresis, the relay closes.

If the frequency of the voltage controlled falls below the under-frequency threshold setting for a time greater than that set on the front panel (0.1–10 s), the corresponding output relay opens and its LED goes out. During the time delay, this LED flashes.

As soon as the frequency rises above the value of the threshold setting, plus the hysteresis, the relay closes.

On energization of the device with a fault measured, the relay stays open.

■ **Memory mode:**

If Memory mode is selected, the relay opens after the time delay and stays in that position when crossing of the threshold is detected.

The power must be switched off to reset the product.

Environment characteristics			
Conforming to standards			NF EN 60255-6 and IEC 60255-6
Product certifications	Pending		UL (File E173076 CNN NRNT), CSA (File 217698 Guide 3211-07), GL, C-Tick, GOST
Marking			CE: 73/23/EEC and EMC 89/336/EEC, RoHS
Ambient air temperature around the device	Storage	**°F (°C)**	- 40 to 158 (- 40 to + 70)
	Operation	**°F (°C)**	- 4 to 122 (- 20 to + 50)
Permissible relative humidity	Conforming to IEC 60068-2-30		2 x 24 hours to + 95 % RH at + 131°F (55 °C) without condensation
Vibration resistance	Conforming to IEC 60068-2-6		0.035 mm from 10–150 Hz
Shock resistance	Conforming to IEC 60068-2-6		5 gn
Degree of protection	Casing		IP 30
Conforming to IEC 60529	Terminals		IP 20
Degree of pollution	Conforming to IEC 60664-1		3
Overvoltage category	Conforming to IEC 60664-1		III
Insulation resistance	Conforming to 60664-1/60255-5		> 500 MΩ, 500 Vdc
Rated insulation voltage	Conforming to IEC 60664-1	**V**	400
Insulation test voltage	Dielectric test	**kV**	2, 50 Hz, 1 min. on Vac
	Shock wave	**kV**	4
Mounting position without derating	In relation to normal vertical mounting plane		Any position
Wiring range Conforming to IEC3 60947-1 and UL 508	Solid cable without cable end	**AWG (mm^2)**	One 14–20 (2.5–0.5) Two 16–20 (1.5–0.5)
	Flexible cable with cable end	**AWG (mm^2)**	One 14–20 (2.5–0.5) Two 16–20 (1.5–0.5)
Tightening torque	Conforming to IEC 60947-1 and UL 508		0.6–1 N.m / *5.3–8.8 lb-in*
Housing material			Self-extinguishing plastic
Power ON indicator			Green LED
Relay state indication (R1-R2)			Yellow LEDs. These LEDs flash during the delay on crossing the threshold
Mounting	Conforming to IEC/EN 6071		On 35 mm ⊓ rail
Supply characteristics			
Rated supply voltage Un		**Vac**	120–277
Operating range		**Vac**	102–308
Voltage limits	Of the power supply circuit		- 15 %, + 10 Hz
Frequency	Of the power supply circuit		50/60 Hz ± 10 Hz
Galvanic isolation, supply/measurement			No
Maximum power consumption		**VA**	6 on Vac
Immunity to microbreaks		**ms**	10
Immunity to electromagnetic interference			
Electromagnetic compatibility			Immunity NF EN 61000-6-2 / IEC 61000-6-2 Emission NF EN 61000-6-4, NF EN 61000-6-3, IEC 61000-6-4, IEC 61000-6-3
Measurement circuit and input characteristics			
Measurement range		**Hz**	40–70
Frequency of the measured signal		**Hz**	40–70
Maximum measuring cycle		**ms**	200, measured as true rms value
Threshold setting		**Hz**	- 10 to + 2 and - 2 to + 10
Adjustable or fixed hysteresis		**Hz**	0.3 fixed
Setting accuracy			± 10 % of the full scale value
Repeat accuracy (with constant parameters)			± 0.5 %
Measurement error with voltage variation			< ± 1 % over the whole range
Measurement error with temperature variation			± 0.05 % / °C
Maximum frequency of input signals		**Hz**	70 max
Time delay characteristics			
Time delay on crossing the threshold		**s**	0.1–10, 0 + 10 %
Setting accuracy			± 10 % of the full scale value
Repeat accuracy (with constant parameters)			± 0.5 %
Reset time		**ms**	2000
Delay on pick-up		**ms**	500

Output characteristics

Output type		1 C/O + 1 C/O contacts
Contact type		Cadmium-free
Current rating—Resistive (Inductive)	**A**	5 (1 A at 24 Vdc, 5 A at 24 Vac, 3 A at 250 Vac)
Maximum switching voltage	**Vac/Vdc**	250
Rated breaking capacity	**VA**	1250
Minimum breaking current	**mA**	10/5 Vdc
Electrical durability ▲		1 x 10^5 operating cycles
Mechanical durability ▲		30 x 10^6 operating cycles
Maximum operating rate		360 operations/hour under full load
Utilization categories Conforming to IEC 60947-5-1		AC-12, AC-13, AC-14, AC-15, DC-12, DC-13, DC-14

▲ The expected life expressed above is based on average usage and normal operating conditions. Actual operating life will vary with conditions. The above statements are not intended to nor shall they create any expressed or implied warranties as to product operation or life. For information on the listed warranty offered on this product, refer to the Square D Conditions of Sale found in the Digest.

Catalog number

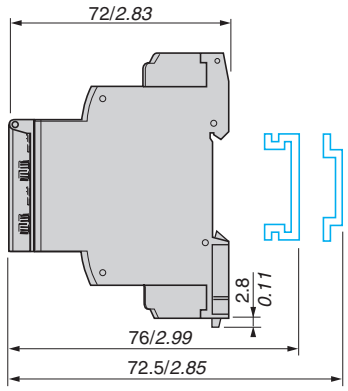
105684

RM35HZ21FM

Function	Range controlled	Supply voltage Vac	Output	Catalog number	Weight lb(kg)
• Over-frequency and under-frequency 50 or 60 Hz	40–60 Hz (50 Hz) / 50–70 Hz (60 Hz)	120–277	1 C/O + 1 C/O 5 A	**RM35HZ21FM**	0.286 (0.130)

Approximate dimensions

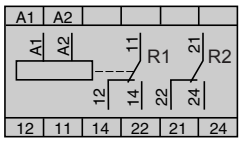
RM35HZ21FM



mm/*In.*

Wiring diagram

RM35HZ21FM



105687

RM35S0MW

Product description

Speed control relay RM35S0MW monitors:

■ Underspeed:

- without memory
- with memory
- with inhibition by external contact S2

■ Overspeed:

- without memory
- with memory
- with inhibition by external contact S2

Speed control relay RM35 S0MW measures via:

- A 3-wire PNP or NPN proximity sensor input
- A Namur proximity sensor input
- A 0-30 V voltage input
- A volt-free contact input

It operates with either N.O. or N.C. sensors.
The adjustable time between impulses is 0.05 s to 10 min.
The power-on inhibition time is adjustable from 0.6 to 60 s.
Inhibition is controlled by an external contact.

Settings are protected by a sealable cover.

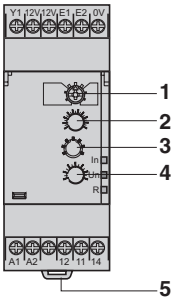
Control status is indicated by an LED.

The relay is designed for clip-on mounting on ⊓ rail.

Applications

- Monitors speed or rate of rotary or linear movements in the following applications:
  - — conveyors/conveyor belts
  - — packaging
  - — mechanical handling

Description
RM35S00MW



1 Configuration: selection of operating mode: underspeed or overspeed, **Underspeed/Overspeed** with or without memory, **Memory - No Memory**

2 Speed threshold setting potentiometer, **Value**

3 Speed range selector switch

4 Starting inhibition time delay adjustment potentiometer, **Ti**

5 Spring for clip-on mounting on 35 mm ⊓⊔ rail

In	Yellow LED: indicates inhibition status (time-delay or S2 input).
Un	Green LED: indicates that supply to the relay is on.
R	Yellow LED: indicates relay output state.

Operating principle

Relay RM35S0MW monitors the speed (rate, frequency) of a process (conveyor, conveyor belt, etc.) via discrete sensors:

- 3-wire PNP or NPN proximity sensor
- 0-30 V voltage input
- NAMUR proximity sensor
- Volt-free contact

It can be used for monitoring underspeed or overspeed.

Speed control relay: RM35S0MW

■ Measurement

The cycle of the process being monitored is the series of impulses characterized by a two-state signal: high and low. The speed measurement is obtained by measuring the period of this signal, from the first change of state detected (either rising or falling edge). Digital processing of the signal allows the disparity between the signals to be calculated. At power up, or after appearance (or reappearance) of the sensor signal, detection of the signal requires processing of one or more periods (maximum of two). During this time, control is inoperative.

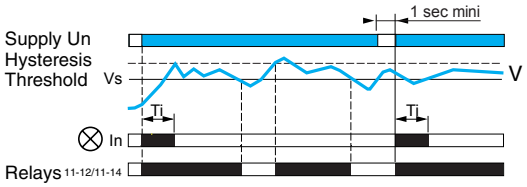
■ Operating mode

Using the switch, select one of the four operating modes:

- Underspeed without memory
- Underspeed with memory
- Overspeed without memory
- Overspeed with memory

Function diagrams

- Function: Underspeed control**, - Underspeed**
- **Without Memory**



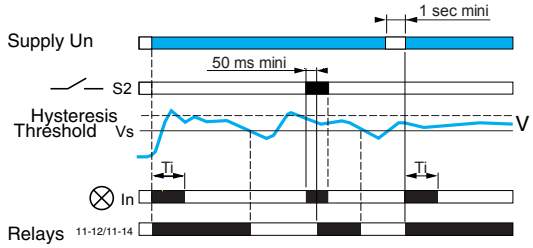
■ Underspeed control

At the end of the starting inhibition time delay Ti, as soon as the speed measured drops below the threshold setting, the output relay changes state from closed to open.

It returns to its initial state when the speed is again higher than the threshold plus hysteresis (fixed at 5% of the threshold setting).When power is restored, after a break of at least 1 s, the relay is in the on (normal) state during the time delay and stays in that state for as long as the speed remains higher than the threshold.

Function diagrams *(continued)*

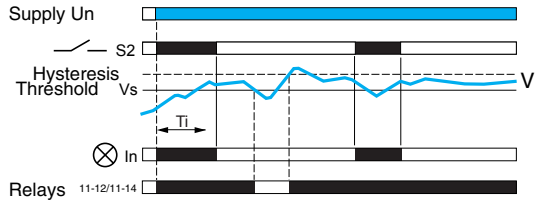
- **With Memory**



Speed control relay: RM35S0MW *(continued)*

When relay RM35S is configured to memory mode, if underspeed is detected, the output relay stays in the off (alarm) state whatever the further evolution of the process speed. It cannot return to the on (normal) state until contact S2 closes (for at least 50 ms). When S2 re-opens, if the speed is not high enough, the relay returns to the locked, off (alarm) state. Relay RM35S can also be reset by a power break of at least 1 s; the relay then returns to the on (normal) state for at least the duration of the time delay, whatever the process speed.

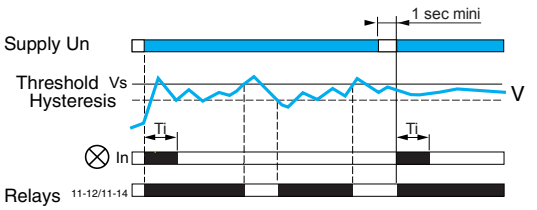
- **With inhibition by S2 - Inhib./S2.**



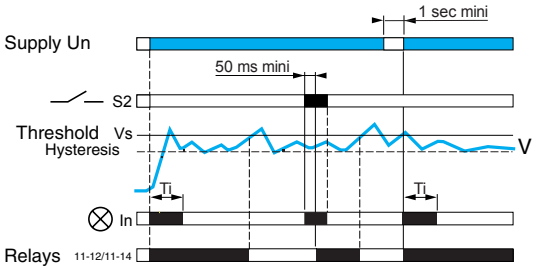
At power up, in order to allow the process being monitored to reach its nominal operating speed, relay RM35S is inhibited for a time delay adjustable from 0.6–60 s. This time delay can be adjusted (shortened or lengthened) during inhibition. Relay RM35S can also be inhibited by closing of contact S2: on starting, for example, if the process run up to speed time is greater than 60 s, or at any time during operation. Whether it results from a starting inhibition time delay or closing of S2, inhibition keeps the output relay in the closed position and is signalled by illumination of the inhibition LED. If, after lifting of inhibition (end of starting inhibition time delay or opening of contact S2), the signal detection phase has not been completed, the relay drops out after the set wait time between two impulses (measured as from the end of inhibition). Inhibition must last as long as is necessary for the product to detect at least 2 periods. When the signal has not been characterized by the end of the inhibition period, the inhibition LED flashes for as long as speed measurement is impossible. It is also possible to inhibit relay RM35S at any time, during operation, by closing S2.

Function diagrams

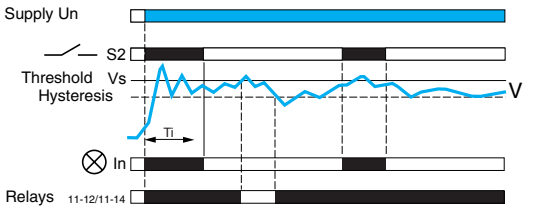
- Function: overspeed control - **Overspeed**
- **Without Memory**



- **With Memory**



- **With inhibition by S2. - Inhib./S2**



Speed control relay: RM35S0MW *(continued)*

■ Overspeed control

At the end of the starting inhibition time delay, Ti, as soon as the speed measured is higher than the threshold setting, the output relay changes state from closed to open.

It returns to its initial state when the speed is again lower than the threshold minus hysteresis (fixed at 5% of the threshold setting).

When power is restored to relay RM35S, after a break of at least 1 s, the relay is in the on (normal) state during the time delay and stays in that state for as long as the speed remains lower than the threshold.

When relay RM35S is configured to memory mode, if overspeed is detected, the output relay stays in the off (alarm) state whatever the further evolution of the process speed.

It cannot return to the on (normal) state until contact S2 closes (for at least 50 ms).

When S2 re-opens, if the speed is too high, the relay returns to the locked off (alarm) state.

Relay RM35S can also be reset by a power break of at least 1 s; the relay then returns to the on (normal) state for at least the duration of the time delay, whatever the process speed.

At power up, in order to allow the process being monitored to reach its nominal operating speed, relay RM35S is inhibited for a time delay adjustable from 0.6–60 s. This time delay can be modified (shortened or lengthened) during inhibition.

Relay RM35S can also be inhibited by closing of contact S2: on starting, for example, if the process run up to speed time is greater than 60 s, or at any time during operation.

Whether it results from a starting inhibition time delay or closing of S2, inhibition keeps the output relay in the closed position and is signalled by illumination of the inhibition LED.

If, after lifting of inhibition (end of starting inhibition time delay or opening of contact S2), the signal detection phase has not been completed, the relay drops out after the set wait time between two impulses (measured as from the end of inhibition).

Inhibition must last as long as is necessary for the product to detect at least 2 periods.

When the signal has not been characterized by the end of the inhibition period, the inhibition LED flashes for as long as speed measurement is impossible.

It is also possible to inhibit relay RM35S at any time, during operation, by closing S2.

Environment characteristics			
Conforming to standards			NF EN 60255-6 and IEC 60255-6
Product certifications	Pending		UL (File E173076 CNN NRNT), CSA (File 217698 Guide 3211-07), GL, C-Tick, GOST
Marking			CE: 73/23/EEC and EMC 89/336/EEC, RoHS
Ambient air temperature around the device	Storage	**°F (°C)**	- 40 to 158 (- 40 to + 70)
	Operation	**°F (°C)**	- 4 to 122 (- 20 to + 50)
Permissible relative humidity	Conforming to IEC 60068-2-30		2 x 24 hours to + 95 % RH at + 131°F (55 °C) without condensation
Vibration resistance	Conforming to IEC 60068-2-6		0.035 mm from 10–150 Hz
Shock resistance	Conforming to IEC 60068-2-6		5 gn
Degree of protection	Casing		IP 30
Conforming to IEC 60529	Terminals		IP 20
Degree of pollution	Conforming to IEC 60664-1		3
Overvoltage category	Conforming to IEC 60664-1		III
Insulation resistance	Conforming to IEC 60664-1, 60255-5		> 500 MΩ, 500 Vdc
Rated insulation voltage	Conforming to IEC 60664-1	**V**	250
Insulation test voltage	Dielectric test	**kV**	2, 50 Hz, 1 min. on Vac
	Shock wave	**kV**	4
Mounting position without derating	In relation to normal vertical mounting plane		Any position
Wiring range Conforming to IEC3 60947-1 and UL 508	Solid cable without cable end	**AWG (mm^2)**	One 14–20 (2.5–0.5) Two 16–20 (1.5–0.5)
	Flexible cable with cable end	**AWG (mm^2)**	One 14–20 (2.5–0.5 Two 16–20 (1.5–0.5)
Tightening torque	Conforming to IEC 60947-1 and UL 508		0.6–1 N.m / *5.3–8.8 lb-in*
Housing material			Self-extinguishing plastic
Power ON indicator			Green LED
Relay state indicator (R)			Yellow LED
Inhibit status indication			Yellow LED
Mounting	Conforming to IEC/EN 60715		On 35 mm ⊓ rail
Supply characteristics			
Rated supply voltage Un		**Vac/Vdc**	24–240
Operating range		**Vac/Vdc**	20.4–264
Polarity on d.c. supply			No
Voltage limits	Of the power supply circuit		- 15 %, + 10 %
Frequency	Of the power supply circuit		50/60 Hz ± 10 %
Galvanic isolation, supply/measurement			Yes
Maximum power consumption			5 VA on Vac / 3 W on Vdc
Immunity to microbreaks		**ms**	50
Sensor supply characteristics			
Nominal voltage		**V**	12 ± 0,5
Available current		**mA**	50 for 24 Vac/Vdc ⩽ Un ⩽ 240 Vac/Vdc 40 for Un < 24 Vac/Vdc at 77 °F (25 °C)
Immunity to electromagnetic interference			
Electromagnetic compatibility			Immunity NF EN 61000-6-2 / IEC 61000-6-2 Emission NF EN 61000-6-4, NF EN 61000-6-3, IEC 61000-6-4, IEC 61000-6-3

Measurement circuit and input characteristics			
Input circuit	3-wire sensor (E1)		PNP or NPN, 12 V, 50 mA max
	NAMUR sensor (E2)		12 V, 1.5 kΩ
	Volt-free contact input (E1)		12 V, 9.5 kΩ
	Voltage input (E1)		Voltage range: 0 V min, 30 V max Input resistance: 9.5 kΩ High state: 4.5 V min Low state: 1 V max
Minimum impulse time	At high state	**ms**	5
	At low state	**ms**	5
Measurement range			0.05–0.5 s 0.1–1 s 0.5–5 s 1–10 s 0.1–1 min 0.5–5 min 1–10 min
Threshold setting			10–100 % of the range
Fixed hysteresis			5 % of the threshold setting
Setting accuracy			± 10 % of the full scale value
Repeat accuracy (with constant parameters)			± 0.5 %
Measurement error with voltage variation			< 1 % over the whole range
Measurement error with temperature variation			± 0,1 % / °C max
Frequency of input signals		**Hz**	1.7 mHz min, 20 Hz max
Time delay characteristics			
Response time on crossing the threshold		**ms**	15 max
Repeat accuracy (with constant parameters)			± 0.5 %
Reset time in memory mode	Contact S2	**ms**	50 minimum
	Supply Un	**s**	1
Inhibition time delay	On energization		0.6–60 s +10 % of the full scale value
Delay on pick-up		**ms**	50
Output characteristics			
Output type			1 C/O contact
Contact type			Cadmium-free
Current rating—Resistive (Inductive)		**A**	5 (1 A at 24 Vdc, 5 A at 24 Vac, 3 A at 250 Vac)
Maximum switching voltage		**Vac/Vdc**	250
Rated breaking capacity		**VA**	1250
Minimum breaking current		**mA**	10/5 Vdc
Electrical durability ▲			1 x 10^5 operating cycles
Mechanical durability ▲			30 x 10^6 operating cycles
Maximum operating rate			360 operations/hour under full load
Utilization categories	Conforming to IEC 60947-5-1		AC-12, AC-13, AC-14, AC-15, DC-12, DC-13, DC-14

▲ The expected life expressed above is based on average usage and normal operating conditions. Actual operating life will vary with conditions. The above statements are not intended to nor shall they create any expressed or implied warranties as to product operation or life. For information on the listed warranty offered on this product, refer to the Square D Conditions of Sale found in the Digest.

Catalog number

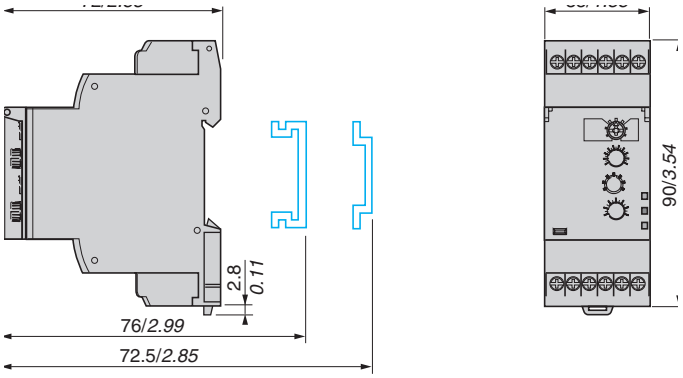
105687

RM35S0MW

Function	Supply Vac/Vdc	Measurement Input	Output	Catalog number	Weight lb (kg)
• Underspeed • Overspeed	24–240	• 3-wire PNP or NPN proximity sensor, • Namur proximity sensor, • 0-30 V voltage, • Volt-free contact.	1 C/O 5 A	**RM35S0MW**	0.286 (0.130)

Approximate dimensions

RM35S0MW



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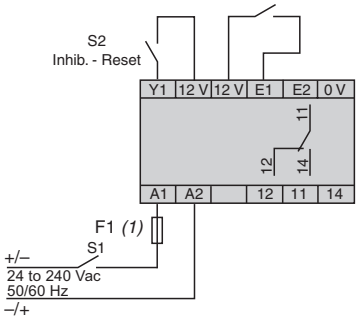
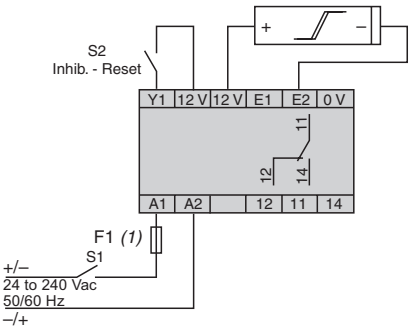
Wiring diagrams

RM35S0MW

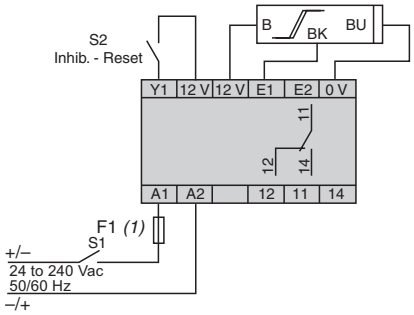
Contact input



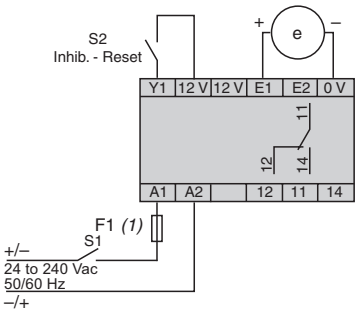
Namur proximity sensor input



NPN/PNP sensor input



0-30 V voltage input



(1) 100 mA fast-acting fuse—UL = Class CC; IEC = gG

105688

RM35AT●0MW

Product description

Measurement and control relays RM35ATL0MW, RM35ATR5MW and RM35ATW5MW are designed for monitoring the temperature in elevator machine rooms, in compliance with directive EN81.

- PT 100 input
- Adjustable control around 41 °F (5 °C) and 104 °F (40 °C)
- Independent adjustment of high and low thresholds
- Possibility of integrated phase control

Settings are protected by a sealable cover.

Control status is indicated by an LED.

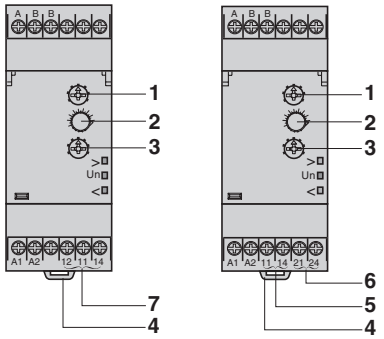
The relays are designed for clip-on mounting on ⊓ rail.

Applications

- Temperature control for elevator machine rooms.

Product description

RM35ATL0MW **RM35ATR5MW**



1 High temperature threshold setting potentiometer, $\theta^{>}$

2 Potentiometer for adjustment of time delay on crossing of temperature threshold, **Tt**

3 Low temperature threshold setting potentiometer, $\theta^{<}$

4 Spring for clip-on mounting on 35 mm ⊓ rail

5 High temperature threshold contact (11-14)

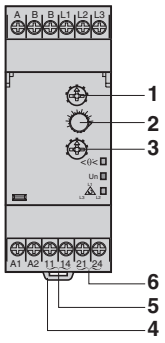
6 Low temperature threshold contact (21-24)

7 High and low temperature threshold contacts

>	Yellow LED: indicates relay output state (high temperature threshold).
Un	Green LED: indicates that supply to the relay is on.
<	Yellow LED: indicates relay output state (low temperature threshold).

Product description *(continued)*

RM35ATW5MW



1 High temperature threshold setting potentiometer, $\theta^{>}$

2 Potentiometer for adjustment of time delay on crossing of temperature threshold, **Tt**

3 Low temperature threshold setting potentiometer, $\theta^{<}$

4 Spring for clip-on mounting on 35 mm ⊓ rail

5 Temperature relay contact (11-14)

6 Phase relay contact (21-44)

<θ°<	Yellow LED: indicates temperature relay output state. **R1**
Un	Green LED: indicates that supply to the relay is on.
L1 L3 L2	Yellow LED: indicates phase relay output state. **R2**

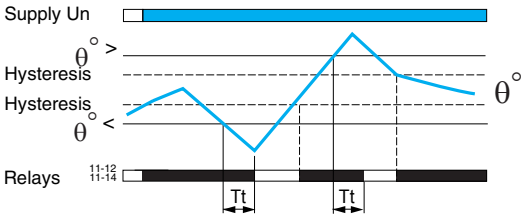
Operating principle

Temperature control relays for elevator machine rooms are designed to monitor the temperature between 41 °F (5 °C) and 104 °F (40 °C) in compliance with directive EN81.

Function diagram

■ **Function:**

• Temperature control by PT 100 probe



Tt: Time delay after crossing of the temperature threshold (adjustable on front panel)

Temperature control relay: RM35ATL0MW

After a delay on pick-up after energization, and for as long as the temperature monitored by the PT100 probe remains between the two thresholds set on the front panel, the output relay is closed and the yellow LEDs are on.

When the temperature crosses one of the threshold settings on the front panel (high or low threshold), the time delay set on the front panel (**Tt**) is activated. The yellow LED corresponding to the threshold crossed (low or high), flashes.

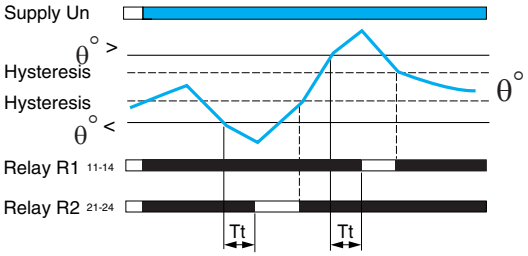
At the end of the time delay, if the temperature is still outside the threshold setting, the output relay opens and the yellow LED corresponding to the threshold crossed goes out.

The output relay closes instantly (within the response time on disappearance of a fault) when the temperature returns within the window of the two threshold settings on the front panel, plus the fixed hysteresis. If the PT 100 probe is incorrectly wired (missing or short-circuited) the relay is open and the 3 LEDs flash.

Function diagram

■ **Function:**

• Temperature control by PT 100 probe



Tt: Time delay after crossing of the temperature threshold (adjustable on front panel)

Temperature control relay: RM35ATR5MW

After a delay on pick-up after energization, and for as long as the temperature monitored by the PT100 probe remains between the two threshold settings on the front panel, the output relays are closed and their yellow LEDs are on.

When the temperature crosses one of the threshold settings on the front panel (high or low threshold), the time delay set on the front panel (**Tt**) is activated. The yellow LED corresponding to the threshold crossed (low or high), flashes.

At the end of the time delay, if the temperature is still outside one of the threshold settings, the corresponding output relay opens and the yellow LED corresponding to the threshold crossed goes out.

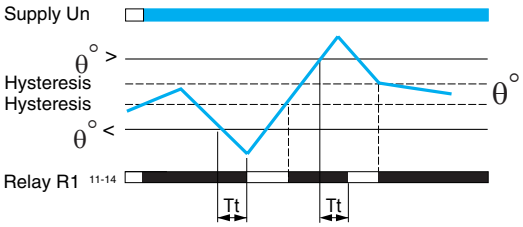
The output relay closes instantly (response time on disappearance of a fault) when the temperature returns within the window of the two threshold settings on the front panel, plus (or minus) the fixed hysteresis.

If the PT 100 probe is incorrectly wired (missing or short-circuited) the relays are open and the 3 LEDs flash.

Function diagram

■ **Function:**

- Temperature control by PT 100 probe
- Sequence of phases L1, L2, L3
- Phase failure



Tt: Time delay after crossing of the temperature threshold (adjustable on front panel)

Temperature and phase control relay: RM35ATW5MW

After a delay on pick-up after energization, and for as long as the temperature monitored by the PT100 probe remains between the two threshold settings on the front panel, the temperature relay **R1** is closed. When the temperature crosses one of the threshold settings on the front panel (high or low threshold), the time delay set on the front panel (**Tt**) is activated. The yellow temperature LED flashes. At the end of the time delay, if the temperature is still outside the threshold setting, the output relay **R1** opens and the yellow LED goes out.

The output relay **R1** closes instantly when the temperature returns to within the window of the two threshold settings on the front panel, plus or minus the fixed hysteresis.

The device also monitors the correct sequence of phases L1, L2 and L3 of the 3-phase supply and total phase failure, even in the case of phase regeneration (< 70%).

After a delay on pick-up after energization, and for as long as phase presence and phase sequence are correct, relay **R2** and the "phase" LED are On. When a fault appears, the "phase" relay opens and the "phase" LED instantly goes out (response time on appearance of a fault).

When the fault disappears, the phase control relay and LED are activated (response time on disappearance of a fault).

If the PT 100 probe is incorrectly wired (missing or short-circuited) relay **R1** is open and LED **R1** flashes.

Environment characteristics

Relay type			RM35ATL0MW	RM35ATR5MW	RM35ATW5MW
Conforming to standards			NF EN 60255-6 and IEC 60255-6		
Product certifications	Pending		UL (File E173076 CNN NRNT), CSA (File 217698 Guide 3211-07), GL, C-Tick, GOST		
Marking			CE: 73/23/EEC and EMC 89/336/EEC, RoHS		
Ambient air temperature around the device	Storage	**°F (°C)**	- 40 to 158 (- 40 to + 70)		
	Operation	**°F (°C)**	- 4 to 122 (- 20 to + 50)		
Permissible relative humidity	Conforming to IEC 60068-2-30		2 x 24 hours to + 95 % RH at + 131°F (55 °C) without condensation		
Vibration resistance	Conforming to IEC 60068-2-6		0.035 mm from 10–150 Hz		
Shock resistance	Conforming to IEC 60068-2-6		5 gn		
Degree of protection	Casing		IP 30		
Conforming to IEC 60529	Terminals		IP 20		
Degree of pollution	Conforming to IEC 60664-1		3		
Overvoltage category	Conforming to IEC 60664-1		III		
Insulation resistance	Conforming to 60664-1/60255-5		> 100 MΩ, 500 Vdc		
Rated insulation voltage	Conforming to IEC 60664-1	**V**	250	250	400
Insulation test voltage	Dielectric test	**kV**	2, 50 Hz, 1 min. on Vac		
	Shock wave	**kV**	4		
Mounting position without derating	In relation to normal vertical mounting plane		Any position		
Wiring range Conforming to IEC 60947-1 and UL 508	Solid cable without cable end	**AWG (mm^2)**	One 14–20 (2.5–0.5) Two 16–20 (1.5–0.5)		
	Flexible cable with cable end	**AWG (mm^2)**	One 14–20 (2.5–0.5) Two 16–20 (1.5–0.5)		
Tightening torque	Conforming to IEC 60947-1 and UL 508		0.6–1 N.m / *5.3–8.8 lb-in*		
Housing material			Self-extinguishing plastic		
Power ON indicator			Green LED	Green LED	Green LED
Relay state indicator	High threshold		Yellow LED	Yellow LED	–
	Low threshold		Yellow LED	Yellow LED	–
	High threshold/low threshold		–	–	Yellow LED
	Phases		–	–	Yellow LED
Mounting	Conforming to IEC/EN 60715		On 35 mm ⊓ rail		

Supply characteristics

Relay type			RM35ATL0MW	RM35ATR5MW	RM35ATW5MW
Rated supply voltage Un		**Vac/Vdc**	24–240		
Operating range		**V**	20.4–264 Vac 21.6–264 Vdc		
Voltage limits	Of the power supply circuit	**ac** **dc**	- 15 %, + 10 % - 10 %, + 10 %		
Frequency	Of the power supply circuit	**Hz**	50/60 Hz ± 10 %		
Galvanic isolation, supply/measurement			Yes		No
Maximum power consumption at Un			3.5 on Vac		
		W	0.6 on Vdc		
Immunity to microbreaks		**ms**	10		

Immunity to electromagnetic interference

Electromagnetic compatibility			Immunity NF EN 61000-6-2 / IEC 61000-6-2 Emission NF EN 61000-6-4 NF EN61000-6-3, IEC 61000-6-4, IEC 61000-6-3		

Measurement circuit and input characteristics

Measurement range	Low temperature	**°F (°C)**	30, 33, 37, 41, 44, 48, 51 (- 1, 1, 3, 5, 7, 9, 11)		
	High temperature	**°F (°C)**	93, 96, 100, 104, 107, 111, 114 (34, 36, 38, 40, 42, 44, 46)		
Temperature sensor			PT 100 - 3-wire		
Phase measurement range		**V**	–	–	208–480, - 15 %/+ 10 %
Frequency of the measured signal		**Hz**	–	–	50–60 ± 1
Detection of phase failure with regeneration			–	–	> 30 % of the average of the 3 phases
Input resistance	Temperature	Ω	1330		
	3-phase	**kΩ**	–	–	600
Setting accuracy		**°C**	± 2		
Maximum length of PT100 probe cables		**m**	10		

Time delay characteristics

Relay type			RM35ATL0MW	RM35ATR5MW	RM35ATW5MW
Time delay on crossing the threshold		s	0.1–10, 0 + 10 %		
Reset time		s	8		
Maximum response time	In case of 3-phase fault	ms	–	–	500
	In case of temperature fault	s	3.5 + Tt	3.5 + Tt	3.5 + Tt
	On disappearance of fault	s	3.5	3.5	0.5
Delay on pick-up		ms	200	200	200

Output characteristics

Output type			1 C/O contact	2 N.O. contacts	2 N.O. contacts
Contact type			Cadmium-free		
Current rating—Resistive (Inductive)		A	5 (1 A at 24 Vdc, 5 A at 24 Vac, 3 A at 250 Vac)		
Maximum switching voltage		Vac/Vdc	250		
Rated breaking capacity		VA	1250		
Minimum breaking current		mA	10/5 Vdc		
Electrical durability			1 x 10^5 operating cycles		
Mechanical durability			30 x 10^6 operating cycles		
Maximum operating rate			360 operations/hour under full load		
Utilization categories	Conforming to IEC 60947-5-1		AC-12, AC-13, AC-14, AC-15, DC-12, DC-13, DC-14		

▲ The expected life expressed above is based on average usage and normal operating conditions. Actual operating life will vary with conditions. The above statements are not intended to nor shall they create any expressed or implied warranties as to product operation or life. For information on the listed warranty offered on this product, refer to the Square D Conditions of sale found in the Digest.

Catalog numbers

RM35ATL0MW

RM35ATR5MW

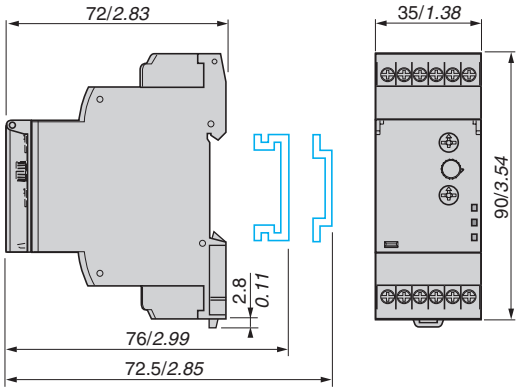
RM35ATW5MW

Function	Supply Vac/Vdc	3-phase control Vac	Output	Catalog numbers	Weight lb(kg)
• Overtemperature 93 to 114 °F (34 to 46 °C) • Under-temperature 30 to 51 °F (- 1 to11 °C)	24–240	–	1 C/O 5 A	**RM35ATL0MW**	0.286 (0.130)
		–	2 N.O. 5 A	**RM35ATR5MW**	0.286 (0.130)
• Overtemperature 93 to 114 °F (34 to 46 °C) • Under-temperature 30 to 51 °F (- 1 to 11 °C) • Phase sequence • Phase failure	24–240	208–480	2 N.O. 5 A	**RM35ATW5MW**	0.286 (0.130)

Temperature control relays RM35AT for elevator machine rooms and 3-phase supplies

Approximate dimensions

RM35AT●●MW



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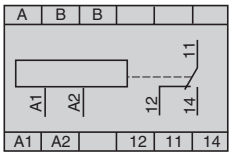
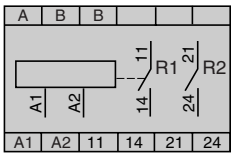
Wiring diagrams

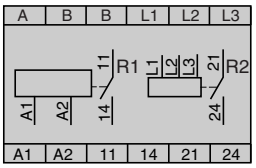
RM35ATL0MW



RM35ATR5MW



RM35ATW5MW



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