

# Zelio Control-modular measurement and control relays

## 3-phase supply and motor temperature control relays RM35 TM



RM35 TM●●●MW

### Presentation

Motor temperature measurement and control relays RM35 TM50MW and RM35 TM250MW 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:  $\sim$  208... 480 V. 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 a LED.

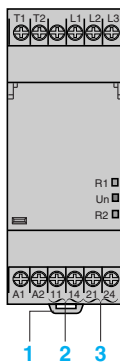
The relays are designed for clip-on mounting on 35 mm rail.

### Applications

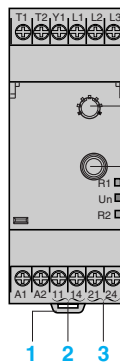
- Control for connection of moving equipment (site equipment, agricultural equipment, refrigerated trucks).
- Control for protection of persons and equipment against the consequences of reverse running (lifting, handling, elevators, escalators, etc.).
- Control of sensitive 3-phase supplies.
- Protection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

### Description

#### RM35 TM50MW



#### RM35 TM250MW



- 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).
- 5 Pushbutton (activation of temperature control) **Test/Reset**

**R1** Yellow LED: temperature relay state indicator.

**Un** Green LED: power ON indicator.

**R2** Yellow LED: phase relay state indicator.

### Operating principle

Relays RM35 TM50MW and RM35 TM250MW 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 in the case of regeneration (asymmetry greater than 30 % of the average of the three phases).

### Phase and temperature control relays: RM35 TM50MW and RM35 TM250MW

#### ■ 3-phase supply control

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

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 open 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 open 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.

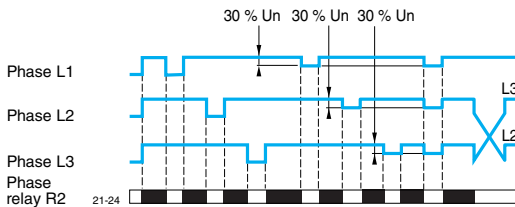
Total short-circuiting of the temperature probe(s), detected when resistance is less than 15 Ω ± 5 Ω, is treated as a fault.

LED R1 is lit when the temperature is correct.

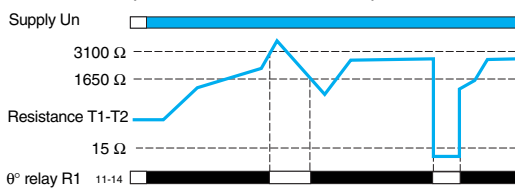
### Function diagrams

#### ■ Function:

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



#### □ Motor temperature control via PTC probe



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### Phase and temperature control relay (with or without memory): RM35 TM250MW

#### Configuration

The configuration is taken into account when relay RM35 TM250MW is energised.

Selection of operating mode:

Set the switch to the required operating mode:

- Temperature control without memory,
- Temperature control with memory.

On energisation, 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.

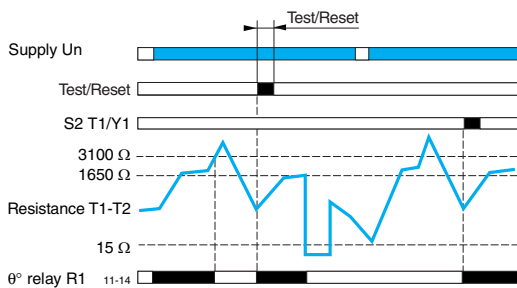
The position of the mode selector switch is taken into account on energisation.

Any modification of its position during operation has no effect: the active configuration may therefore be different from that indicated by the switch; the RM35 TM250MW operates normally but the fact that the configuration has been changed is signalled by simultaneous flashing of the three LEDs.

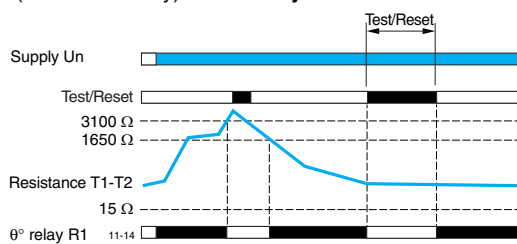
#### Function diagrams

##### ■ Function:

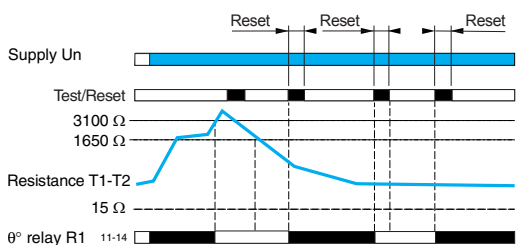
- Motor temperature control via PTC probe (with memory) **Memory.**



- Use of the "Test/Reset" button (without memory) **No Memory.**



- (with memory) **Memory.**



##### ■ Memory

Relay version RM35 TM250MW 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 RM35 TM250MW can also be reset by switching the power off then on (see reset time).

##### ■ Use of the "Test/Reset" button

Relay version RM35 TM250MW 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 is open and the "no fault" LED is 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 has been detected and the temperature has returned to normal, the "temperature" control relay can be unlocked (reset) by pressing the "Test/Reset" button.

Environment characteristics			
<b>Conforming to standards</b>			NF EN 60255-6, IEC 60255-6 and IEC 60034-11-2
<b>Product certifications</b>	Pending		UL, CSA, GL, C-Tick, GOST
<b>Marking</b>			CE: 73/23/EEC and EMC 89/336/EEC
<b>Ambient air temperature</b> around the device	Storage	°C	- 40...+ 70
	Operation	°C	- 20...+ 50
<b>Permissible relative humidity</b>	Conforming to IEC 60068-2-30		2 x 24 hours...+ 95 % RH at + 55 °C (without condensation)
<b>Vibration resistance</b>	Conforming to IEC 60068-2-6		0.035 mm from 10...150 Hz
<b>Shock resistance</b>	Conforming to IEC 60068-2-6		5 gn
<b>Degree of protection</b> Conforming to IEC 60529	Casing		IP 30
	Terminals		IP 20
<b>Degree of pollution</b>	Conforming to IEC 60664-1		3
<b>Overvoltage category</b>	Conforming to IEC 60664-1		III
<b>Insulation resistance</b>	Conforming to 60664-1/60255-5		> 500 MΩ, = 500 V
<b>Rated insulation voltage</b>	Conforming to IEC 60664-1	V	400
<b>Insulation test voltage</b>	Dielectric test	kV	2, ~ 50 Hz, 1 min.
	Shock wave	kV	4 (1.2/50 μs)
<b>Mounting position</b> without derating	In relation to normal vertical mounting plane		Any position
<b>Connection</b> Maximum c.s.a. Conforming to IEC3 60947-1	Solid cable without cable end	mm <sup>2</sup>	1 conductor: 0.5...4 (AWG 20...AWG 11) 2 conductors: 0.5...2.5 (AWG 20...AWG 14)
	Flexible cable with cable end	mm <sup>2</sup>	1 conductor: 0.2...2.5 (AWG 24...AWG 12) 2 conductors: 0.2...1.5 (AWG 24...AWG 16)
<b>Tightening torque</b>	Conforming to IEC 60947-1		0.6...1 N.m / 5.3...8.8 Lbf.In
<b>Housing material</b>			Self-extinguishing plastic
<b>Power ON indicator</b>			Green LED
<b>Relay state indicators</b>	R1 (temperature)		Yellow LED (flashes during the time delay on crossing the threshold)
	R2 (phase)		Yellow LED
<b>Mounting</b>	Conforming to IEC/EN 60715		On 35 mm rail
Supply characteristics			
<b>Rated supply voltage Un</b>		V	~ 24...240
<b>Operating range</b>		V	~ 20.4...264
<b>Frequency</b>	Of the power supply circuit		50/60 Hz ± 10 %
<b>Galvanic isolation, supply/measurement</b>			No (current limitation)
<b>Maximum power consumption</b>		VA	~ 4 VA / = 0.5 W
<b>Immunity to microbreaks</b>			20 ms at 20.4 V
Immunity to electromagnetic interference			
<b>Electromagnetic compatibility</b>			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			
<b>Measurement range</b>		V	~ 208...480
<b>Operating range</b>		V	~ 176...528
<b>Frequency of the measured signal</b>			50...60 Hz ± 10 %
<b>Input resistance</b>		kΩ	602/line

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## Output characteristics

Type of output			2 N/O contacts
Contact type			Cadmium-free
Maximum switching voltage	V		$\sim/\text{---}$ 250
Rated breaking capacity	VA		1250
Minimum breaking current	mA		10/ --- 5 V
Maximum breaking current	A		$\sim/\text{---}$ 5
Electrical durability			1 x 10 <sup>4</sup> operating cycles
Mechanical durability			30 x 10 <sup>6</sup> operating cycles
Maximum operating rate			360 operations/hour under full load
Utilisation 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 min.
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 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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3-phase supply and motor temperature control relays RM35 TM

## References



RM35 TM50MW



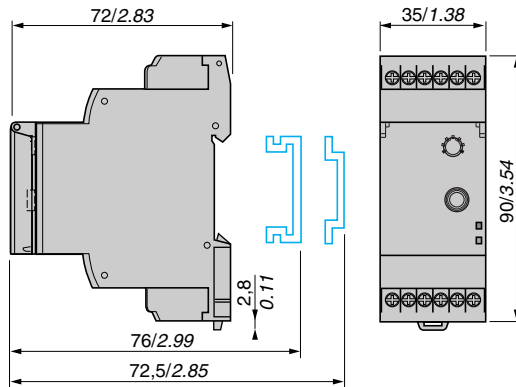
RM35 TM250MW

Function	Supply voltage	Rated 3-phase supply voltage	Output	Reference	Weight
	V	V			kg
<ul style="list-style-type: none"> <li>■ Phase sequence</li> <li>■ Phase failure</li> <li>■ Motor temperature via PTC probe</li> </ul>	~ 24...240	~ 208...480	2 N/O 5 A	<b>RM35 TM50MW</b>	0.120

<ul style="list-style-type: none"> <li>■ Phase sequence</li> <li>■ Phase failure</li> <li>■ Motor temperature via PTC probe</li> <li>■ Selection (with or without memory)</li> <li>■ "Test/Reset" button</li> </ul>	~ 24...240	~ 208...480	2 N/O 5 A	<b>RM35 TM250MW</b>	0.120
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## Dimensions

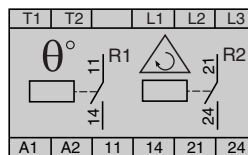
RM35 TM●●MW



mm/in.

## Scheme

RM35 TM●●MW



# Zelio Control-modular measurement and control relays

3-phase and single-phase pump control relays  
RM35 BA



RM35 BA10

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## Presentation

Measurement and control relay RM35 BA10 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:

- $\sim$  208... 480 V in 3-phase mode,
- $\sim$  230 V 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 a LED.

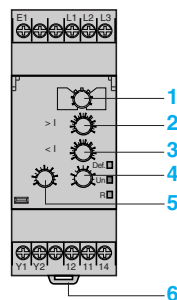
The relay is designed for clip-on mounting on  $\tau$  rail

## Applications

- Management of pumps.

## Description

### RM35 BA



- 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  $\tau$  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 RM35 BA10 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, etc...

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 energisation.

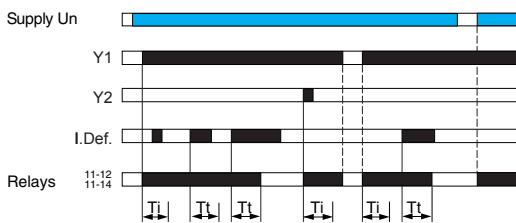
If the switch position is changed while the device is operating, all the LEDs flash, but the product continues to operate normally with the function selected at the time of energisation preceding the change of position.

The LED's return to their normal state if the switch is returned to the original position selected prior to the last energisation.

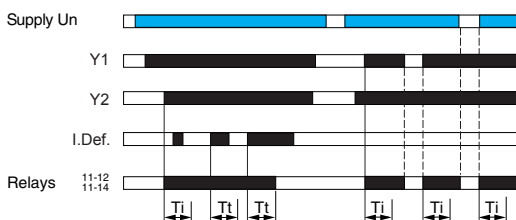
### Function diagrams

■ Functions :

- Single control mode (3ph/1ph).



- 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)

### 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.

### 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).

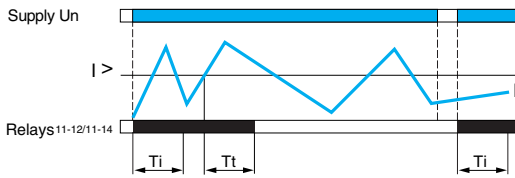
It will open as soon as one of these signals disappears.



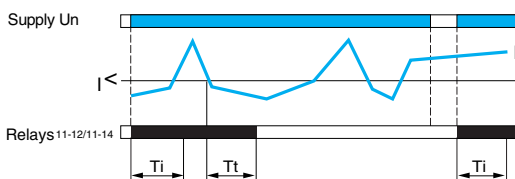
### Function diagrams

■ 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).

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

■ Control

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 energisation, if there is a phase sequence or phase failure fault, the output is unable to energise.

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 is open 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-energised 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 energisation (Ti) allows detection of current peaks on starting of the motor.

### Environment characteristics

<b>Conforming to standards</b>			NF EN 60255-6 and IEC 60255-6
<b>Product certifications</b>	Pending		UL, CSA, GL, C-Tick, GOST
<b>Marking</b>			CE: 73/23/EEC and EMC 89/336/EEC
<b>Ambient air temperature</b> around the device	Storage	°C	- 40...+ 70
	Operation	°C	- 20...+ 50
<b>Permissible relative humidity</b>	Conforming to IEC 60068-2-30		2 x 24 hours...+ 95 % RH at + 55 °C (without condensation)
<b>Vibration resistance</b>	Conforming to IEC 60068-2-6		0.035 mm from 10...150 Hz
<b>Shock resistance</b>	Conforming to IEC 60068-2-27		5 gn
<b>Degree of protection</b> Conforming to IEC 60529	Casing		IP 30
	Terminals		IP 20
<b>Degree of pollution</b>	Conforming to IEC 60664-1		3
<b>Overvoltage category</b>	Conforming to IEC 60664-1		III
<b>Insulation resistance</b>	Conforming to 60664-1/60255-5		> 500 MΩ, ~ 500 V
<b>Rated insulation voltage</b>	Conforming to IEC 60664-1	V	400
<b>Insulation test voltage</b>	Dielectric test	kV	2, ~ 50 Hz, 1 min.
	Shock wave	kV	4
<b>Mounting position</b> without derating	In relation to normal vertical mounting plane		Any position
<b>Connection</b> Maximum c.s.a. Conforming to IEC3 60947-1	Solid cable without cable end	mm <sup>2</sup>	1 conductor: 0.5...4 (AWG 20...AWG 11) 2 conductors: 0.5...2.5 (AWG 20...AWG 14)
	Flexible cable with cable end	mm <sup>2</sup>	1 conductor: 0.2...2.5 (AWG 24...AWG 12) 2 conductors: 0.2...1.5 (AWG 24...AWG 16)
<b>Tightening torque</b>	Conforming to IEC 60947-1		0.6...1 N.m / 5.3...8.8 lbf.in
<b>Housing material</b>			Self-extinguishing plastic
<b>Power ON indicator</b>			Green LED
<b>Relay state indicator</b>			Yellow LED
<b>Fault indication</b>			Yellow LED
<b>Mounting</b>	Conforming to IEC/EN 60715		On 35 mm rail

### Supply characteristics

<b>Rated supply voltage Un</b>	3-phase	V	~ 208...480
	Single-phase	V	~ 230
<b>Operating range</b>		V	~ 183...528
<b>Voltage limits</b>	Of the power supply circuit		- 15 %, + 10 %
<b>Frequency</b>	Of the power supply circuit		50/60 Hz ± 10 %
<b>Galvanic isolation, supply/measurement</b>			No
<b>Maximum power consumption</b>		VA	~ 5
<b>Immunity to microbreaks</b>		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	$\sim 1...10$
Input resistance	$\Omega$	E1 - L2 : 0.01
Overload	Permanent at 25 °C	A 11 (E1-L2)
	Non repetitive < 1 s at 25 °C	A 50 (E1-L2)
Frequency of the measured signal	Hz	50...60 $\pm$ 10 %
Maximum measuring cycle	ms	140/measurement as true rms value
Hysteresis		5 % of the threshold
Setting accuracy		$\pm$ 10 % of the threshold setting (of the full scale value)
Repeat accuracy (with constant parameters)		$\pm$ 1 %
Measurement error with voltage variation		1 % / V over the whole range
Measurement error with temperature variation		$\pm$ 0.05 % / °C
Time delay characteristics		
Time delay on energisation T <sub>i</sub>	s	1...60. 0 + 10 %
Time delay on crossing the threshold T <sub>t</sub>	s	0.1...10. 0 + 10 %
Repeat accuracy (with constant parameters)		$\pm$ 1 %
Reset time	s	2
Minimum duration Y <sub>2</sub> (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	V	$\sim/\overline{=}$ 250
Rated breaking capacity	VA	1250
Maximum breaking current	A	$\sim/\overline{=}$ 5
Minimum breaking current		10 mA $\overline{=}$ 5 V
Mechanical durability		30 x 10 <sup>6</sup> operating cycles
Electrical durability		1 x 10 <sup>5</sup> operating cycles
Maximum operating rate		360 operations/hour under full load
Utilisation categories	Conforming to IEC 60947-5-1	AC-12, AC-13, AC-14, AC-15, DC-12, DC-13

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3-phase and single-phase pump control relays  
RM35 BA

## Reference

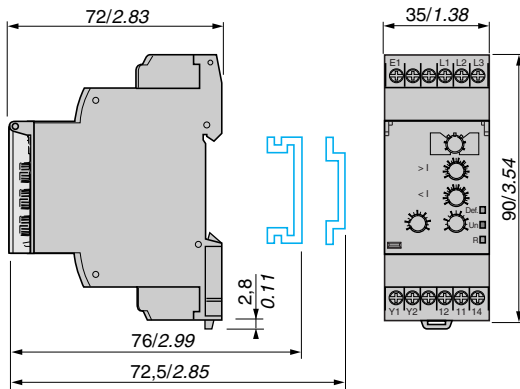


RM35 BA10

Function	Current range controlled	Supply voltage	Output	Reference	Weight
	A	V			
<b>3-phase:</b> <ul style="list-style-type: none"> <li>Phase sequence</li> <li>Phase failure</li> <li>Overcurrent and undercurrent control</li> </ul> <b>Single-phase :</b> <ul style="list-style-type: none"> <li>Overcurrent and undercurrent control</li> </ul>	1...10	<ul style="list-style-type: none"> <li>~ 208...480, 3-phase</li> <li>~ 230, single-phase</li> </ul>	1 C/O 5 A	<b>RM35 BA10</b>	0.110 kg

## Dimensions

RM35 BA10

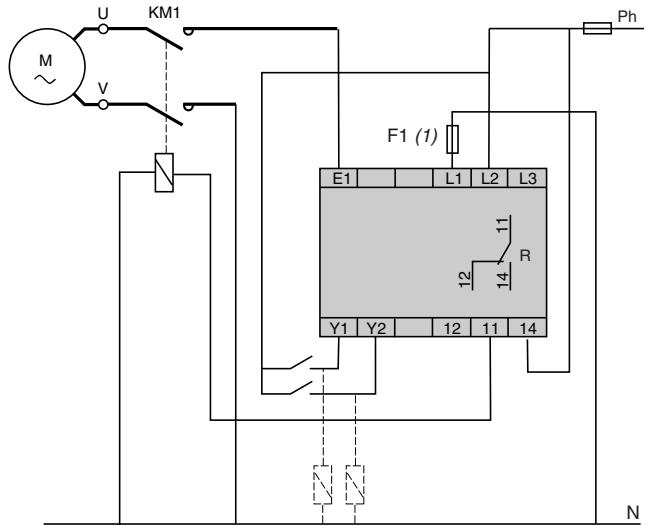
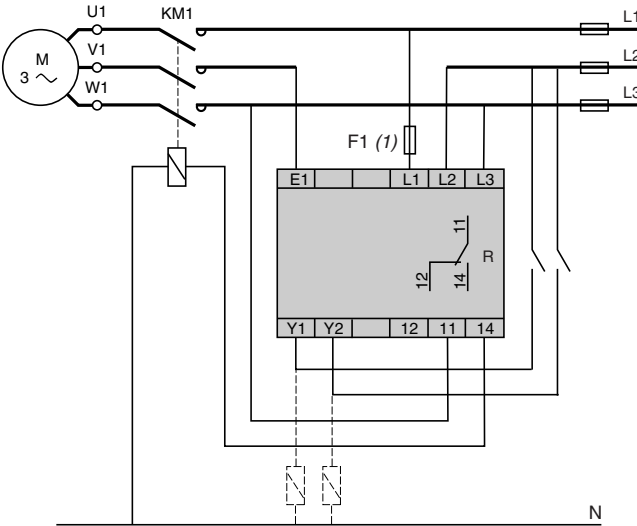


mm/in.

### Schemes RM35 BA10

3-phase < 10 A

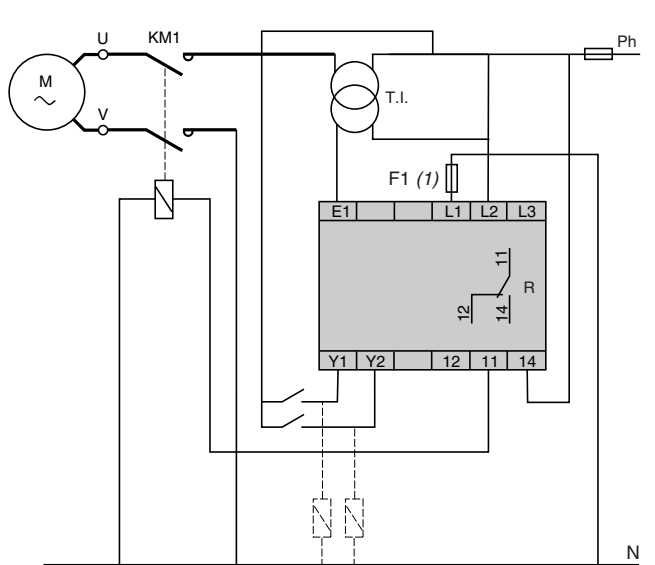
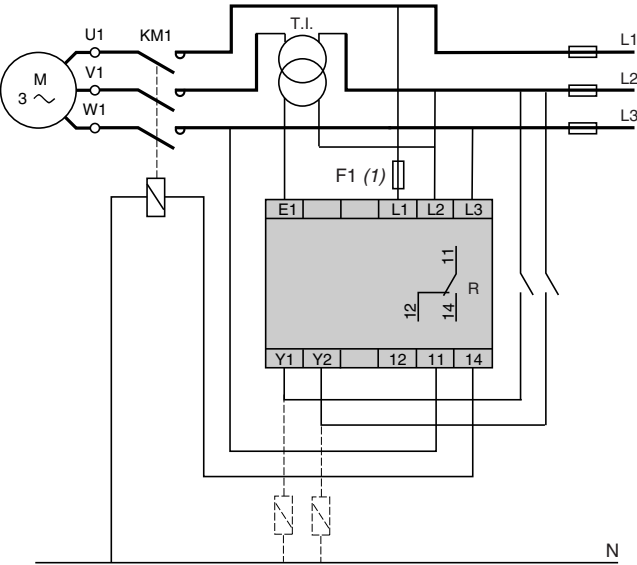
Single-phase ~ 230 V < 10 A



(1) 100 mA quick-blow fuse or circuit-breaker.

3-phase > 10 A

Single-phase ~ 230 V > 10 A



(1) 100 mA quick-blow fuse or circuit-breaker.

# Zelio Control-modular measurement and control relays

Temperature control relays RM35 AT● for elevator machine rooms and 3-phase supplies



RM35 AT●0MW

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## Presentation

Measurement and control relays RM35 ATL0MW, RM35 ATR5MW and RM35 ATW5MW are designed for monitoring the temperature in elevator machine rooms, in compliance with directive EN81.

- PT 100 input,
- Adjustable control around 5 °C and 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 a LED.

The relays are designed for clip-on mounting on 35 mm rail.

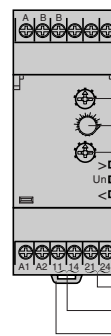
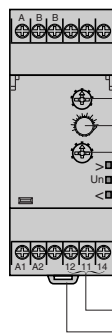
## Applications

- Temperature control for elevator machine rooms.

## Description

### RM35 ATL0MW

### RM35 ATR5MW



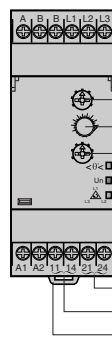
- 1 High temperature threshold setting potentiometer.  $\theta^>$
- 2 Potentiometer for adjustment of time delay on crossing of temperature threshold. **Tt**
- 3 Low temperature threshold setting potentiometer.  $\theta^<$
- 4 Spring for clip-on mounting on 35 mm rail.
- 5 High temperature threshold 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).

### RM35 ATW5MW



- 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).

< $\theta^<$ > Yellow LED: indicates temperature relay output state. **R1**

Un Green LED: indicates that supply to the relay is on.

$L_1$   
 $L_2$   
 $L_3$  Yellow LED: indicates phase relay output state. **R2**

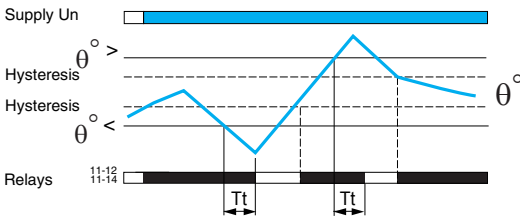
# Zelio Control-modular measurement and control relays

## Temperature control relays RM35 AT● for elevator machine rooms and 3-phase supplies

**Function diagram**

■ Function:

- Temperature control by PT 100 probe.



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

**Operating principle**

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

**Temperature control relay: RM35 ATL0MW**

After a delay on pick-up after energisation, 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.

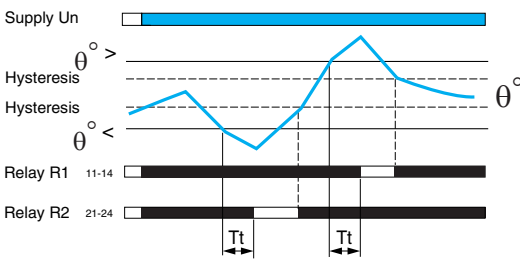
The output relay closes instantly (within the response time on disappearance of a fault) when the temperature returns within the window of the two threshold settings on the front panel, plus the fixed hysteresis.

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: RM35 ATR5MW**

After a delay on pick-up after energisation, 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.

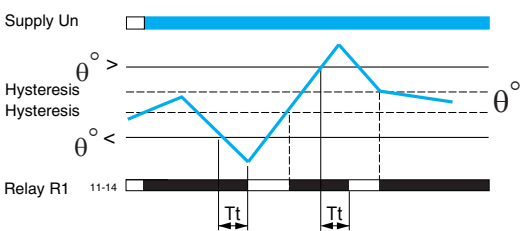
The output relay closes instantly (response time on disappearance of a fault) when the temperature returns within the window of the two threshold settings on the front panel, plus (or minus) the fixed hysteresis.

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: RM35 ATW5MW**

After a delay on pick-up after energisation, 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 energisation, 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.

# Zelio Control -modular measurement and control relays

Temperature control relays RM35 AT● for elevator machine rooms and 3-phase supplies

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Environment characteristics				
Relay type		RM35 ATL0MW	RM35 ATR5MW	RM35 ATW5MW
<b>Conforming to standards</b>		NF EN 60255-6 and IEC 60255-6		
<b>Product certifications</b>	Pending	UL, CSA, GL, C-Tick, GOST		
<b>Marking</b>		CE: 73/23/EEC and EMC 89/336/EEC		
<b>Ambient air temperature</b> around the device	Storage	°C	- 40...+ 70	
	Operation	°C	- 20...+ 50	
<b>Permissible relative humidity</b>	Conforming to IEC 60068-2-30	2 x 24 hours...+ 95 % RH at + 55 °C (without condensation)		
<b>Vibration resistance</b>	Conforming to IEC 60068-2-6	0.035 mm from 10...150 Hz		
<b>Shock resistance</b>	Conforming to IEC 60068-2-6	5 gn		
<b>Degree of protection</b> Conforming to IEC 60529	Casing	IP 30		
	Terminals	IP 20		
<b>Degree of pollution</b>	Conforming to IEC 60664-1	3		
<b>Overvoltage category</b>	Conforming to IEC 60664-1	III		
<b>Insulation resistance</b>	Conforming to 60664-1/60255-5	> 100 MΩ, --- 500 V		
<b>Rated insulation voltage</b>	Conforming to IEC 60664-1	V	250	250
<b>Insulation test voltage</b>	Dielectric test	kV	2, ~ 50 Hz, 1 min.	
	Shock wave	kV	4	
<b>Mounting position</b> without derating	In relation to normal vertical mounting plane	Any position		
<b>Connection</b> Maximum c.s.a. Conforming to IEC 60947-1	Solid cable without cable end	mm <sup>2</sup>	1 conductor: 0.5...4 (AWG 20...AWG 11) 2 conductors: 0.5...2.5 (AWG 20...AWG 14)	
	Flexible cable with cable end	mm <sup>2</sup>	1 conductor: 0.2...2.5 (AWG 24...AWG 12) 2 conductors: 0.2...1.5 (AWG 24...AWG 16)	
<b>Tightening torque</b>	Conforming to IEC 60947-1	0.6...1 N.m / 5.3...8.8 Lbf.In		
<b>Housing material</b>		Self-extinguishing plastic		
<b>Power ON indicator</b>		Green LED	Green LED	Green LED
<b>Relay state indicator</b>	High threshold	Yellow LED	Yellow LED	–
	Low threshold	Yellow LED	Yellow LED	–
	High threshold/low threshold	–	–	Yellow LED
	Phases	–	–	Yellow LED
<b>Mounting</b>	Conforming to IEC/EN 60715	On 35 mm $\square$ rail		

Supply characteristics				
Relay type		RM35 ATL0MW	RM35 ATR5MW	RM35 ATW5MW
<b>Rated supply voltage Un</b>		V	~/--- 24...240	
<b>Operating range</b>		V	~/ 20.4...264 --- 21.6...264	
<b>Voltage limits</b>	Of the power supply circuit		~/ - 15 %, + 10 % --- - 10 %, + 10 %	
<b>Frequency</b>	Of the power supply circuit	Hz	50/60 Hz ± 10 %	
<b>Galvanic isolation, supply/measurement</b>			Yes	No
<b>Maximum power consumption at Un</b>		VA	~/ 3.5	
		W	--- 0.6	
<b>Immunity to microbreaks</b>		ms	10	

Immunity to electromagnetic interference	
<b>Electromagnetic compatibility</b>	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			
<b>Measurement range</b>	Low temperature	°C	- 1, 1, 3, 5, 7, 9, 11
	High temperature	°C	34, 36, 38, 40, 42, 44, 46
<b>Temperature sensor</b>			PT 100 - 3-wire
<b>Phase measurement range</b>		V	–
<b>Frequency of the measured signal</b>		Hz	–
<b>Detection of phase failure with regeneration</b>			–
			> 30 % of the average of the 3 phases
<b>Input resistance</b>	Temperature	Ω	1330
	3-phase	kΩ	–
<b>Setting accuracy</b>		°C	± 2
<b>Maximum length of PT100 probe cables</b>		m	10

# Zelio Control-modular measurement and control relays

Temperature control relays RM35 AT● for elevator machine rooms and 3-phase supplies

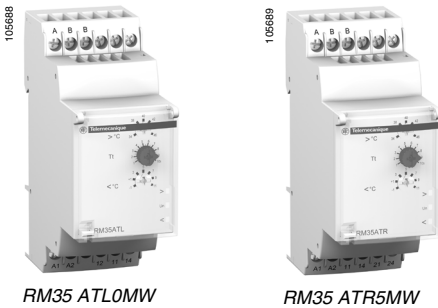
## Time delay characteristics

Relay type		RM35 ATL0MW	RM35 ATR5MW	RM35 ATW5MW
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
	On disappearance of fault	s	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		
Nominal current	A	5		
Maximum switching voltage	V	$\sim/\text{---}$ 250		
Rated breaking capacity	VA	1250		
Minimum breaking current	mA	10/ $\text{---}$ 5 V		
Electrical durability		1 x 10 <sup>5</sup> operating cycles		
Mechanical durability		30 x 10 <sup>6</sup> operating cycles		
Maximum operating rate		360 operations/hour under full load		
Utilisation categories	Conforming to IEC 60947-5-1	AC-12, AC-13, AC-14, AC-15, DC-12, DC-13, DC-14		

## References

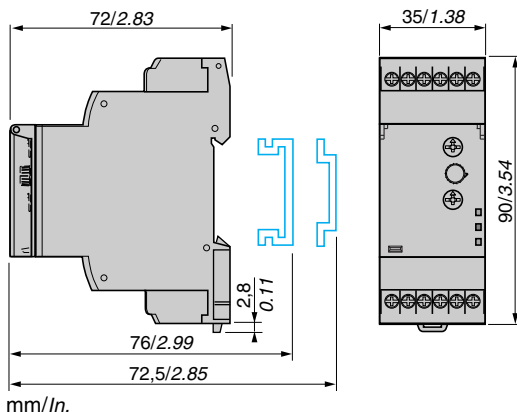


Function	Supply	3-phase control	Output	Reference	Weight
	V	V			kg
<ul style="list-style-type: none"> <li>Overtemperature : <math>\sim/\text{---}</math> 24...240 34...46 °C</li> <li>Under-temperature - 1...11 °C</li> </ul>		–	1 C/O 5 A	RM35 ATL0MW	0.130
		–	2 N/O 5 A	RM35 ATR5MW	0.130
<ul style="list-style-type: none"> <li>Overtemperature : <math>\sim/\text{---}</math> 24...240 34...46 °C</li> <li>Under-temperature - 1...11 °C</li> <li>Phase sequence</li> <li>Phase failure</li> </ul>		$\sim$ 208...480	2 N/O 5 A	RM35 ATW5MW	0.130



## Dimensions

RM35 AT●MW



## Schemes

RM35 ATL0MW

RM35 ATR5MW

RM35 ATW5MW

