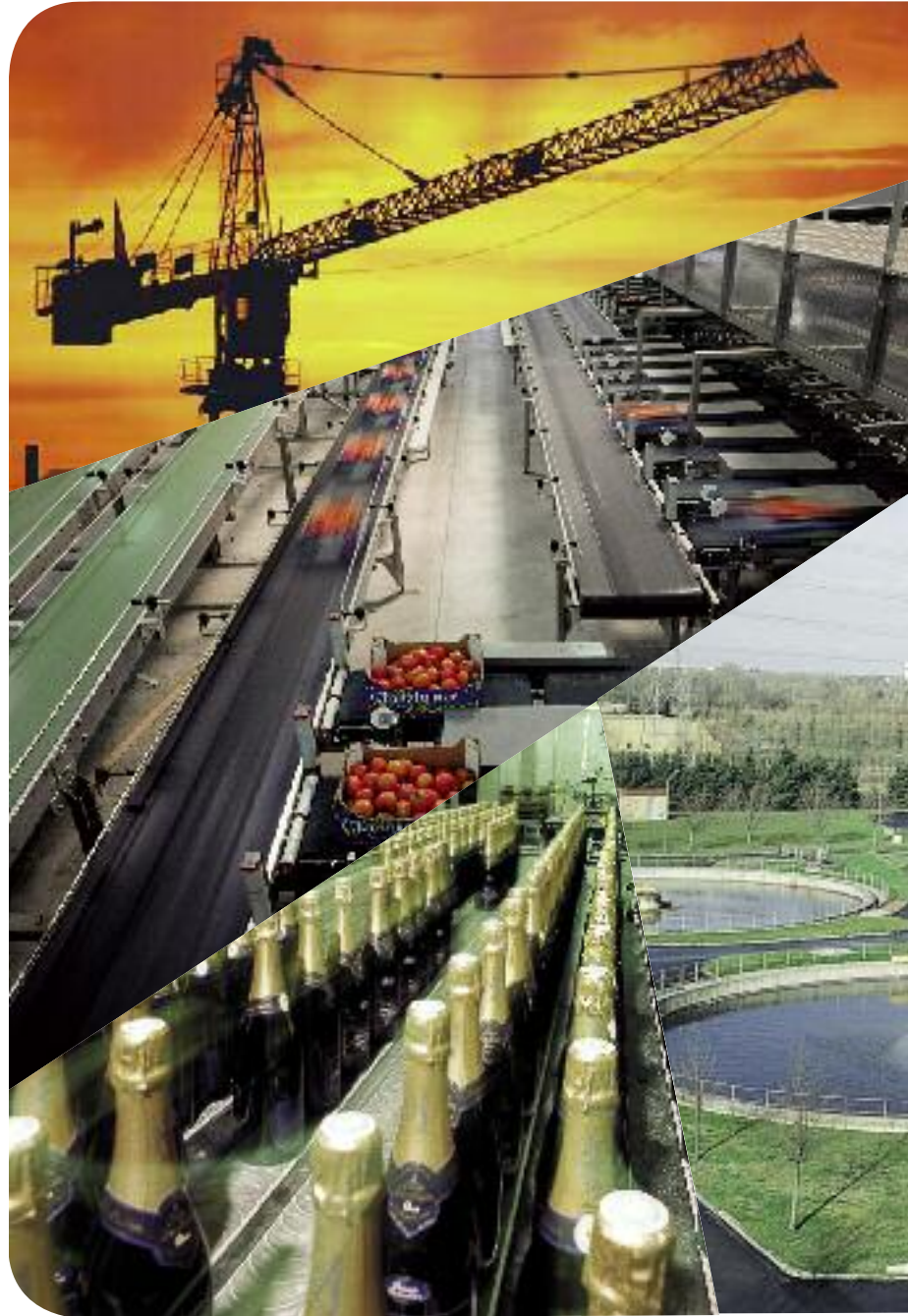


# Measurement and Control Relays

## Zelio Control

*Monitoring* of your equipments



**Telemecanique**

by **Schneider** Electric

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Leveraging  
ingenuity  
and intelligence  
for ease of use

## Measurement and control relays

### Guarantee total availability of your automated systems

Highly-automated process industries cannot run the risk of production line shutdowns. To prevent breakdowns with costly consequences, equipment monitoring is vital. Measurement and control relays monitor and detect abnormal operating conditions. By monitoring energy network states, they enable electrical and mechanical loads control.

Control relays inform users of abnormal conditions, and allow them to initiate the necessary corrective actions before serious and costly breakdowns can occur.

### 8 product families

3-phase network control.  
Current control.  
Voltage control.  
Frequency control.  
Speed control.  
Lift temperature control.  
Level control.  
Pump control.



Adjustable parameters

State indication by LEDs

Lead-sealable cover

### New design

- 2 compact, modular sizes,
- Adapted for industrial and building control panels,
- Lead-sealable settings protection cover,
- State indication by LEDs,
- Optimisation of power supplies.

## ► *Monitor*

Control relays monitor physical and electrical values. They measure variable signals such as: Phase presence, sequence and balance, voltage, current and frequency. They also control liquid levels and process operating rate.

## ► *Inform*

Control device outputs provide users with electrical information. In addition, all setting faults are signalled by simultaneous flashing of all LEDs.

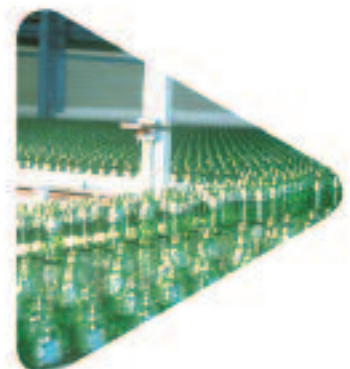
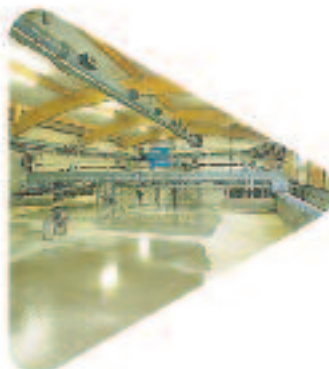
## ► *Protect*

Integrated in the control circuits of your automated systems, they enable automatic shutdown management and provide fault information.

This ensures protection of your equipment.

## ► *Manage*

When the power is switched on, control relays are inhibited to enable correct measurement circuit setting. The outputs operate with positive logic, the contact or contacts being closed under normal conditions and open as soon as fault or power supply loss is detected.





## Phase control relays

### The motor fault prevention solution

Dedicated mainly to processes integrating 3-phase motors, phase control relays enable in-time detection of 3-phase electrical network faults: single-phase operating mode or overheating caused by network faults. They indicate the need for maintenance and/or corrective operations before additional costs are incurred (production shutdown, motor repair or replacement, etc.). They also extend service life of 3-phase motors.

### ▼ Functions

Phase control relays monitor:

- Phase sequence,
- Loss of one or more phases,
- Unbalance level,
- Voltage level between phases or between phases and neutral.

The Zelio control range also offers relays combining several functions.



### ► Characteristics

- Standard dimensions: compact and modular format 17.5 and 35 mm,
- Optimisation of number of references: multivoltage from 3 x 208 to 3 x 480 VAC,
- Coverage of all requirements with mono to multifunction offer,
- Wiring savings, self-powered,
- Combination of phase and motor temperature functions,
- Settings protection thanks to lead-sealable cover,
- Clear display of control state by LEDs,
- True RMS value measurement (even on deformed sinus waves),
- Adjustable time delay.



## ► Applications

- 3-phase motors,
- Moving 3-phase machines and equipment (cranes, truck refrigeration units, etc.),
- Overhead cranes, winches,
- Lifts, goods lifts, escalators, travelators, etc.
- Pumps,
- Fans, air extractors,
- Mining excavators and conveyors.



## Phase control

| Functions                                     | Power supply               | Control values  | Time delay  | Outputs           | References     |
|---|----------------------------|---|-------------|-------------------|----------------|
| Phase loss and sequence                       | Self-powered 208...480 VAC | 208...480 VAC   | -           | 1 C/O relay 5 A   | RM17 TG 00     |
| Phase loss and sequence                       | Self-powered 208...440 VAC | 208...440 VAC   | -           | 2 C/O relays 5 A  | RM17 TG 20     |
| Phase loss (regeneration 70% Un) and sequence | Self-powered 208...480 VAC | 208/220/380/400/415/440/480 VAC   | -           | 1 C/O relay 5 A   | RM17 TT 00     |
| Phase loss and sequence, undervoltage         | Self-powered 208...480 VAC | -2 to -20% Un phase/phase   | 0.1 to 10 s | 1 C/O relay 5 A   | RM17 TU 00     |
| Phase loss and sequence, unbalance            | Self-powered 208...480 VAC | Unbalance 5 to 15%  | 0.1 to 10 s | 1 C/O relay 5 A   | RM17 TA 00     |
| Phase loss and sequence, unbalance            | Self-powered 208...480 VAC | Unbalance 5 to 15%  | 0.1 to 10 s | 1 C/O relay 5 A   | RM17 TE 00     |
| Over/undervoltage difference                  | Self-powered 208...480 VAC | Voltage difference 2 to 20% Un phase/phase  | 0.1 to 10 s | 1 C/O relay 5 A   | RM17 TE 00     |
| Phase loss and sequence, unbalance            | Self-powered 208...480 VAC | Unbalance 5 to 15%  | 0.1 to 10 s | 1 C/O relay 5 A   | RM17 TE 00     |
| Overvoltage                                   | Self-powered 220...480 VAC | Overvoltage 2 to 20% Un phase/phase   | 0.1 to 10 s | 2 C/O relays 5 A* | RM35 TF 30     |
| Undervoltage                                  | Self-powered 220...480 VAC | Undervoltage -20% to -2% Un phase/phase   | 0.1 to 10 s | 2 C/O relays 5 A  | RM35 UB3 30    |
| Over/undervoltage between phases              | Self-powered 220...480 VAC | Overvoltage 2 to 20% Un phase/phase   | 0.3 to 30 s | 2 C/O relays 5 A  | RM35 UB3 30    |
| Over/undervoltage between phases and neutral  | Self-powered 208...480 VAC | Undervoltage -20% to -2% Un phase/phase   | 0.3 to 30 s | 2 C/O relays 5 A  | RM35 UB3N 30   |
| Over/undervoltage between phases              | Self-powered 208...480 VAC | Overvoltage 2 to 20% Un phase/neutral   | 0.3 to 30 s | 2 C/O relays 5 A  | RM35 UB3N 30   |
| Over/undervoltage between phases              | Self-powered 208...480 VAC | Undervoltage -20% to -2% Un phase/neutral   | 0.3 to 30 s | 1 C/O relay 5 A   | RM17 UB3 10    |
| Phase loss and sequence                       | 24...240 VAC/DC 50/60 Hz   | Phases : 208...480 VAC  |             | 2 NO relays 5 A   | RM35 TM 50 MW  |
| PTC thermistor probe thermal protection       | 24...240 VAC/DC 50/60 Hz   | Thermal protection: auto reset  |             | 2 NO relays 5 A   | RM35 TM2 50 MW |
| Phase loss and sequence                       | 24...240 VAC/DC 50/60 Hz   | Phases : 208...480 VAC  |             | 2 NO relays 5 A   | RM35 TM2 50 MW |
| PTC thermistor probe thermal protection       | 24...240 VAC/DC 50/60 Hz   | Thermal protection: selectable fault memorization, front face and remote reset, fault test pushbutton | -           | 2 NO relays 5 A   | RM35 TM2 50 MW |

\* 2 C/O DPDT 5 A



## Voltage control relays

### The power supply fault prevention solution

Voltage control relays monitor input voltage level compared to a high or low threshold preset by the user. In the "window" mode, the relays simply check that the voltage remains within a predetermined high and low level.



### ► Characteristics common to voltage and current relays

- Standard dimensions:  
compact and modular format 17.5 and 35mm,
- Suitable for alternating and direct signals,
- Optimised power supply  
for fewer references to manage,
- Settings protection  
thanks to lead-sealable cover,
- Clear display of control state by LEDs,
- True RMS value measurement  
(even on deformed sine waves),
- Adjustable time delay,
- Selectable fault state memorization.



## Current control relays

### The load fault prevention solution

Dedicated to measurement of under and overcurrent, without external sensors, up to 15A current control relays enable continuous monitoring of the operation of electrical and mechanical loads such as motors and resistors. Simple to install and adjust, these control relays are for applications in fields as varied as ventilation, pumping, and conveying.



## Frequency control relays

### The network frequency fault prevention solution

Frequency control relays monitor positive or negative frequency variation of 50 or 60Hz alternating signals entering their measurement circuits.



#### Characteristics

- Standard dimensions: compact and modular format 17.5 and 35 mm,
- Optimisation of power supplies number: 120 to 260 VAC between phase and neutral,
- Cover all requirements, over and underfrequency,
- Wiring savings, self-powered,
- Suitable for 50 and 60 Hz networks,
- Settings protection thanks to lead-sealable cover,
- Clear display of control state by LEDs,
- Adjustable time delay,
- Selectable fault state memorization.

### Voltage control

| Functions             | Power supply                  | Control values                         | Time delay  | Outputs         | References    |
|-----------------------|-------------------------------|--|-------------|-----------------|---------------|
| Over and undervoltage | Self-powered 12 VDC           | 9 to 15 VDC                            | 0.1 to 10 s | 1 C/O relay 5A  | RM17 UAS 14   |
| Over and undervoltage | Self-powered 20 to 80 VAC/DC  | 20 to 80 VAC/DC                        | 0.1 to 10 s | 1 C/O relay 5A  | RM17 UAS 16   |
| Over and undervoltage | Self-powered 65 to 260 VAC/DC | 65 to 260 VAC/DC                       | 0.1 to 10 s | 1 C/O relay 5A  | RM17 UAS 15   |
| Over and undervoltage | Self-powered 20 to 80 VAC/DC  | 20 to 80 VAC/DC                        | 0.1 to 10 s | 1 C/O relay 5A  | RM17 UBE 16   |
| Over and undervoltage | Self-powered 65 to 260 VAC/DC | 65 to 260 VAC/DC                       | 0.1 to 10 s | 1 C/O relay 5A  | RM17 UBE 15   |
| Over and undervoltage | 24 to 240 VAC/DC 50/60 Hz     | 0.05 V...0.5 V 0.3 V...3 V 0.5 V...5 V | 0.3 to 30 s | 2 C/O relays 5A | RM35 UA 11 MW |
| Over and undervoltage | 24 to 240 VAC/DC 50/60 Hz     | 1 V...10 V 5 V...50 V 10 V...100 V     | 0.3 to 30 s | 2 C/O relays 5A | RM35 UA 12 MW |
| Over and undervoltage | 24 to 240 VAC/DC 50/60 Hz     | 15 V...150 V 30 V...300 V 60 V...600 V | 0.3 to 30 s | 2 C/O relays 5A | RM35 UA 13 MW |

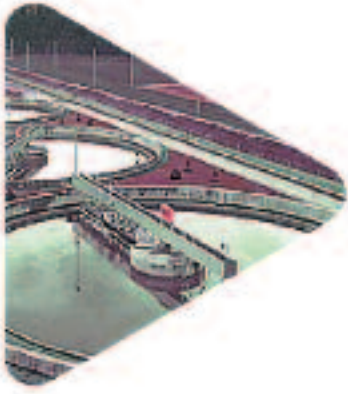
### Current control

| Functions            | Power supply              | Control values                    | Time delay                                      | Outputs           | References    |
|----------------------|---------------------------|-----------------------------------|---|-------------------|---------------|
| Overcurrent          | 24 to 240 VAC/DC 50/60 Hz | 2...20 A by integrated toroid     | -   | 1 C/O relays 5 A  | RM17 JC 00 MW |
| Over or undercurrent | 24 to 240 VAC/DC 50/60 Hz | 2...20 mA 10...100 mA 50...500 mA | Inhibition: 1 to 20 s<br>Threshold: 0.3 to 30 s | 2 C/O relays 5 A* | RM35 JA 31 MW |
| Over or undercurrent | 24 to 240 VAC/DC 50/60 Hz | 0.15...1.5 A 0.5...5 A 1.5...15 A | Inhibition: 1 to 20 s<br>Threshold: 0.3 to 30 s | 2 C/O relays 5 A* | RM35 JA 32 MW |

### Frequency control

| Functions           | Power supply            | Control values   | Time delay  | Outputs          | References    |
|---------------------|-------------------------|--|-------------|------------------|---------------|
| Over/underfrequency | 120 to 277 VAC 50/60 Hz | Network 50 and 60 Hz<br>Upper threshold: -2 to +10 Hz<br>Lower threshold: -10 to +2 Hz | 0.1 to 10 s | 2 C/O relays 5 A | RM35 HZ 21 FM |

\* 2 C/O DPDT 5 A



## Level control relays

### The filling, draining and monitoring solution

Level control relays are used to monitor or maintain levels, mainly of liquids. Level control is usually achieved with float switch fitted contacts which change state according to the position of the float switch. Due to the relatively low currents going through these types of probes, their reliability is questionable.

This is particularly true in polluted environments and when there are shocks and vibration.

To properly respond to the requirements of level control, the Zelio Control range offers relays that monitor by measuring liquid resistivity, this operating principle eliminates the problems encountered with contact probes.

These monitoring relays enable adjustment of measurement sensitivity so as to precisely set closing and tripping levels. In addition, a selectable time delay takes wave effect into account, avoiding unwanted closing and tripping due to movements of liquid.

Dedicated to non-conductive materials, relay with digital inputs from sensors allows to achieve level control also comes into the offer.



### ► Characteristics

- Standard dimensions:  
compact and modular format 35 mm,
- Optimisation of number of references:  
single voltage 24 to 240 VAC/DC,
- Offer covering all applications:  
conducting liquids and other materials,
- Drain or fill modes,
- Settings protection thanks to lead-sealable cover,
- Clear display of control state by LEDs,
- Adjustable time delay.





## Pump control relays

### The pump management and monitoring solution

- Standard dimensions:  
compact and modular format 35 mm,
- Optimisation of number of references:  
multivoltage from 3 x 208 to 3 x 480 VAC,
- Over/undercurrent control 0.1 to 10 A,
- Wiring savings: self-powered,
- Combined functions:  
phase, current and discrete inputs,
- Settings protection  
thanks to lead-sealable cover,
- Clear display of control state by LEDs,
- Phase loss and sequence monitoring,
- Choice of single or 3-phase modes,
- Time delay adjustable up to 60 s.



Pump control relays control pumps (single or 3-phase) using discrete control inputs and monitor current (dry operation and overload protection) and the state of supply phases.



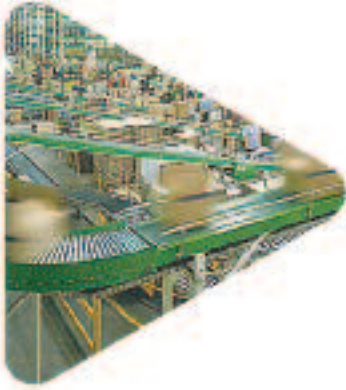
### Level control

| Functions                            | Power supply              | Control values  | Time delay  | Outputs          | References    |
|--------------------------------------|---------------------------|---|-------------|------------------|---------------|
| Drain or fill                        | 24 to 240 VAC/DC 50/60 Hz | 0.25...5 K $\Omega$ 5...100 K $\Omega$ 0.05...1 M $\Omega$            | 0.1 to 10 s | 2 C/O relay 5 A* | RM35 LM 33 MW |
| Drain or fill                        | 24 to 240 VAC/DC 50/60 Hz | Sensor discrete input: contact/positive switching/negative switching/ | 0.1 to 5 s  | 1 C/O relay 5 A  | RM35 LV 14 MW |
| Suspended probe 1 electrode + 1 ref. |                           |   |             |                  | LA9 RM 201    |
| Suspended protected probe            |                           |   |             |                  | RM79 696 043  |

### Pump control

| Functions                           | Power supply               | Control values                 | Time delay | Outputs         | References |
|-------------------------------------|----------------------------|--------------------------------|------------|-----------------|------------|
| Single or 3-phase operation         |                            |                                |            |                 |            |
| Over/undercurrent                   | Self-powered 208...480 VAC | Over/undercurrent: 0.1 to 10 A | 1 to 60 s  | 1 C/O relay 5 A | RM35 BA 10 |
| Phase loss and sequence in 3-phase  | 230 VAC 50/60 Hz           | Phase: 208...480 V C           |            |                 |            |
| 2 contact inputs for cycle commands |                            |                                |            |                 |            |

\* 2 C/O DPDT 5 A



## Speed control relays

### The operating rate monitoring solution

Speed control relays can receive pulses from all types of sensors such as:

- Inductive sensors on gear wheels,
- Photoelectric sensors on conveyors,
- Microswitches on cams.

Dependent on rotation or movement speed, the pulse rate supplied to the relay varies. By monitoring the pulse rate, the relays control over or underspeed. The applications include monitoring of rotation speed, transporter or conveyor belt speed, pump rotation, etc.

### ► Characteristics

- Standard dimensions:  
compact and modular format 35 mm,
- Optimisation of number of references:  
single voltage 24 to 240 VAC/DC,
- Automatic sensor type detection,
- Removable inhibition by external contact,
- Fault memory function,
- Settings protection thanks to lead-sealable cover,
- Clear display of control state by LEDs,
- Reset by remote contacts  
and power supply cuts,
- Inhibition time delay at power-on.





## Temperature control relays

### *Lifts application*

The temperature control solution conforming to EN81

Temperature control relays monitor the temperature in control or pulley rooms to check that it remains within the regulated limits. A combined temperature and phase control version of the relay is available.



## Speed control

| Functions             | Power supply              | Control values  | Time delay  | Outputs         | References  |
|-----------------------|---------------------------|---|-------------|-----------------|-------------|
| Over/under rate/speed | 24 to 240 VAC/DC 50/60 Hz | Interval between control pulses:<br>0.05 to 0.5 s 0.1 to 1 s 0.5 to 5 s 1 to 10 s<br>0.1 to 1 mn 0.5 to 5 mn 1 to 10 mn | 0.6 to 60 s | 1 C/O relay 5 A | RM35 S 0 MW |

## Temperature control

| Functions   | Power supply              | Control values   | Time delay | Outputs         | References    |
|---|---------------------------|--|------------|-----------------|---------------|
| Control room temperature  | 24 to 240 VAC/DC 50/60 Hz | Input PT100 3-wire<br>Lower threshold: -1°C to +11°C<br>Upper threshold: +34°C to +46°C                        | 1 to 10 s  | 1 C/O relay 5 A | RM35 ATL 0 MW |
| Control room temperature  | 24 to 240 VAC/DC 50/60 Hz | Input PT100 3-wire<br>Lower threshold: -1°C to +11°C<br>Upper threshold: +34°C to +46°C                        | 1 to 10 s  | 2 NO relays 5 A | RM35 ATR 5 MW |
| Control room temperature<br>Phase loss (regeneration 70 % Un)<br>and sequence | 24 to 240 VAC/DC 50/60 Hz | Inputs: 208...480 V<br>Input PT100 3-wire<br>Lower threshold: -1°C to +11°C<br>Upper threshold: +34°C to +46°C | 1 to 10 s  | 2 NO relays 5 A | RM35 ATW 5 MW |



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