

Measurement and control relays

**Zelio Control**

*Monitoring*

of your equipments



## Simply Smart!

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



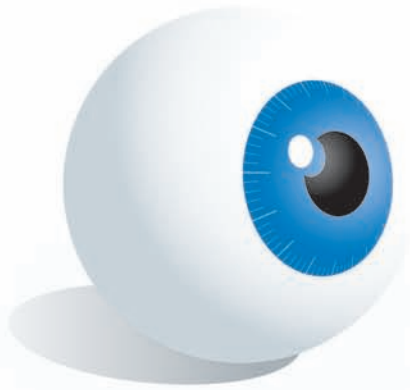
State indication by LEDs



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.

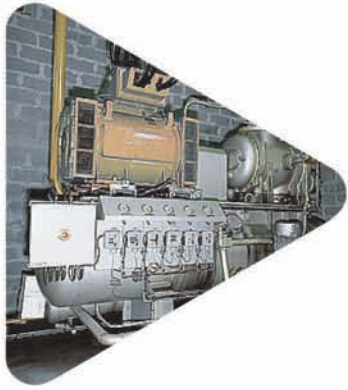
## ▶ *Protect*

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

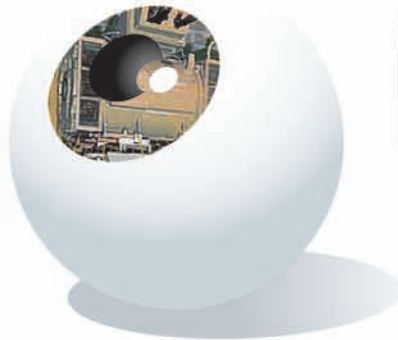
Dedicated mainly to processes integrating 3-phase motors, phase control relays enable in-time detection of 3-phase electrical network faults: single-phase operating mode or overheating caused by network faults. They indicate the need for maintenance and/or corrective operations before additional costs 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 Over/undervoltage difference	Self-powered 208...480 VAC	Unbalance 5 to 15% 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 Overvoltage Undervoltage	Self-powered 220...480 VAC	Overvoltage 2 to 20% Un phase/phase Undervoltage -20% to -2% Un phase/phase	0.1 to 10 s	2 C/O relays 5 A*	RM35 TF 30
Over/undervoltage between phases	Self-powered 220...480 VAC	Overvoltage 2 to 20% Un phase/phase Undervoltage -20% to -2% 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	Overvoltage 2 to 20% Un phase/neutral Undervoltage -20% to -2% 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	Overvoltage 2 to 20% Un phase/phase Undervoltage -20% to -2% Un phase/phase	0.3 to 30 s	1 C/O relay 5 A	RM17 UB3 10
Phase loss and sequence PTC thermistor probe thermal protection	24...240 VAC/DC 50/60 Hz	Phases : 208...480 VAC Thermal protection: auto reset	-	2 NO relays 5 A	RM35 TM 50 MW
Phase loss and sequence PTC thermistor probe thermal protection	24...240 VAC/DC 50/60 Hz	Phases : 208...480 VAC 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

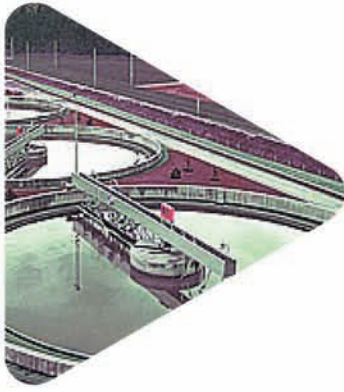
### Current control

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 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 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 Upper threshold: -2 to +10 Hz 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.

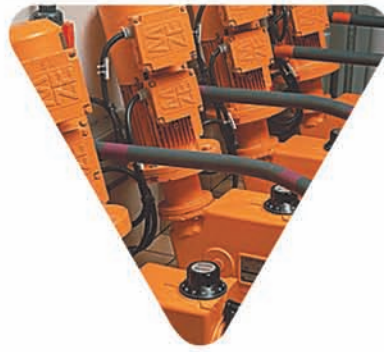
Dedicated to non-conductive materials, relay with digital inputs from sensors allows to achieve level control also comes into the offer



### ► 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

### ► Characteristics

- 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.



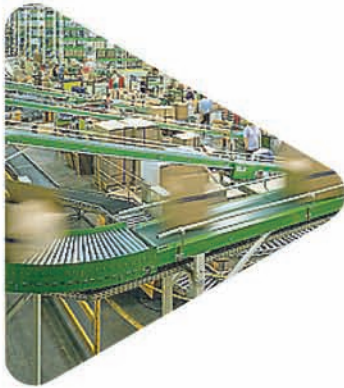
### Level control

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 or 230 VAC 50/60 Hz	Over/undercurrent: 0.1 to 10 A Phase: 208...480 V C	1 to 60 s	1 C/O relay 5 A	RM35 BA 10
Phase loss and sequence in 3-phase					
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:

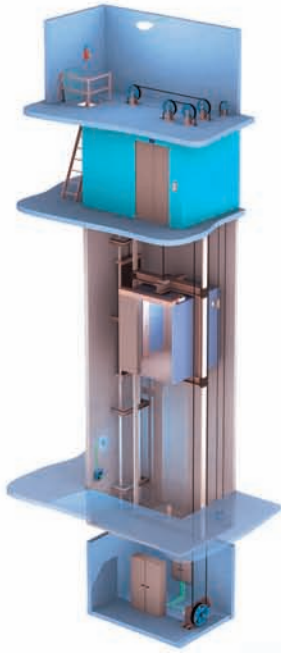
- Inductive sensors on gear wheels,
- Photoelectric sensors on conveyors,
- Microswitches on cams.

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,
- Remotable 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: 0.05 to 0.5 s 0.1 to 1 s 0.5 to 5 s 1 to 10 s 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 Lower threshold: -1°C to +11°C 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 Lower threshold: -1°C to +11°C Upper threshold: +34°C to +46°C	1 to 10 s	2 NO relays 5 A	RM35 ATR 5 MW
Control room temperature Phase loss (regeneration 70 % Un) and sequence	24 to 240 VAC/DC 50/60 Hz	Inputs: 208...480 V Input PT100 3-wire Lower threshold: -1°C to +11°C Upper threshold: +34°C to +46°C	1 to 10 s	2 NO relays 5 A	RM35 ATW 5 MW



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