

Zelio Control - Monitoring & Control Relays

Multifunction 3-phase control relays
RM22TA, RM22TU, RM22TR, and RM22TG



RM22T●●●

Presentation

RM22 multifunction Zelio control relays monitor the following functions on 3-phase supplies:

Functions	RM22TA	RM22TU	RM22TR	RM22TG
Sequence of phases L1, L2, and L3				
Phase loss				
Asymmetry				
Undervoltage				
Overtoltage and undervoltage				

■ Function performed
■ Function not performed

Depending on the model, RM22T●●● control relays:

- Accept different nominal 3-phase voltages: up to 480 V~
- Monitor their own power supply measured as a true rms value
- Are designed for clip-on mounting on a rail

They feature a:

- Sealable cover to help protect the settings
- Diagnostic button for load circuit testing
- Relay output status LED
- Fault detection indication LED
- Dial pointer LED indicator for relay power ON status
- Relay output On-delay or Off-delay

Applications

- Control for connection of moving equipment (site equipment, agricultural equipment, refrigerated trucks)
- Control against reverse motor operation (lifting, handling, elevators, escalators, etc.)
- Control of sensitive 3-phase supplies
- Emergency power supply switching in abnormal conditions

Description

RM22TA, RM22TU, RM22TR, RM22TG

- 1a Voltage range selector switch
- 1b Voltage range/On-Off delay selector
- 2 Time delay adjustment potentiometer Tt
- 3a Asymmetry threshold setting potentiometer $Asym$
- 3b Undervoltage setting potentiometer $<U$
- 3c Overtoltage setting potentiometer $>U$
- 4 Diagnostic button

Operating principle

Multifunction 3-phase supply control relays monitor:

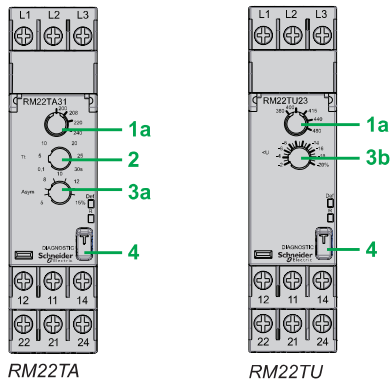
- Product being powered by L1 and L3
- Correct sequencing of phases L1, L2, and L3
- LED indication for relay output status and fault detection (except phase disconnection)
- Phase loss, including in the case of voltage regeneration
- Undervoltage from -2...-20% of the supply voltage U_n
- Overtoltage from 2...20% of the supply voltage U_n
- Asymmetry from 5...15% of the supply voltage U_n

Function Diagram

- Output 11-14, 21-24 open
- Output 11-14, 21-24 closed

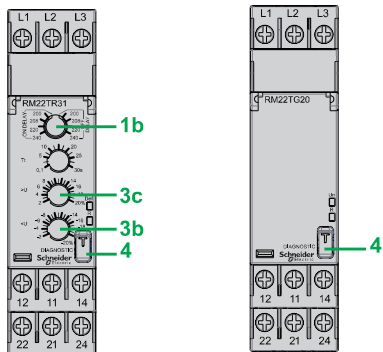
Voltage switch operation:

- Set the switch to 3-phase supply voltage U_n .
- The position of this switch is 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.
- If the switch is returned to the original position selected prior to the last energization, the LEDs return to their normal state.



RM22TA

RM22TU



RM22TR

RM22TG

Un Green LED: indicates that supply to the product is on
R Yellow LED: indicates relay output status
DEF Yellow LED: indicates fault detection

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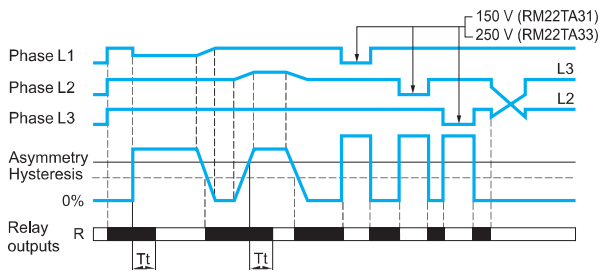
Multifunction 3-phase control relays
RM22TA, RM22TU, RM22TR, and RM22TG

Operating principle (continued)

RM22TA

Phase + Asymmetry

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



The relay monitors its own supply voltage U_n :

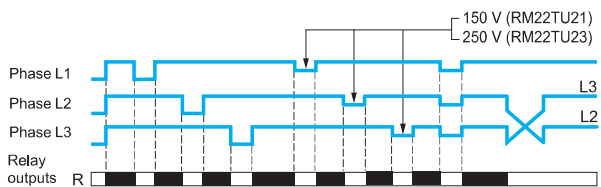
- correct sequence of three phases
- phase loss of at least one of the three phases (U measured < 150 V (RM22TA31) and < 250 V (RM22TA33))
- asymmetry adjustable from 5...15% of U_n
- If a sequencing or phase loss fault is detected, the relay opens instantly.
- If an asymmetry fault is detected, the relay opens at the end of the time delay set by the user.
- On energization of the device with a detected measured fault, the relay stays open.

Note: T_t : time delay after crossing of the threshold (adjustable on the front panel)

RM22TU

Phase + Undervoltage

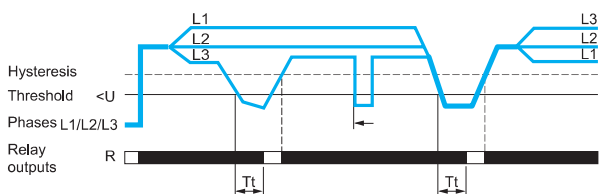
- Sequence of phases L1, L2, and L3
- Phase loss



The relay monitors its own supply voltage U_n :

- correct sequence of the three phases
- phase loss of at least one of the three phases (U measured < 150 V (RM22TU21) and < 250 V (RM22TU23))
- undervoltage adjustable from -2...-20% of U_n
- If a sequencing or phase loss fault is detected, the relay opens instantly.
- If a voltage fault is detected, the relay opens instantly.
- On energization of the device with a detected measured fault, the relay stays open.

- Undervoltage control $<U$



Note: T_t : time delay after crossing of the threshold

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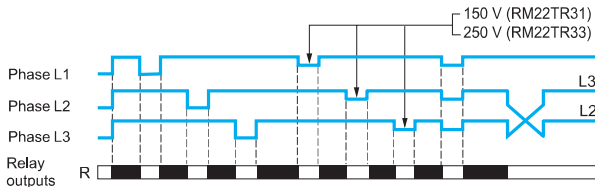
Multifunction 3-phase control relays
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Operating principle (continued)

RM22TR

Phase + Undervoltage/overvoltage

- Sequence of phases L1, L2, and L3
- Phase loss



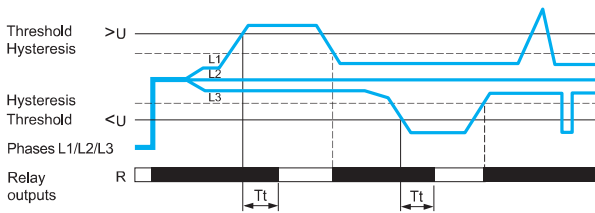
The relay monitors its own supply voltage U_n :

- phase loss (U measured $< 150\text{ V}$ (RM22TR31) and $< 250\text{ V}$ (RM22TR33))

- undervoltage and overvoltage

- An adjustable time delay on threshold crossing provides immunity to transients, and helps prevent spurious triggering of the output relay.
- If a voltage fault is detected, the relay opens at the end of the time delay set as On-delay or Off-delay by the user.
- On energization of the device with a detected measured fault, the relay stays open.
- In the event of phase loss, the relay opens instantly.

- Overvoltage and undervoltage (Off-delay)

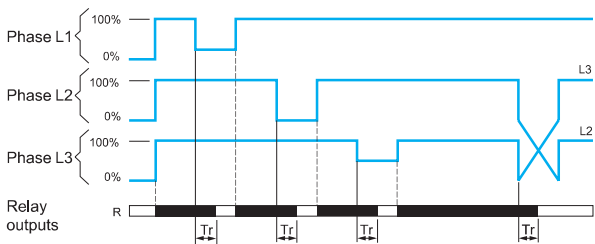


Note: T_t : time delay after crossing of the threshold (adjustable on the front panel)

RM22TG

Phase control

- Sequence of phases L1, L2, and L3
- Phase loss



The RM22TG relay monitors:

- correct sequencing of the three phases
- total loss of one or more of the three phases

- When the phase sequence and voltages are correct ($> 183\text{ V}\sim$), the output relays are closed and the R LED is on.

- When there is a sequencing fault or total loss of one or more phases (detected as soon as one of the voltages drops below 100 V) the relay opens instantly and the R LED goes off.

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

Note: T_r : response time on appearance of a fault

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RM22TA31



RM22TR31



RM22TG20



RM22TU21

References					
Function	Measurement range	Time delay	Output	Reference	Weight
					kg/lb
<ul style="list-style-type: none"> ■ Phase sequence ■ Phase loss ■ Asymmetry 	200...240 ~	Off delay (0.1...30 s)	2 CO 8 A	RM22TA31	0.090/ 0.198
	380...480 ~	Off delay (0.1...30 s)	2 CO 8 A	RM22TA33	0.090/ 0.198
<ul style="list-style-type: none"> ■ Phase sequence ■ Phase loss ■ Undervoltage and overvoltage 	200...240 ~	On/Off delay (0.1...30 s)	2 CO 8 A	RM22TR31	0.090/ 0.198
	380...480 ~	On/Off delay (0.1...30 s)	2 CO 8 A	RM22TR33	0.090/ 0.198
<ul style="list-style-type: none"> ■ Phase sequence ■ Phase loss ■ Undervoltage 	200...240 ~	No	2 CO 8 A	RM22TU21	0.090/ 0.198
	380...480 ~	No	2 CO 8 A	RM22TU23	0.090/ 0.198
<ul style="list-style-type: none"> ■ Phase sequence ■ Phase loss 	183...528 ~	No	2 CO 8 A	RM22TG20	0.090/ 0.198