Zelio Control - Monitoring & Control Relays
Multifunction 3-phase control relays
RM22TA, RM22TU, RM22TR, and RM22TG

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

<table>
<thead>
<tr>
<th>Functions</th>
<th>RM22TA</th>
<th>RM22TU</th>
<th>RM22TR</th>
<th>RM22TG</th>
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<tr>
<td>Sequence of phases L1, L2, and L3</td>
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<td>Phase loss</td>
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<td>Asymmetry</td>
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<tr>
<td>Undervoltage and undervoltage</td>
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</table>

- 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 DIN rail

They feature:
- 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 Overvoltage 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 Un
- Overvoltage from 2...20% of the supply voltage Un
- Asymmetry from 5...15% of the supply voltage Un

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

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

Voltage switch operation:
- Set the switch to 3-phase supply voltage Un.
- 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.
### Operation (continued)

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Multifunction 3-phase control relays

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#### Operating principle (continued)

**RM22TA**

**Phase + Asymmetry**

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

The relay monitors its own supply voltage Un:
- 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 Un

- 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: Ti: 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 Un:
- 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 Un

- 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.

*Note: Ti: time delay after crossing of the threshold*
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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 Un:
- **Phase loss** (U measured <150 V (RM22TR31) and < 250 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.

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#### 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 V~), 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:** Tt: time delay after crossing of the threshold (adjustable on the front panel)

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**Note:** Tr: response time on appearance of a fault
# References

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<th>Time delay</th>
<th>Output</th>
<th>Reference</th>
<th>Weight</th>
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<td>Off delay (0.1..30 s)</td>
<td>2 CO</td>
<td>RM22TA31</td>
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