## Time-delay relays from riese

<table>
<thead>
<tr>
<th>Applications</th>
<th>Relay designations (all with CE)</th>
<th>Column</th>
<th>EN 954 safety class</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-delay</td>
<td>RS-VR1, RS-VR2, RS-ZR1, RS-ZR2, RS-ER1, RS-ER2, RS-ERF, RS-EB, RS-LR1, RS-LR2, RS-LZ1, RS-LZ2, RS-LZF</td>
<td>1, 2, 3, 4, 5, 6, 7, 8</td>
<td>1, 1, 1, 1, 1, 1, 1</td>
</tr>
<tr>
<td>Off-delay</td>
<td>RS-AR1, RS-AR2, RS-AZ1, RS-AZ2, RS-LA1, RS-LA2, RS-AZS</td>
<td>9,10, 11, 12</td>
<td>1, 1, 1, 1, 1, 1, 1, 1</td>
</tr>
<tr>
<td>Flashing</td>
<td>RS-BR1, RS-BR2, RS-BRS1, RS-BRS2</td>
<td>13, 14</td>
<td>1, 1, 1</td>
</tr>
<tr>
<td>Clock-pulsed</td>
<td>RS-TG1, RS-TG2, RS-TGI1, RS-TGI2</td>
<td>15, 16</td>
<td>1, 1, 1</td>
</tr>
<tr>
<td>Multifunction</td>
<td>RS-MF</td>
<td>17</td>
<td>1, 1, 1</td>
</tr>
<tr>
<td>Interval time-delay</td>
<td>RS-EI1, RS-EI2, RS-EIF, RS-WAR, RS-WAR2</td>
<td>18, 19, 20</td>
<td>1, 1, 1</td>
</tr>
<tr>
<td>Star-delta</td>
<td>RS-SD, RS-SDS</td>
<td>21, 22</td>
<td>1, 1, 1</td>
</tr>
</tbody>
</table>
### Time-delay On-delay

#### Type
<table>
<thead>
<tr>
<th>Type</th>
<th>RS-VR1, RS-VR2</th>
<th>RS-ZR1, RS-ZR2</th>
<th>RS-ER1, RS-ER2</th>
<th>RS-ERF</th>
<th>RS-EB</th>
<th>RS-LR1, RS-LR2</th>
<th>RS-LZ1, RS-LZ2</th>
<th>RS-LZF</th>
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</thead>
<tbody>
<tr>
<td>Function/Contact</td>
<td>On-delay</td>
<td>On-delay</td>
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<td>On-delay</td>
<td>On-delay</td>
<td>On-delay</td>
<td>On-delay</td>
</tr>
<tr>
<td>Pulse schedule/Function diagram</td>
<td>1 time-delay (RS-VR1)</td>
<td>1 time-delay (RS-VR2)</td>
<td>1 time-delay (RS-ZR1)</td>
<td>1 time-delay (RS-ZR2)</td>
<td>1 time-delay and remote connection</td>
<td>1 time-delay (RS-ER1)</td>
<td>1 time-delay (RS-ER2)</td>
<td>1 time-delay and remote connection</td>
</tr>
<tr>
<td>Wiring diagram</td>
<td><img src="image" alt="Wiring diagram" /></td>
<td><img src="image" alt="Wiring diagram" /></td>
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<tr>
<td>LED</td>
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<tr>
<td>Timing ranges</td>
<td>0.05 - 1 s</td>
<td>0.05 - 1 s</td>
<td>0.05 - 1 s</td>
<td>0.05 - 1 s</td>
<td>0.05 - 1 s</td>
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<td>0.05 - 1 s</td>
<td>0.05 - 1 s</td>
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<tr>
<td>Dimensions</td>
<td>see diagram</td>
<td>see diagram</td>
<td>see diagram</td>
<td>see diagram</td>
<td>see diagram</td>
<td>see diagram</td>
<td>see diagram</td>
<td>see diagram</td>
</tr>
<tr>
<td>Characteristics</td>
<td>12 V AC/DC</td>
<td>12 V AC/DC</td>
<td>12 V AC/DC</td>
<td>12 V AC/DC</td>
<td>12 V AC/DC</td>
<td>12 V AC/DC</td>
<td>12 V AC/DC</td>
<td>12 V AC/DC</td>
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<tr>
<td>Time delays</td>
<td>10-60 s</td>
<td>10-60 s</td>
<td>10-60 s</td>
<td>10-60 s</td>
<td>10-60 s</td>
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<tr>
<td>Circuit diagrams</td>
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<td><img src="image" alt="Circuit diagrams" /></td>
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<tr>
<td>Description of function</td>
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<td>Notes</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Columns</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
</tbody>
</table>
**Type** | RS-AR1, RS-AR2 | RS-AZ1, RS-AZ2 | RS-LA1, RS-LA2 | RS-AZS
---|---|---|---|---
**Function/Contact** | Off-delay without auxiliary voltage | Off-delay with auxiliary voltage 1 change-over contact (RS-AR1) | Off-delay with auxiliary voltage 1 change-over contact (RS-AZ1) | Off-delay 1 change-over contact
---|---|---|---|---
**Voltage supply on/off** | | | |
**Closed/open** | tv | tv | tv | tv
| A1 | 15 | 18 | 16 | 16
| A2 | 16 | 15 | 18 | 18

**Pulse schedule/Function diagram**

**Wiring diagram**

**LED** | 1 LED | 2 LEDs | 2 LEDs | none
---|---|---|---|---
| tv | tv | tv | tv

**Timing ranges**

| 0.05 | 1 s | 1.5 | 30 min |
| 0.15 | 3 s | 3 | 60 min |
| 0.5 | 10 s | 10 | 10 s |
| 1.5 | 30 s | 30 s | 300 s |
| 3 | 60 s | 60 s | 600 s |
| 5 | 100 s | 100 s | |
| 10 | 300 s | 300 s | |
| 30 | 600 s | 600 s | |
| 50 | 10 min | 10 min | |
| 100 | 30 min | 30 min | |

**Dimensions**

| see diagram | see diagram | see diagram | see diagram |

**Exciting voltage**

| 24 V AC/DC | 12 V AC/DC | 12 V AC/DC | 12 V AC/DC |
| 42-48 V AC | 24 V AC/DC | 24 V AC/DC | 24 V AC/DC |
| 110-127 V AC | 42-48 V AC | 42-48 V AC | 42-48 V AC |
| 230 V AC | 110-127 V AC | 110-127 V AC | 110-127 V AC |
| 230 V AC | 230 V AC | 230 V AC | |

**Tolerances**

| 4% | 4% | 4% | 4% |

**Attributes**

<table>
<thead>
<tr>
<th>CMOS technology</th>
<th>Analog time setting</th>
<th>Absolute scale</th>
<th>CMOS technology</th>
<th>Analog time setting</th>
<th>Absolute scale</th>
<th>CMOS technology</th>
<th>Analog time setting</th>
<th>Absolute scale</th>
<th>CMOS technology</th>
<th>Analog time setting</th>
<th>Absolute scale</th>
</tr>
</thead>
</table>

**Description of function**

**Fixed times:** 1 s, 3 s, 10 s, 30 s, 60 s, 100 s, 300 s, 600 s

**Time-delay Off-delay**

These devices are off-delay time-lag relays without auxiliary voltage. After applying the exciting voltage to terminals A1 and A2 the output relay attracts instantaneously. If the exciting voltage is interrupted the output relay remains closed and the time begins. After expiring of the set time the output relay returns to its basic position.

**Release delaying relays under auxiliary current.** They are controlled by a separate start contact potential-free. During operation of the device exciting voltage needs to be available at terminals A1 and A2. After closing the potential free start contact B1-B2, the outlet relay will close immediately. After opening the start contact, the outlet relay remains closed and the timing will start. After the chosen time, the outlet relay goes back into its basic position. Voltage at terminals B1 and B2 is 24 V DC. In closed position of the start contact current of approx. 10 mA will be measured. Min. operation time of the start contact is 5 ms.

**Caution:** There is no galvanic isolation between connectors B1 or B2 and exciting voltage A1 and A2.
### Time-delay Flashing

<table>
<thead>
<tr>
<th>Type</th>
<th>RS-BR1, RS-BR2</th>
<th>RS-BRS1, RS-BRS2</th>
</tr>
</thead>
</table>
| Function/Contact | Flashing  
(1 change-over contact (RS-BR1))  
(2 change-over contacts (RS-BR2)) | Flashing 
(1 change-over contact (RS-BRS1))  
(2 change-over contacts (RS-BRS2)) |
| Pulse schedule/Function diagram | ![Diagram](image1)  
LED | ![Diagram](image2)  
LED |
| Wiring diagram | ![Diagram](image3)  
LED | ![Diagram](image4)  
LED |
| Timing ranges | Fixed clock - pulse times:  
0.25 - 0.25 s  
0.5 - 0.5 s  
0.75 - 0.75 s  
1 - 1 s  
1.5 - 1.5 s | Variable clock - pulse times:  
0.15 - 3 s |
| Dimensions | see diagram | see diagram |
| Exciting voltage | 12 V AC/DC  
24 V AC/DC  
40-48 V AC  
110 V AC  
230 V AC | 12 V AC/DC  
24 V AC/DC  
40-48 V AC  
110 V AC  
230 V AC |
| Tolerances | 10%  
10% | 10%  
10% |
| Attributes | CMOS technology  
Analog time setting  
Absolute scale | CMOS technology  
Analog time setting  
Absolute scale |
| Description of function | These devices are flashing relays with fixed interval/pulse ratios and fixed clock-pulse time (RS-BR). After applying the exciting voltage to terminal A1 and A2, the time-lag of the interval begins. The output relay remains in its basic position. After the interval has expired, the output relay attracts and remains in this switched position until the pulse time has expired. This procedure repeats in a cycle until the exciting voltage is interrupted. | These devices are flashing relays with fixed interval/pulse ratios and variable clock-pulse time. The time-lag of the interval begins upon applying the exciting voltage to terminal A1 and A2. The output relay remains in its basic position. After the interval has expired, the output relay attracts and remains in this switched position until the pulse time has expired. This procedure repeats in a cycle until the exciting voltage is interrupted. |
Time-delay Clock-pulsed

**Type**
- RS-TG1, RS-TG2
- RS-TGI1, RS-TGI2

**Function/Contact**
- Clock-pulsed
  - 1 change-over contact (RS-TG1)
  - 2 change-over contacts (RS-TG2)
- Clock-pulsed
  - 1 change-over contact (RS-TGI1)
  - 2 change-over contacts (RS-TGI2)

**Pulse schedule/Function diagram**

**Wiring diagram**

**LED**

**Timing ranges**
- Pulse and interval times from any combination of the following:
  - 0.05 - 1 s
  - 0.15 - 3 s
  - 1.5 - 30 s
  - 5 - 100 s
  - 15 - 300 s
  - 30 - 600 s
- Pulse and interval times from any combination of the following:
  - 0.05 - 1 s
  - 0.15 - 3 s
  - 1.5 - 30 s
  - 5 - 100 s
  - 15 - 300 s
  - 30 - 600 s

**Dimensions**
- See diagram
- See diagram

**Exciting voltage**
- 24 V AC/DC
- 42-48 V AC
- 110-127 V AC
- 230 V AC
- 24 V AC/DC
- 42-48 V AC
- 110-127 V AC
- 230 V AC

**Tolerances**
- 4%
- 4%

**Attributes**
- CMOS technology
- Analog time setting
- Relative scale
- CMOS technology
- Analog time setting
- Relative scale

**Description of function**
- These devices are repeat cycle timers with individually adjustable pulse and interval times. After applying the exciting voltage to terminal A1 and A2 the time-lag of the interval begins. The output relay remains in its basic position. After the interval has expired, the output relay attracts and remains in this switched position until the pulse time has expired. This procedure repeats in a cycle until the exciting voltage is interrupted.
- These devices are repeat cycle timers with individually adjustable pulse and interval times. After applying the exciting voltage to terminal A1 and A2 the time-lag of the interval begins. The output relay attracts instantaneously and it remains in this switched position until the pulse time is over. After the pulse time has expired, the output relay returns to its basic position and the interval begins. This procedure repeats in a cycle until the exciting voltage is interrupted.

| Column | 15 | 16 |
## Time-delay Multifunction

<table>
<thead>
<tr>
<th>Type</th>
<th>RS-MF</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Function/ Contact</strong></td>
<td>Multifunction relay 2 change-over contacts</td>
</tr>
<tr>
<td><strong>Pulse schedule/ Function diagram</strong></td>
<td>Pulse schedule depends on function:</td>
</tr>
<tr>
<td><strong>EV</strong></td>
<td>see col. 1</td>
</tr>
<tr>
<td><strong>AV</strong></td>
<td>see col. 12</td>
</tr>
<tr>
<td><strong>EW</strong></td>
<td>see col. 20</td>
</tr>
<tr>
<td><strong>TP</strong></td>
<td>see col. 15</td>
</tr>
<tr>
<td><strong>TI</strong></td>
<td>see technical data</td>
</tr>
<tr>
<td><strong>EWI</strong></td>
<td>see technical data</td>
</tr>
<tr>
<td><strong>Wiring diagram</strong></td>
<td><a href="#">Diagram</a></td>
</tr>
<tr>
<td><strong>LED</strong></td>
<td>2 LEDs</td>
</tr>
<tr>
<td><strong>Timing ranges</strong></td>
<td>0.15 - 3 s  0.6 - 12 s  5 - 100 s  40 - 800 s  or  0.15 - 3 min  0.6 - 12 min  5 - 100 min  40 - 800 min</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>see diagram</td>
</tr>
<tr>
<td><strong>Exciting voltage</strong></td>
<td>Exciting voltage 1 (A1-A2) 90-250 V AC and exciting voltage 2 (A1-A3) 24 V AC/DC (only one voltage may be applied to the relay at the same time)</td>
</tr>
<tr>
<td><strong>Tolerances</strong></td>
<td>4%</td>
</tr>
<tr>
<td><strong>Attributes</strong></td>
<td>CMOS technology Analog time setting Relative scale</td>
</tr>
<tr>
<td><strong>Description of function</strong></td>
<td>The functions:  <strong>EV</strong> = on-delay  <strong>AV</strong> = off-delay  with auxiliary voltage  <strong>EW</strong> = making-pulse contact/pulse clipping  <strong>TP</strong> = clock-pulsed, starting with interval  <strong>TI</strong> = clock-pulsed, starting with pulse  <strong>EWI</strong> = making-pulse contact/pulse forming can be set by means of DIP-switches on the front</td>
</tr>
</tbody>
</table>

### Timing ranges

- 0.15 - 3 s
- 0.6 - 12 s
- 5 - 100 s
- 40 - 800 s
- 0.15 - 3 min
- 0.6 - 12 min
- 5 - 100 min
- 40 - 800 min

### Exciting voltage

- Exciting voltage 1 (A1-A2): 90-250 V AC

### Attributes

- CMOS technology
- Analog time setting
- Relative scale
### Time-delay Interval-time-delay

<table>
<thead>
<tr>
<th>Column</th>
<th>18</th>
<th>19</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>RS-EI1, RS-EI2</td>
<td>RS-EI2</td>
<td>RS-WAR</td>
</tr>
<tr>
<td>Function/Contact</td>
<td>Internal time-delay relay</td>
<td>Interval time-delay relay</td>
<td>Internal time-delay relay</td>
</tr>
<tr>
<td>Pulse schedule/Function diagram</td>
<td>1 change-over contact (RS-EI1)</td>
<td>1 change-over contact and remote connection (RS-EI2)</td>
<td>1 change-over contact (RS-WAR)</td>
</tr>
<tr>
<td>Wiring diagram</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LED</td>
<td>2 LEDs</td>
<td>2 LEDs</td>
<td>No</td>
</tr>
<tr>
<td>Timing ranges</td>
<td>0.05 - 1 s</td>
<td>0.05 - 1 s</td>
<td>Fixed time</td>
</tr>
<tr>
<td></td>
<td>0.15 - 3 s</td>
<td>0.15 - 3 s</td>
<td>0.5 s</td>
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<tr>
<td></td>
<td>0.5 - 10 s</td>
<td>0.5 - 10 s</td>
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<td></td>
<td>1.5 - 30 s</td>
<td>1.5 - 30 s</td>
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<td>5 - 60 s</td>
<td>5 - 60 s</td>
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<td>10 - 300 s</td>
<td>10 - 300 s</td>
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<td></td>
<td>30 - 600 s</td>
<td>30 - 600 s</td>
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<tr>
<td>Dimensions</td>
<td>see diagram</td>
<td>see diagram</td>
<td>see diagram</td>
</tr>
<tr>
<td>Exciting voltage</td>
<td>24 V AC/DC</td>
<td>24 V AC/DC</td>
<td>24 V AC/DC</td>
</tr>
<tr>
<td></td>
<td>42-48 V AC</td>
<td>42-48 V AC</td>
<td>110-127 V AC</td>
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<td>110-127 V AC</td>
<td>110-127 V AC</td>
<td>230 V AC</td>
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<td>230 V AC</td>
<td>230 V AC</td>
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<tr>
<td>Tolerances</td>
<td>10%</td>
<td>10%</td>
<td>20%</td>
</tr>
<tr>
<td>Attributes</td>
<td>CMOS technology</td>
<td>CMOS technology</td>
<td>Analog time setting</td>
</tr>
<tr>
<td>Description of function</td>
<td>These devices are electronic pulse-clipping relays. After applying the exciting voltage to terminal A1 and A2, the output relay attract instantaneously and remains in the switched position for the set time. Then it returns to its basic position.</td>
<td>Resistance value for all time ranges is 10 KΩ. When connecting an external potentiometer for setting the time, the factory-fitted jumper has to be removed. The remote potentiometer has to be connected to the terminal Z1 and Z2. The integrated potentiometer has to be set to the shortest time. The lines to the external potentiometer can be up to 100 m long. Note: there is no electrical isolation between terminal Z1 and Z2 and the exciting voltage A1 and A2.</td>
<td>These devices are electronic pulse-clipping relays. The functions: ( EW ) = making-pulse contact; ( AW ) = breaking-pulse contact; ( EW/AW ) = making- and breaking-pulse contact. Can be set via jumpers at terminals X1, X2 and X3. X1-X2 = EW; X2-X3 = AW; no jumper = EW/AW</td>
</tr>
</tbody>
</table>

Note: There is no electrical isolation between terminal Z1 and Z2 and the exciting voltage A1 and A2.
Time-delay Star-delta

### Type
- **RS-SD**: Star-delta relay
  - 1 change-over contact with delayed change-over
- **RS-SDS**: Star-delta relay
  - 2 normally closed contact with delayed change-over

### Pulse schedule/Function diagram

#### Wiring diagram

**LED**
- 2 LEDs

**Timing ranges**
- **RS-SD**
  - 1.5 - 30 s
  - 3 - 60 s
  - 5 - 100 s
  - Change-over times: 30, 50, 100 ms
- **RS-SDS**
  - 1.5 - 30 s
  - 3 - 60 s
  - 5 - 100 s
  - Change-over times: 30, 50, 100 ms

### Exciting voltage
- **RS-SD**
  - 24 V AC/DC
  - 42-48 V AC
  - 110-127 V AC
  - 230 V AC
- **RS-SDS**
  - 24 V AC/DC
  - 42-48 V AC
  - 110-127 V AC
  - 230 V AC

### Tolerance
- 4%

### Attributes
- CMOS technology
- Analog time setting
- Absolute scale

### Description of function
**RS-SD**
- This is an on-delay time-lag relay with change over time. After applying the exciting voltage to terminal A1 and A2, the time-lag begins. The output relay remains in its basic position. After expiry of time, the output relay attracts with a change-over time and returns in this switched position until the exciting voltage is interrupted. If there is an interruption of the exciting voltage the relay returns to its basic position.

**RS-SDS**
- The RS-SDS is a time delayed relay for four star-delta switching. After connecting the voltage supply to terminal A1 and A2, the NO-contact 1 (17-18) will close immediately and stay in this position with the duration of the adjusted time t1. At the end of this time t1 and end of the switching time (selectable time of 30, 50 and 100 ms), the NO-contact 1 (17-18) opens and NO-contact 2 (27-28) closes. NO-contact 2 keeps closed until disconnecting the voltage supply. After disconnecting the voltage supply the RS-SDS falls back in its basic position (NO-contact 1 and 2 are open).

### Columns
- 21
- 22
Technical specifications

Dimensions (of different housings and terminals)

Voltage drift
- +/- 0.001\% / \% \Delta U (CMOS technology)
- +/- 0.2\% / \% \Delta U (transistor technology)

Temperature drift
- +/- 0.02\% / \% \Delta C (CMOS technology)
- +/- 0.15\% / \% \Delta C (transistor technology)

Repeat accuracy
- +/- 0.5\% (CMOS technology)
- +/- 2.0\% (transistor technology)

Reset time
- 50 ms (CMOS technology)
- 250 ms (transistor technology)

Setting accuracy at end of scale (tolerance)
- +/- 4\%, +/- 10\%, +/- 20\% depending on device

Power consumption
- < 7.5 VA

Voltage tolerance range
- 0.85 - 1.1 x Unom

Max. fuse rating
- 10 A (fast)

Duty cycle
- 100 \% continuous

Max. continuous current
- 10 A AC 1 change-over contact
- 5 A AC 2 change-over contacts
- 1 A DC
- 0.5 A thyristor

Max. switching voltage
- 250 V AC, 50..60 Hz, 250 V DC
- 250 V AC, 50..60 Hz, thyristor

Max. switching rate
- 6000 operations/h

Electrical life on load
- see diagram

Contact material
- silver cadmium oxide / hard silver or equivalent material

Ambient temperature
- -25°C to +70°C

Climatic resistance
- to DIN 40040, class F

Shock/Vibration resistance
- 6 g in all 3 directions, approx. 32 Hz

Test voltage
- 2500 V, 50 Hz

Standards
- to DIN VDE 0435
- to DIN VDE 0110-2

Operating position
- no restriction

Weight
- approx. 120 g

Class of protection
- Terminals and housings to DIN VDE 0470-1, housings IP 50, terminals IP 20. Finger-touch and back-of-hand-touch protection to VDE 0106/100 as well as VBG4.

Conductor
- 2x2.5 mm² solid or 2x1.5 mm² stranded with ferrules

Mounting dimensions
- to DIN EN 50022
- to DIN EN 50005

Visual switching state (green) and voltage supply (red).

Initiator connection triggered via contact or 2-wire-proximity switch with residual current < 5mA.

Not available for the following types: RS-VR1, RS-VR2, RS-EB, RS-AZ1, RS-AZ2, RS-LA1, RS-LA2, RS-AZS, RS-MF, RS-SD, RS-SDS.

We reserve the right to make changes to the technical specification.

We were taking great care making up the texts and drawings. Nevertheless failures cannot be eliminated completely.

Release 2007

Dimensions

Pulse schedule for RS-MF:
Function EWI

Function TI

Contact diagram
Product features:

1. + Mounting on standard 35 mm rails to DIN 46 277 by means of snap-on fixings.
   + Possibility of additional screw fixings for 45 mm housings.
2. + Connecting terminals in standard terminal position.
   + Captive plus/minus screws.
   + Class of protection to DIN VDE 0470-1, IP 20.
   + Finger-touch and back-of-hand-touch protection to VDE 0106/100 as well as VBG 4.
   + Conductors to DIN EN 40050.
   + Initiator connection (if available).
   + SEV prooved.
3. + Self-extinguishing housing material to UL 94-V1.
   + Class of protection to DIN VDE 0470-1, IP 50.
5. + Wireless design.

Outstanding quality

We not just test our relay after it’s finished we test it at every step of production! Our testing strategy thoroughly checks all functions of every single relay by means of a computerized testing system which we developed ourselves. We simulate situations in which the worse scenarios happen all at once. Only after such testing does a relay get the "thumbs-up". Therefore, "riese-relays" are ideally situated to rough environments, e.g. severe vibrations, temperature fluctuations or voltage discrepancies.

Special features

1. **12 V relays**, e.g. for vehicles, vehicle mountings. We have developed a number of relays especially for this purpose. Not all types are included in this leaflet so please call us for details.
2. **24 V relays**, e.g. for railways, tram systems. Peculiar to railways and tram systems is the fact that the voltage changes depending on the number of vehicles. We have managed to overcome these and other specific problems.
3. **Brand-name labeling**
   Do you need relays with your company logo? No problem!
4. **Special designs**
   If you can’t find the relay you’re looking for in our range, then please contact our design department. We relish the opportunity to discover new ways of optimizing your applications.

Who or what is riese electronic?

Since 1958 riese electronic has been developing, purchasing materials worldwide, producing in SMD and wired technologies, and testing electronic components in line with customers' requirements. Time-delay, control and measuring relays bearing the "riese" name have been available since 1987, safety relays since 1991. Riese electronic employs 120 staff at its two plants in Horb, Baden-Württemberg and Zeulenroda, Thuringia.

(Prizes: e.g. "Most innovative medium-sized company of the year 1979")