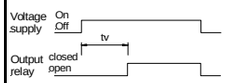
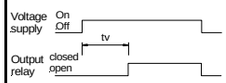
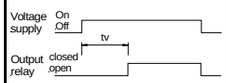
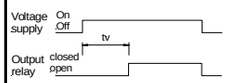
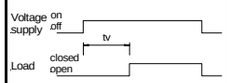
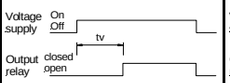
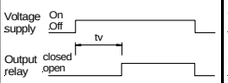
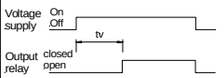
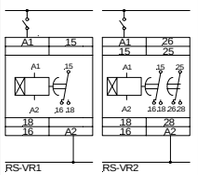
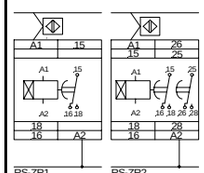
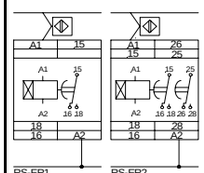
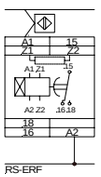
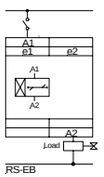
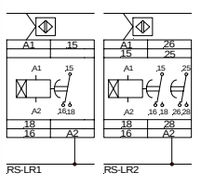
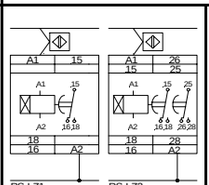
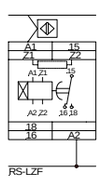
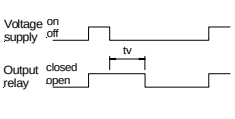
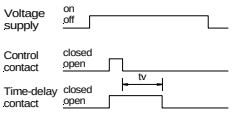
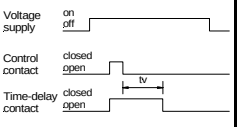
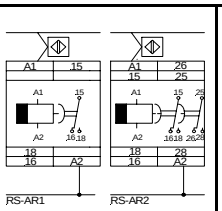
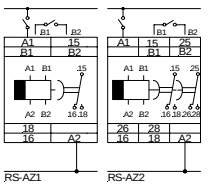
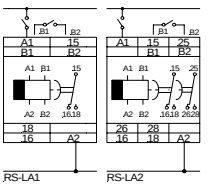
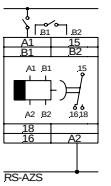
Time-delay relays from riese

Applications	Relay designations (all with CE)	Column	EN 954 safety class
On-delay	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	1 2, 3 4, 5, 6 7, 8	1 1 1 1
Off-delay	RS-AR1, RS-AR2, RS-AZ1, RS-AZ2, RS-LA1, RS-LA2, RS-AZS	9,10 11, 12	1 1
Flashing	RS-BR1, RS-BR2, RS-BRS1, RS-BRS2	13, 14	1
Clock-pulsed	RS-TG1, RS-TG2, RS-TGI1, RS-TGI2	15, 16	1
Multifunction	RS-MF	17	1
Interval time-delay	RS-EI1, RS-EI2, RS-EIF, RS-WAR, RS-WAR2	18, 19, 20	1 1
Star-delta	RS-SD, RS-SDS	21, 22	1

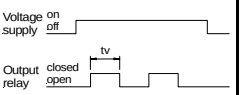
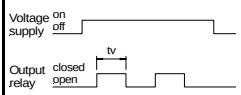
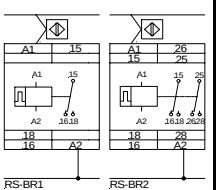
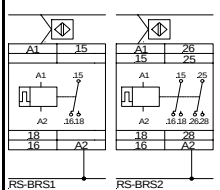
Time-delay On-delay

Type	**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**
Function/ Contact	On-delay 1 time-delay (RS-VR1) 2 time-delay (RS-VR2)	On-delay 1 time-delay (RS-ZR1) 2 time-delay (RS-ZR2)	On-delay 1 time-delay (RS-ER1) 2 time-delay (RS-ER2)	On-delay 1 time-delay and 1 remote connection	On-delay 1 thyristor	On-delay 1 time-delay (RS-LR1) 2 time-delay (RS-LR2)	On-delay 1 time-delay (RS-LZ1) 2 time-delay (RS-LZ2)	On-delay 1 time-delay and 1 remote connection
Pulse schedule/ Function diagram								
Wiring diagram								
LED	No	2 LEDs	2 LEDs	2 LEDs	1 LED	2 LEDs	2 LEDs	2 LEDs
Timing ranges	0.05 - 1 s 0.15 - 3 s 0.5 - 10 s 1.5 - 30 s 3 - 60 s 5 - 100 s 15 - 300 s 30 - 600 s	0.05 - 1 s 0.15 - 3 s 0.5 - 10 s 1.5 - 30 s 3 - 60 s 5 - 100 s 15 - 300 s 30 - 600 s	0.05 - 1 s 0.15 - 3 s 0.5 - 10 s 1.5 - 30 s 3 - 60 s 5 - 100 s 15 - 300 s 30 - 600 s	0.05 - 1 s 0.15 - 3 s 0.5 - 10 s 1.5 - 30 s 3 - 60 s 5 - 100 s 15 - 300 s 30 - 600 s	0.05 - 1 s 0.15 - 3 s 0.5 - 10 s 1.5 - 30 s 3 - 60 s 5 - 100 s 15 - 300 s 30 - 600 s	1.5 - 30 min 3 - 60 min 0.15 - 3 h 0.5 - 10 h	1.5 - 30 min 3 - 60 min 0.15 - 3 h 0.5 - 10 h	1.5 - 30 min 3 - 60 min 0.15 - 3 h 0.5 - 10 h
Dimensions	see diagram	see diagram	see diagram	see diagram	see diagram	see diagram	see diagram	see diagram
Exciting voltage	12 V AC/DC 24 V AC/DC 42-48 V AC 110-127 V AC 230 V AC	12 V AC/DC 24 V AC/DC 42-48 V AC 110-127 V AC 230 V AC	12 V AC/DC 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	10-250 V AC/DC with jumper e1-e2: 10-60 V AC/DC, without jumper: 40-250 V AC/DC	12 V AC/DC 24 V AC/DC 42-48 V AC 110-127 V AC 230 V AC	12 V AC/DC 24 V AC/DC 42-48 V AC 110-127 V AC 230 V AC	12 V AC/DC 24 V AC/DC 42-48 V AC 110-127 V AC 230 V AC
Tolerances	10%	10%	4%	4%	4%	10%	4%	4%
Attributes	CMOS technology Analog time setting Absolute scale	CMOS technology Analog time setting Absolute scale	CMOS technology Analog time setting Absolute scale	CMOS technology Analog time setting Absolute scale	CMOS technology Analog time setting Absolute scale	CMOS technology Analog time setting Absolute scale	CMOS technology Analog time setting Absolute scale	CMOS technology Analog time setting Absolute scale
Description of function	The time lag begins after applying the exciting voltage to terminals A1 und A2. The output relay attracts and remains in this switched position until the exciting voltage is interrupted. When the exciting voltage is interrupted, the output relay returns to its normal position. If the pulse control is shorter than reset time, it does not cause that the output relay switches back through instantaneously.	see col. 1	see col. 1	Resistance value for all time ranges is 10 KΩ. The factory-fitted jumper has to be removed when connecting an external potentiometer for setting the time. The remote potentiometer has to be connected to terminals Z1 and Z2. The integrated potentiometer has to be set to the shortest time. The lines to the external potentiometer can be up to 100m long. **Note:** there is no electrical isolation between terminals Z1 and Z2 and the exciting voltage A1 and A2.	This is an on-delay time-lag relay in 2-wire technology (binary contact). The power supply for the electronics is achieved via the load. The time lag begins after applying the exciting voltage to the series circuit of timing element and load (contactor). After the time has expired, the semiconductor output of the timing element becomes conductive and the load is energized. If the pulse control is shorter than reset time, this does not lead to instantaneous energizing on of the load.	see col. 1	see col. 1	see col. 4
Column	1	2	3	4	5	6	7	8

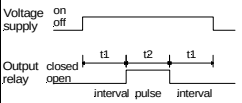
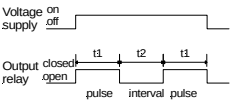
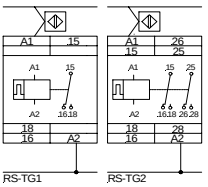
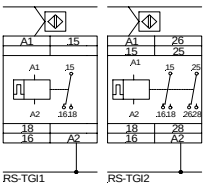
Time-delay Off-delay

Type	**RS-AR1, RS-AR2**	**RS-AZ1, RS-AZ2**	**RS-LA1, RS-LA2**	**RS-AZS**
Function/ Contact	Off-delay without auxiliary voltage 1 change-over contact (RS-AR1) 2 change-over contacts (RS-AR2)	Off-delay with auxiliary voltage 1 change-over contact (RS-AZ1) 2 change-over contacts (RS-AZ2)	Off-delay with auxiliary voltage 1 change-over contact (RS-LA1) 2 change-over contacts (RS-LA2)	Off-delay 1 change-over contact
Pulse schedule/ Function diagram				
Wiring diagram				
LED	1 LED	2 LEDs	2 LEDs	nein
Timing ranges	0.05 - 1 s 0.15 - 3 s 0.5 - 10 s 1.5 - 30 s 3 - 60 s 5 - 100 s 15 - 300 s 30 - 600 s (not possible with 24 V AC/DC)	0.05 - 1 s 0.15 - 3 s 0.5 - 10 s 1.5 - 30 s 3 - 60 s 5 - 100 s 15 - 300 s 30 - 600 s	1.5 - 30 min 3 - 60 min 0.15 - 3 h 0.5 - 10 h	Fixed times: 1 s, 3 s, 10 s, 30 s, 60 s, 100 s, 300 s, 600 s
Dimensions	see diagram	see diagram	see diagram	see diagram
Exciting voltage	24 V AC/DC 42- 48 V AC 110-127 V AC 230 V AC	12 V AC/DC 24 V AC/DC 42-48 V AC 110-127 V AC 230 V AC	12 V AC/DC 24 V AC/DC 42-48 V AC 110-127 V AC 230 V AC	12 V AC/DC 24 V AC/DC 42-48 V AC 110-127 V AC 230 V AC
Tolerances	4%	4%	4%	4%
Attributes	CMOS technology Analog time setting Absolute scale	CMOS technology Analog time setting Absolute scale	CMOS technology Analog time setting Absolute scale	CMOS technology Fixed times
Description of function	These devices are off-delay time-lag relays without auxiliary voltage. After applying the exciting voltage to terminals A1 und 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.	These devices are 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 choosen 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 meassured 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.	see col. 10	see col. 10
Column	9	10	11	12

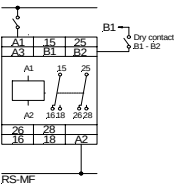
Time-delay Flashing

Type	**RS-BR1, RS-BR2**	**RS-BRS1, RS-BRS2**
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		
Wiring diagram		
LED	2 LEDs	2 LEDs
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 42-48 V AC 110 V AC 230 V AC	12 V AC/DC 24 V AC/DC 42-48 V AC 110 V AC 230 V AC
Tolerances	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 clockpulse 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.
Column	13	14

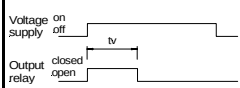
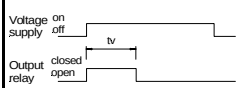
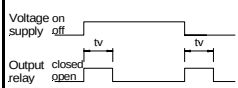
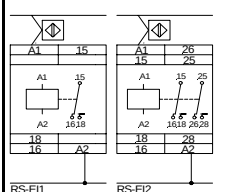
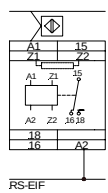
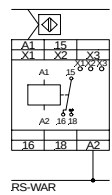
Time-delay Clock-pulsed

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	1LED	1LED
Timing ranges	Pulse and interval times from any combination of the following: 0.05 - 1 s 0.15 - 3 s 0.5 - 10 s 1.5 - 30 s 3 - 60 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 0.5 - 10 s 1.5 - 30 s 3 - 60 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

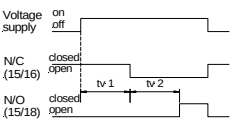
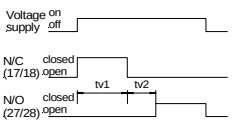
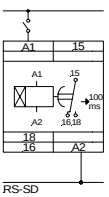
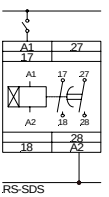
Time-delay Multifunction

Type	**RS-MF**
Function/ Contact	Multifunction relay 2 change-over contacts
Pulse schedule/ Function diagram	Pulse schedule depends on function: EV see col. 1 AV see col. 12 EW see col. 20 TP see col. 15 TI see technical data EWI see technical data
Wiring diagram	
LED	2 LEDs
Timing ranges	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
Dimensions	see diagram
Exciting voltage	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)
Tolerances	4%
Attributes	CMOS technology Analog time setting Relative scale
Description of function	The functions: EV = on-delay AV = off-delay with auxiliary voltage EW = making-pulse contact/ pulse clipping TP = clock-pulsed, starting with interval TI = clock-pulsed, starting with pulse EWI = making-pulse contact/ pulse forming can be set by means of DIP-switches on the front.

Time-delay Interval-time-delay

Type	**RS-EI1, RS-EI2**	**RS-EIF**	**RS-WAR**
Function/ Contact	Interval time-delay relay 1 change-over contact (RS-EI1) 2 change-over contacts (RS-EI2)	Interval time-delay relay 1 change-over contact and remote connection	Interval time-delay relay 1 change-over contact (RS-WAR)
Pulse schedule/ Function diagram			
Wiring diagram			
LED	2 LEDs	2 LEDs	no
Timing ranges	0.05 - 1 s 0.15 - 3 s 0.5 - 10 s 1.5 - 30 s 3 - 60 s 5 - 100 s 15 - 300 s 30 - 600 s	0.05 - 1 s 0.15 - 3 s 0.5 - 10 s 1.5 - 30 s 3 - 60 s 5 - 100 s 15 - 300 s 30 - 600 s	Fixed time: 0.5 s
Dimensions	see diagram	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	24 V AC/DC 110-127 V AC 230 V AC
Tolerances	10%	10%	20%
Attributes	CMOS technology Analog time setting Absolute scale	CMOS technology Analog time setting Absolute scale	Analog time setting Fixed time
Description of function	These devices are electronic pulse-clipping relays. After applying the exciting voltage to terminal A1 and A2, the output relay attracts instantaneously and remains in this switched position for the set time. Then it returns to its basic position.	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.	These devices are electronic pulse-clipping relays The functions: EW = making-pulse contact AW = breaking-pulse contact and 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
Column	18	19	20

Time-delay Star-delta

Type	**RS-SD**	**RS-SDS**
Function/ Contact	Star-delta relay 1 change-over contact with delayed change-over	Star-delta relay 2 normaly closed contact with delayed change-over
Pulse schedule/ Function diagram		
Wiring diagram	 RS-SD	 RS-SDS
LED	2 LEDs	2 LEDs
Timing ranges	1.5 - 30 s 3 - 60 s 5 - 100 s Change-over times: 30, 50, 100 ms	1.5 - 30 s 3 - 60 s 5 - 100 s Change-over times: 30, 50, 100 ms
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 Absolute scale	CMOS technology Analog time setting Absolute scale
Description of function	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 remains 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.	The RS-SDS is a time delayed relay four star-delta switching. After connecting the voltage supply to terminal A1 and A2, the NO-contact 1 (17-18) will close immediately and will stay in this position with the duration of the adjusted time tv1. At the end of the time tv1 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) close. 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).
Column	21	22

Technical specifications

Dimensions	(of different housings and terminals)
Voltage drift	+/- 0.001% / % ΔU (CMOS technology)
	+/- 0.2% / % ΔU (transistor technology)
Temperature drift	+/- 0.02% / ΔC (CMOS technology)
	+/- 0.15% / ΔC (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 1change-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
Mechanical life	$3x10^7$ operations, 10^8 thyristor
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	5 g in all 3 directions, approx. 32 Hz
Test voltage	2500 V, 50 Hz
Standards	to DIN VDE 0435
Leakage paths / Air gaps	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
Terminal markings	to DIN EN 50005

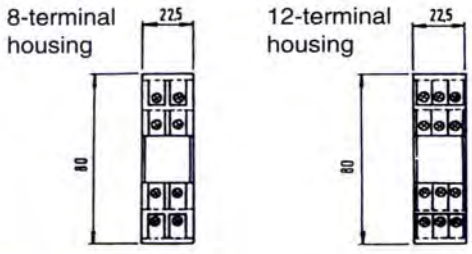
Visual switching state (green) and voltage supply (red).

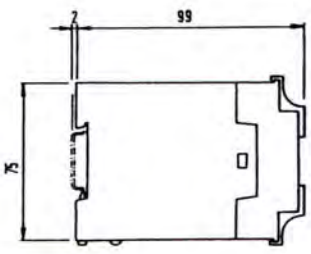
Initiator connection triggered via contact or 2-wire-proximity switch with residual current < 5mA.
Not available for the following types: RS-VR1, RS-VR2, RS-EB, RS-AZ1, RS-AZ2, RS-LA1, RS-LA2, RS-AZS, RS-MF, RS-SD, RS-SDS.

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

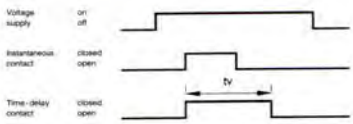
Dimensions



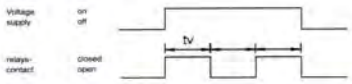


Puls schedule for RS-MF:

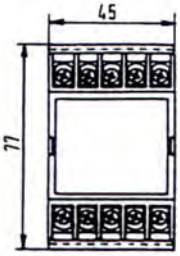
Function EWI



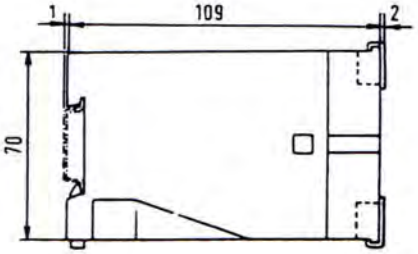
Function TI



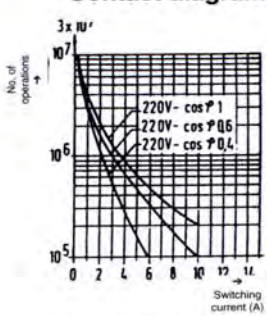
Dimension



45 mm housing

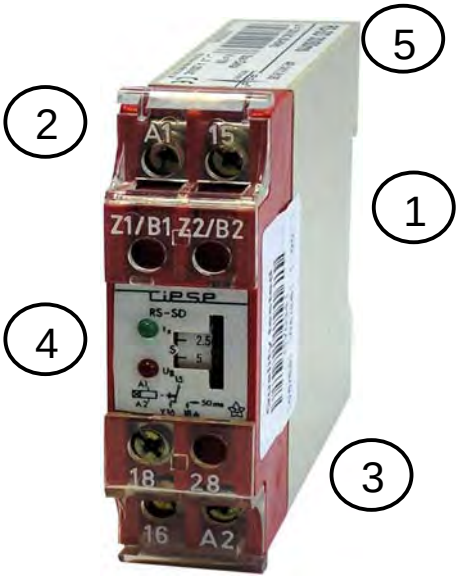


Contact diagram



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.
4. + Visual switching state and voltage supply indication by means of LED (not on RS-VR).
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 scenarious 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 it's two plants in Horb, Baden-Württemberg and Zeulenroda,Thuringia.
(Prizes: e.g. "Most innovative medium-sized company of the year 1979")