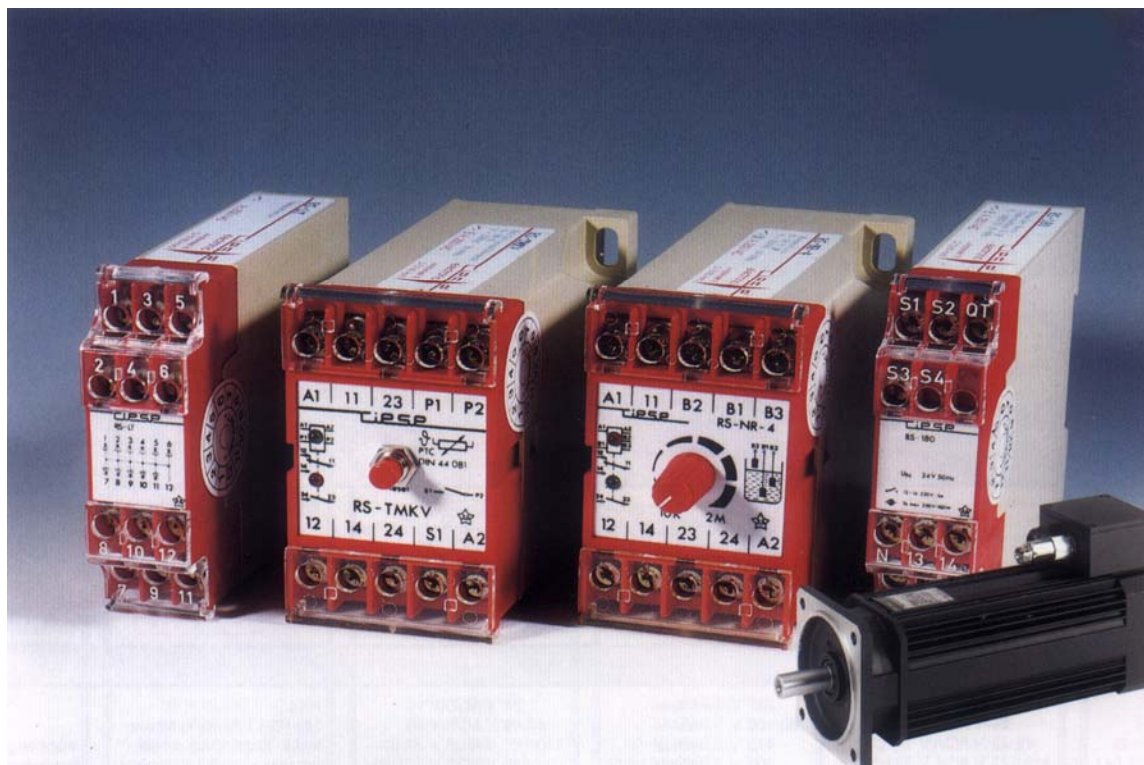










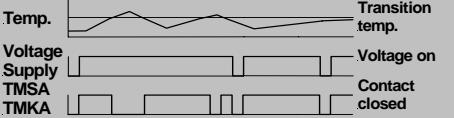
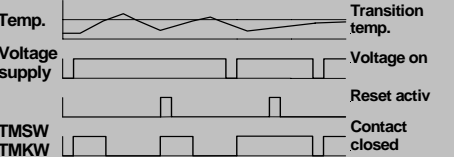
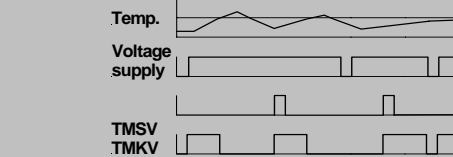
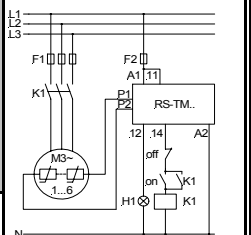
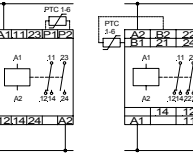
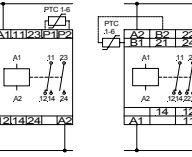
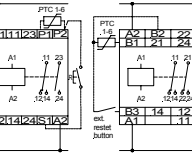
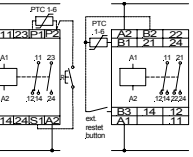
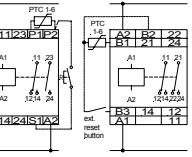
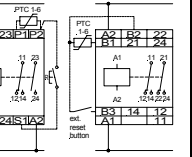
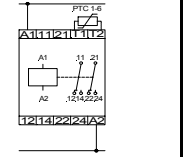
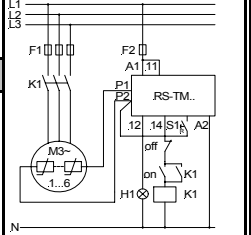


Measuring relays from riese




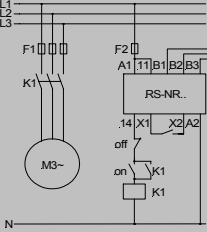
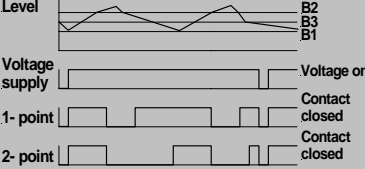
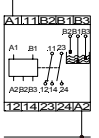
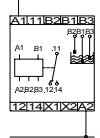
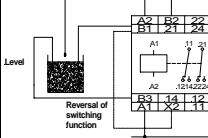


Applications	Relay designations (all with CE)	Column	EN 954 safety class
PTC-resistor release relays	RS-TMSA, RS-TMSA-2	1	1
	RS-TMKA, RS-TMKA-2	2	1
	RS-TMSW, RS-TMSW-2	3	1
	RS-TMKW, RS-TMKW-2	4	1
	RS-TMSV, RS-TMSV-2	5	1
	RS-TMKV, RS-TMKV-2	6	1
	PTC-resistor release relay in 22.5 mm housing RS-TMVW	8 7	1 1
Level relays	RS-NR4, RS-NRU-4 RS-NR2	9,10 11	1, 1 1
Current relays	RS-185-4, RS-186-4 RS-187-4, RS-188-4	12, 13 14, 15	1, 1 1, 1
Voltage relays	RS-190-4, RS-191-4 RS-192-4, RS-193-4	16, 17 18, 19	1, 1 1, 1
Phase relays	RS-PH1-4	20	1
Industrial relay (High frequency switching)	RS-IR2	21	1





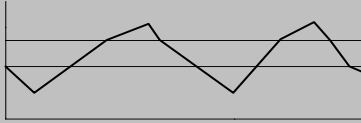

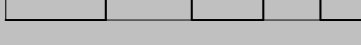
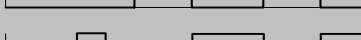

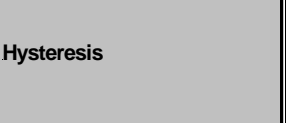




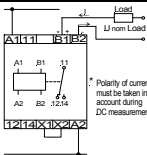
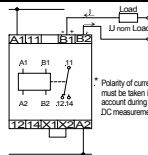
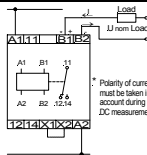
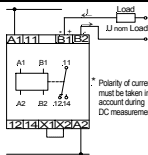
PTC-resistor release relay

								
Type	RS-TMSA, RS-TMSA-2	RS-TMKA, RS-TMKA-2	RS-TMSW, RS-TMSW-2	RS-TMKW, RS-TMKW-2	RS-TMSV, RS-TMSV-2	RS-TMKV, RS-TMKV-2	RS-TMVW	RS-TM...-2
Function/ output contact	PTC-resistor release relay RS-TMSA:1 change-over contact 1 normally close contact RS-TMSA-2: 2 change-over contacts	PTC-resistor release relay RS-TMKA: 1 change-over contact 1 normally close contact RS-TMKA-2: 2 change-over contacts	PTC-resistor release relay RS-TMSW: 1 change-over contact 1 normally close contact RS-TMSW-2: 2 change-over contacts	PTC-resistor release relay RS-TMKW: 1 change-over contact 1 normally close contact RS-TMKW-2: 2 change-over contacts	PTC-resistor release relay RS-TMSV: 1 change-over contact 1 normally close contact RS-TMSV-2: 2 change-over contacts	PTC-resistor release relay RS-TMKV: 1 change-over contact 1 normally close contact RS-TMKV-2: 2 change-over contacts	PTC-resistor release relay RS-TMVW: 2 change-over contact	The preceding six PTC-resistor release relays (see cols 1-6) are now also available in a 22.5 mm housing (see cols 1-6)!
Basic wiring diagram/ pulse schedule	see col. 8 Basic wiring diagram 1 		see col. 8 Basic wiring diagram 2 		see col. 8 Basic wiring diagram 2 		Basic wiring diagram 1 	
Wiring diagram								Basic wiring diagram 2 
LED	2 LED	2 LED	2 LED	2 LED	2 LED	2 LED	2 LED	
Voltage supply	24 V AC/DC * 24 V AC 42-48 V AC 110-127 V AC 230 V AC * without electrical isolation	24 V AC/DC * 24 V AC 42-48 V AC 110-127 V AC 230 V AC * without electrical isolation	24 V AC/DC * 24 V AC 42-48 V AC 110-127 V AC 230 V AC * without electrical isolation	24 V AC/DC * 24 V AC 42-48 V AC 110-127 V AC 230 V AC * without electrical isolation	24 V AC/DC * 24 V AC 42-48 V AC 110-127 V AC 230 V AC * without electrical isolation	24 V AC/DC * 24 V AC 42-48 V AC 110-127 V AC 230 V AC * without electrical isolation	24 V AC/DC * 24 V AC 42-48 V AC 110-127 V AC 230 V AC * without electrical isolation	
other attributes	Zero-voltage protection: no Restart inhibitor: no Short-circuit monitoring: no RS-TMSA: 45 mm housing RS-TMSA-2: 22.5 mm housing	Zero-voltage protection: no Restart inhibitor: no Short-circuit monitoring: yes RS-TMKA: 45 mm housing RS-TMKA-2: 22.5 mm housing	Zero-voltage protection: no Restart inhibitor: yes Short-circuit monitoring: no RS-TMSW: 45 mm housing RS-TMSW-2: 22.5 mm housing	Zero-voltage protection: no Restart inhibitor: yes Short-circuit monitoring: yes RS-TMKW: 45 mm housing RS-TMKW-2: 22.5 mm housing	Zero-voltage protection: yes Restart inhibitor: yes Short-circuit monitoring: no RS-TMSV: 45 mm housing RS-TMSV-2: 22.5 mm housing	Zero-voltage protection: yes Restart inhibitor: yes Short-circuit monitoring: yes RS-TMKV: 45 mm housing RS-TMKV-2: 22.5 mm housing	Zero-voltage protection: yes Restart inhibitor: yes Short-circuit monitoring: yes	
Method of operation	<p>These are temperature monitoring relays complying to DIN 44081. They are suitable for connecting to conventional PTC-resistors complying to DIN 44081 (60-180°C). When applying an exciting voltage to terminals A1 and A2 the device is ready for operation. The PTC-resistor temperature sensors are connected to terminals P1 and P2 (T1 and T2 in the case of RS-TMVW). Six temperature sensors can be connected in series, sum of cold resistance <=1.5 K Ω. The devices function according to the close circuit current principle and hence monitor themselves, also with respect to wire breakages, and for types RS-TMKA, RS-TMKA-2, RS-TMKV, RS-TMKV-2, RS-TMKW, RS-TMKW-2 and RS-TMVW short-circuits in the sensor line (R<20 Ω) as well.</p> <p>A short-circuit causes the same function as a heating of the sensor above the nominal cut-out temperature (thermal release). The max. voltage which can be applied to the sensor is 7.5 V. The test circuit is electrically isolated from the voltage supply, the transformer which is used is manufactured according to VDE 0551. In case of low sensor resistance, the output relay is triggered via IC amplifier, the contacts 11-14 and 23-24 (for 45 mm devices) or 11-14 and 21-24 (for 22.5 mm devices) are closed. Thermal release (high sensor resistance): if the nominal cut-out temperature is reached, the output relay drops out, the contacts 11-14 and 23-24 (for 45 mm devices) or 11-14 and 21-24 (for 22.5 mm devices) are opened. The pick up resistance of the device is 3 K with a tolerance +/- 7°C. The release value (switching hysteresis) is the "pick-up value - 10%". Depending on the type you have the relays can be reset as follows:</p> <ul style="list-style-type: none">- Without restart inhibitor / automatic restart (RS-TMSA.../RS-TMKA...): The restart after the PTC-resistor has cooled down under the nominal cut-out temperature happens automatically.- With restart inhibitor / non zero voltage proof (RS-TMSW.../RS-TMKW...): A restart is only possible -after the PTC-resistor has cooled down under the nominal cut-down temperature and by pressing the integrated or external reset button, or -after the PTC-resistor has cooled down under the nominal cut-down temperature and by a short disconnection of the voltage supply.- With restart inhibitor / non zero voltage proof (RS-TMSV.../RS-TMKV.../RS-TMVW): A restart is only possible after the PTC-resistor has cooled down under the nominal cut-down temperature and by pressing the integrated or external reset button. If there is a power failure following a thermal release, then upon restoration of the power supply the restart remains inhibited via the non-volatile permanent memory. Therefore, the devices comply to VDE 0113, sect. 5.4.2, which guarantees that automatic restarts of machines after a release and a power failure are impossible. Only in case of a power failure and restoration of the power supply without a release taking place the devices are operative again. The exciting voltage must be applied for a reset. <p>Only RS-TM...-2: the exact type designation is evidently on the side label.</p>							
Column	1	2	3	4	5	6	7	8





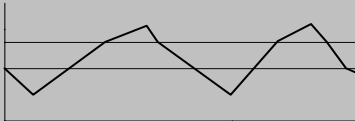






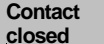
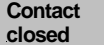
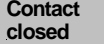
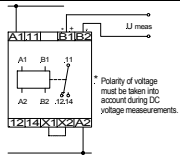
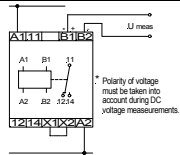
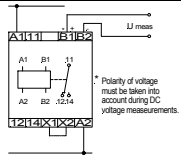
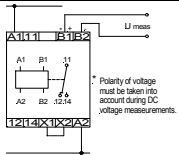
Level relay

			
Type	RS-NR-4	RS-NRU-4	RS-NR2
Function/ output contact	Level relay RS-NR-4 1 change-over contact 1 normally closed contact	Level relay RS-NRU-4 1 change-over contact	Level relay RS-NR2 2 change-over contacts
Basic wiring diagram/ pulse schedule	<div>Function diagram, level relays</div> <div>Basic wiring diagram, level relays</div>  <div>Level</div>  <div>Voltage supply</div> <div>1- point</div> <div>2- point</div> <div>Level</div> <div>B2</div> <div>B3</div> <div>B1</div> <div>Voltage on</div> <div>Contact closed</div> <div>Contact closed</div>		
Wiring diagram			
LED	2 LED	2 LED	2 LED
Voltage supply	24 V AC 42-48 V AC 110-127 V AC 230 V AC	24 V AC 42-48 V AC 110-127 V AC 230 V AC	24 V AC 42-48 V AC 110-127 V AC 230 V AC
other attributes	Switchable Reversal of switching function: no Resistance ranges: 1 K - 100 KΩ 10 K - 2 MΩ	Switchable Reversal of switching function: yes Resistance ranges: 1 K - 100 KΩ 10 K - 2 MΩ	Switchable Reversal of switching function: yes Resistance ranges: 1 K - 100 KΩ 10 K - 2 MΩ
Method of operation	<p>These NR devices are level relays for monitoring the levels of conductive liquids. During operation of the devices the exciting voltage must be applied to terminal A1 and A2. Single terminal electrodes are used for recording measured values. The test circuit of the electronic control is electrically isolated from the power supply. The transformer which is used is manufactured according to VDE 0551. Electrode current 10 mA, electrode voltage 18 V AC. The delay on energizing and the drop-out time are both 0.6 s.</p> <p><u>1-point control</u></p> <p>The reference electrode or conductive vessel wall is connected to terminal B1. The maximum electrode is connected to terminal B2. If the maximum electrode is not moistened by liquid the output relay return to its basic position. If you have the version RS-NRU-4 and RS-NR2 the terminals B1-X2 have to be bridged.</p> <p><u>2-point control</u></p> <p>The devices are connected like the 1-point control with an additional electrode (minimum electrode) connected to terminal B3. If the maximum electrode is moistened by liquid the output relay returns to its basic position. When the minimum electrode is no longer moistened by the liquid the output relay attracts again. If you have the version RS-NRU-4 the terminals X1-X2 must be bridged if you have version RS-NR2 terminals B1-X2 must be bridged.</p> <p>Without the jumper the function of the relay is reversed.</p>		
Column	9	10	11

Current relay

				
Type	RS-185-4	RS-186-4	RS-187-4	RS-188-4
Function/ output contact	Current relay 1 change-over contact	Current relay 1 change-over contact	Current relay 1 change-over contact	Current relay 1 change-over contact
Basic wiring diagram/ pulse schedule	<div><div><div>Current</div></div><div><div>Voltage supply</div></div><div><div>Output with jumper X1-X2</div></div><div><div>Output with energization suppression</div></div><div><div>Output without jumper X1-X2</div></div></div> <div><div>Hysteresis</div></div> <div><div>Voltage on</div></div> <div><div>Contact closed</div></div> <div><div>Contact closed</div></div> <div><div>Contact closed</div></div>			
Wiring diagram				
LED	2 LED	2 LED	2 LED	2 LED
Voltage supply	24 V AC/DC * 24 V AC 42-48 V AC 110-127 V AC 230 V AC * without electrical isolation	24 V AC/DC * 24 V AC 42-48 V AC 110-127 V AC 230 V AC * without electrical isolation	24 V AC/DC * 24 V AC 42-48 V AC 110-127 V AC 230 V AC * without electrical isolation	24 V AC/DC * 24 V AC 42-48 V AC 110-127 V AC 230 V AC * without electrical isolation
other attributes	Energization suppression: yes (approx. 8 s) Adjustable hysteresis: yes (5-50%)	Energization suppression: yes (approx. 8 s) Adjustable hysteresis: no hysteresis fixes (10%)	Energization suppression: no Adjustable hysteresis: yes (5-50%)	Energization suppression: no Adjustable hysteresis: no, hysteresis fixed (10%)
	<div><div>current range:</div><div>2 - 20 mA 10 - 100 mA 0.1 - 1 A 0.3 - 3 A 0.5 - 5 A 1 - 10 A</div></div> <div><div>Input resistance:</div><div>2.5 Ω 500 mΩ 50 mΩ 16 mΩ 10 mΩ 5 mΩ</div></div> <div><div>Overload capacity</div><div>continuous duty, max. 3 s 400 mA 600 mA 1 A 2 A 3.5 A 7 A 7 A 15 A 12 A 25 A 18 A 36 A</div></div>			
Method of operation	<p>These devices are current relays for monitoring AC or DC. They can be used for various control and monitoring tasks in electrical systems, e.g. overload protection for electric drivers, valves, welding equipment, emergency power supplies as well as other electrical loads and generators.</p> <p>When applying an exciting voltage to terminal A1 and A2 the devices are ready for operation. The input circuit is connected to terminal B1 and B2. In case of DC monitoring you have to take care of the polarity (+ B1, - B2). The industrial relay function can be programmed via a jumper X1-X2. When a jumper is fitted, the output relay is in the off position, i.e. the relay attracts in case of an excess current. Without a jumper the function is reversed.</p> <p>The value to be set at the current relay is related to:</p> <ul style="list-style-type: none">- the direct current applied to B1/B2 in case of DC- the effective value of the sine-wave alternating current applied to B1/B2 for AC measurements. <p>The types RS-185-4 and RS-187-4 have an additional energization suppression. The energization currents, which can reach several times the nominal value, are suppressed following an interruption in the power supply or upon switching on the device. They do not lead to a malfunction for a periode of 8 s.</p> <p>With types RS-185-4 and RS-187-4, the switching point hysteresis can be varied between 5 and 50 % of the value of the current set at the device. With types RS-186-4 and RS-188-4, with non-adjustable hysteresis, this is approx. 10 %.</p> <p>The on and off delay is approx. 0.1 s. Devices with 24 V AC/DC exciting voltage have no electrical isolation in the device. Therefore, the test current source must be electrically isolated from the supply source.</p>			
Column	12	13	14	15

Voltage relay

				
Type	RS-190-4	RS-191-4	RS-192-4	RS-193-4
Function/ output contact	Voltage relay 1 change-over contact	Voltage relay 1 change-over contact	Voltage relay 1 change-over contact	Voltage relay 1 change-over contact
Basic wiring diagram/ pulse schedule	<div><div><div>Voltage level</div></div><div><div>Voltage supply</div></div><div><div>Output with jumper X1-X2</div></div><div><div>Output with energization suppression</div></div><div><div>Output without jumper X1-X2</div></div></div> <div><div>Hysteresis</div></div> <div><div>Voltage on</div></div> <div><div>Contact closed</div></div> <div><div>Contact closed</div></div> <div><div>Contact closed</div></div>			
Wiring diagram				
LED		2 LED	2 LED	2 LED
Voltage supply	24 V AC/DC * 24 V AC 42-48 V AC 110-127 V AC 230 V AC * without electrical isolation	24 V AC/DC * 24 V AC 42-48 V AC 110-127 V AC 230 V AC * without electrical isolation	24 V AC/DC * 24 V AC 42-48 V AC 110-127 V AC 230 V AC * without electrical isolation	24 V AC/DC * 24 V AC 42-48 V AC 110-127 V AC 230 V AC * without electrical isolation
other attributes	Energization suppression: yes (approx. 8 s) Adjustable hysteresis: yes (5-50%)	Energization suppression: yes (approx. 8 s) Adjustable hysteresis: no hysteresis fixes (10%)	Energization suppression: no Adjustable hysteresis: yes (5-50%)	Energization suppression: no Adjustable hysteresis: no, hysteresis fixed (10%)
	<div><div>Test voltage range:</div><div>1 - 10 V 3 - 30 V 6 - 60 V 15 - 150 V 25 - 250 V</div><div>Input resistance:</div><div>1 MΩ 1 MΩ 1 MΩ 1 MΩ 1 MΩ</div><div>Max. overvoltage strength, cont. duty:</div><div>700 V 700 V 700 V 700 V 700 V</div></div>			
Method of operation	<p>These devices are voltage relays for monitoring AC or DC voltages. They can be used for various control and monitoring tasks in electrical systems, e.g. over- or undervoltage protection for electric drivers, valves, welding equipment, emergency power supplies as well as other electrical loads and generators. These voltage relays can also be employed as motor standstill automatic controllers. The inverse voltage is measured when the motor is switched off. The device signals stands still when the inverse voltage generates drop to the set values, depending on the setting of jumper X1-X2.</p> <p>When applying an exciting voltage to terminal A1 and A2 the devices are ready for operation. The input voltage circuit is connected to terminal B1 and B2. The polarity must be taken into account in case of DC voltage monitoring (+ B1, - B2). The industrial relay function can be programmed via a jumper X1-X2. When a jumper is fitted, the output relay is in the off position, i.e. the relay attracts in case of an excess voltage. Without a jumper the function is reversed.</p> <p>The value to be set at the voltage relay is related to:</p> <ul style="list-style-type: none">- the DC voltage applied to B1/B2 in case of DC measurement,- the effective value of the sine-wave AC voltage applied to B1/B2 for AC voltage. <p>the types RS-190-4 and RS-191-4 have an additional energization suppression. The energization voltage are suppressed following an interruption in the power supply or upon switching on the device. They do not lead to malfunctioning for a period of 8 s.</p> <p>With the types RS-190-4 and RS-192-4, the switching point hysteresis can be varied between 5 and 50% of the set value of the current.</p> <p>With the types RS-191-4 and RS-193-4 with non-adjustable hysteresis, this is approx. 10%</p> <p>The on and off delay is approx. 0.1 s. Devices with 24 V AC/DC exciting voltage have no electrical isolation in the device between exciting voltage connection and test voltage. Therefore, the test-voltage source must be electrically isolated from the supply voltage source.</p>			
Column	16	17	18	19

Phase sequence relay



Type

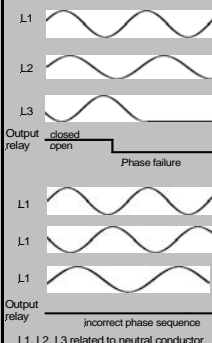
RS-PH1-4

**Function/
output
contact**

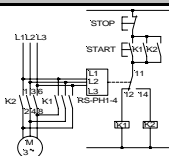
Phase sequence relay

1 change-over contact

**Basic wiring
diagram/
pulse schedule**



**Wiring
diagram**



LED

**Voltage
supply**

230 V, 3 ~
380-400 V, 3 ~
440 V, 3 ~
500 V, 3 ~
550 V, 3 ~

**other
attributes**


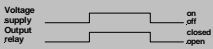
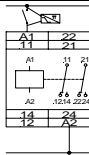
This device monitor controls a 3 phase net for correct phase sequences and total failure of the phases. It operates according to the closed-circuit current principle and hence monitors itself. Therefore, it is guaranteed that in case of a malfunction of the system it will shut down save. If all phases are in the right position the output relay puts through, the contact 11-14 is closed. In case of incorrect phase or phase failure the relay drops out. The contact 11-12 is closed. Even a faulty fuse is recognized as a phase failure, if no voltage is fed back to the measuring relay by the user. The pick-up time in the case of an incorrect phase position is 70 ms, the drop-out time 40 ms. The air gaps and leakage paths of the test circuit were sized according to the VDE 0110C, 550 V AC, those of the output circuit designed according to VDE 0110C, 250 V AC.

**Method of
operation**


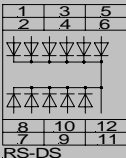
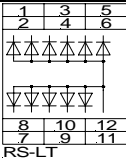
Column

20

Industrial relay

	
Type	RS-IR1
Function/ output contact	Industrial relay high frequency switching 2 change-over contacts
Basic wiring diagram/ pulse schedule	
Wiring diagram	
LED	1 LED
Voltage supply	24 V AC* 42-48 V AC* 110-127 V AC* 230 V AC* * without electrical isolation
other attributes	Initiator connection: yes
Method of operation	This device is an industrial relay for high switching frequencies. The pick-up and drop-out time is less than 10 ms. After applying the supply voltage to terminals A1 and A2 this industrial relay attracts immediately. If the supply voltage A1 and A2 is interrupted, the industrial relay returns to its basic position.
Column	21

Diode gate

		
Type		RS-LT / RS-DS
Function/ output contact		RS-LT: Diode gate, lamp tester for simultaneous testing of 11 warning lamps.
Basic wiring diagram/ pulse schedule		RS-DS: Diode gate, diode fault indicator for detecting 11 separate signals and passing them on via a collective line. 
Wiring diagram		
LED		
Voltage supply		
other attributes		RS-LT: The RS-LT device is a lamp tester. Warning lamps only possess a limited lifetime; therefore, they have to be checked regularly to ensure that they are working. Tests showed that using the RS-LT lamp tester enables to check the function of totally 11 warning lamps. By connecting RS-LT in parallel, the number of warning lamps to be tested can be extended to any number. In case of AC power the lamps only illuminate with reduced intensity.
Method of operation		RS-DS: The RS-DS device is a diode fault indicator. It can be used to combine up to 11 fault indications from various signals. The cumulative fault warning lamp, which has to be connected to terminal 12, illuminates as soon as the fault is registered. The cumulative fault warning lamp or the connected industrial relay, e.g. RS-IR-2, remains on until the contact triggering the fault signal has opened. These devices are available with a purchase quantity of 100+ per year. For more information please contact riese-electronic.
Column		22

Technical specifications

Dimensions	(of different housings and terminals)
Voltage drift	+/- 0.001 % / % ΔU (CMOS technology)
	+/- 0.2 % / % ΔU (transistor technology)
	+/- 0.1 % / % ΔU only for RS-185-4/188-4 and RS-190-4/193-4
	for RS-TM.... 0.5 Ohm / % ΔU .
Temperature drift	+/- 0.15 % / °C (transistor technology for RS-TM... +/- 10hm/°C)
Repeat accuracy	+/- 0.2 %
Setting accuracy at end of scale	+/- 4 %
Power consumption	2.5 - 3 VA
Voltage tolerance range	0.85 - 1.1 Unom
Duty cycle	100 % continuous
Max. continuous current	10 A AC 1 change-over contact
	5 A AC 2 change-over contact
	1 A DC
Max. switching voltage	250 V AC, 50..60 Hz, 250 V DC
Max. switching rate	6000 operations/h
Electrical life on load	see diagram
Mechanical life	3x10 ⁷ operations
Contact material	silver cadmium oxide 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. 32Hz
Test voltage	2500 V, 50 Hz
Standards	to DIN VDE 0435
Leakage paths / Air gaps	DIN VDV 0110-1, DIN EN 50178, degree of pollution 2, category of overvoltage 3
Operation position	no restriction
Weight	approx. 120 g for 22.5 mm housing
	approx. 250 g for 45 mm housing
Class of protection	DIN VDE 0470-1, According to DIN VDE 0470-1, IP 20, finger-touch and back-of-hand-touch protection to VDE 0106/100 as well as VBG4
Conductor	2x1.5 mm ² massive wire
	2x0.5 mm ² strand with hull DIN 46228
Mounting dimensions	to DIN EN 50022
Terminal markings	to DIN EN 40050
Visual switching state (green) and voltage supply (red); vice versa RS-TM...	
Initiator connection (RS-IR2) controllable with contact or 2-wire-proximity switch with residual current < 4 mA.	
Exciting voltage without electrical isolation in 22.5 mm housing, with electrical isolation, between inputs and power supply (except for 24 V AC/DC and RS-PH1-4).	
With the RS-NR2 and RS-TM...-2 next to each other and not in the climatic cabinet and with overvoltage supply at longer time: please keep distance between both devices >= 5 mm.	

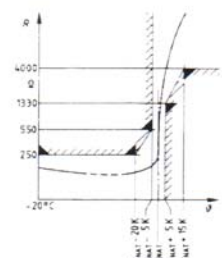
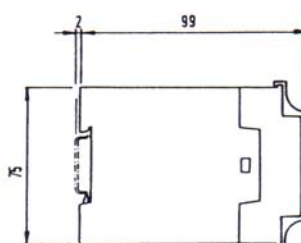
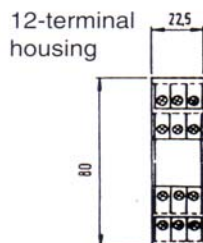
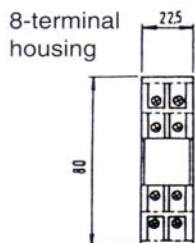
We reserve the right to make changes to technical specification.

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

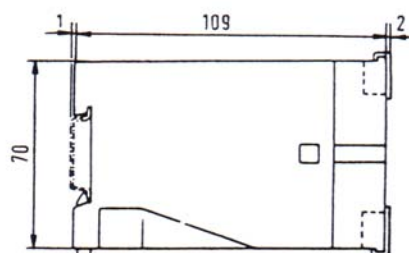
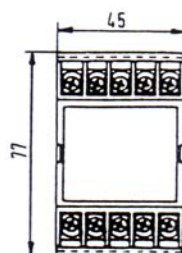
Release 2007

Dimensions

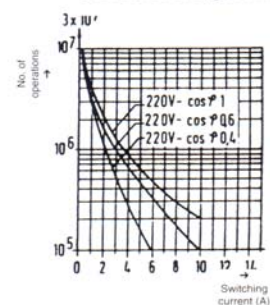
Diagram of a PTC according to DIN 44081



Dimension



Contact diagram



Product features:

1. + Mounting on standard 35mm rails to DIN 46 277 by means of snap-on fixings.
+ Possibility of additional screw fixings for 45mm housings.
2. + Connection 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 proofed.
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.
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.

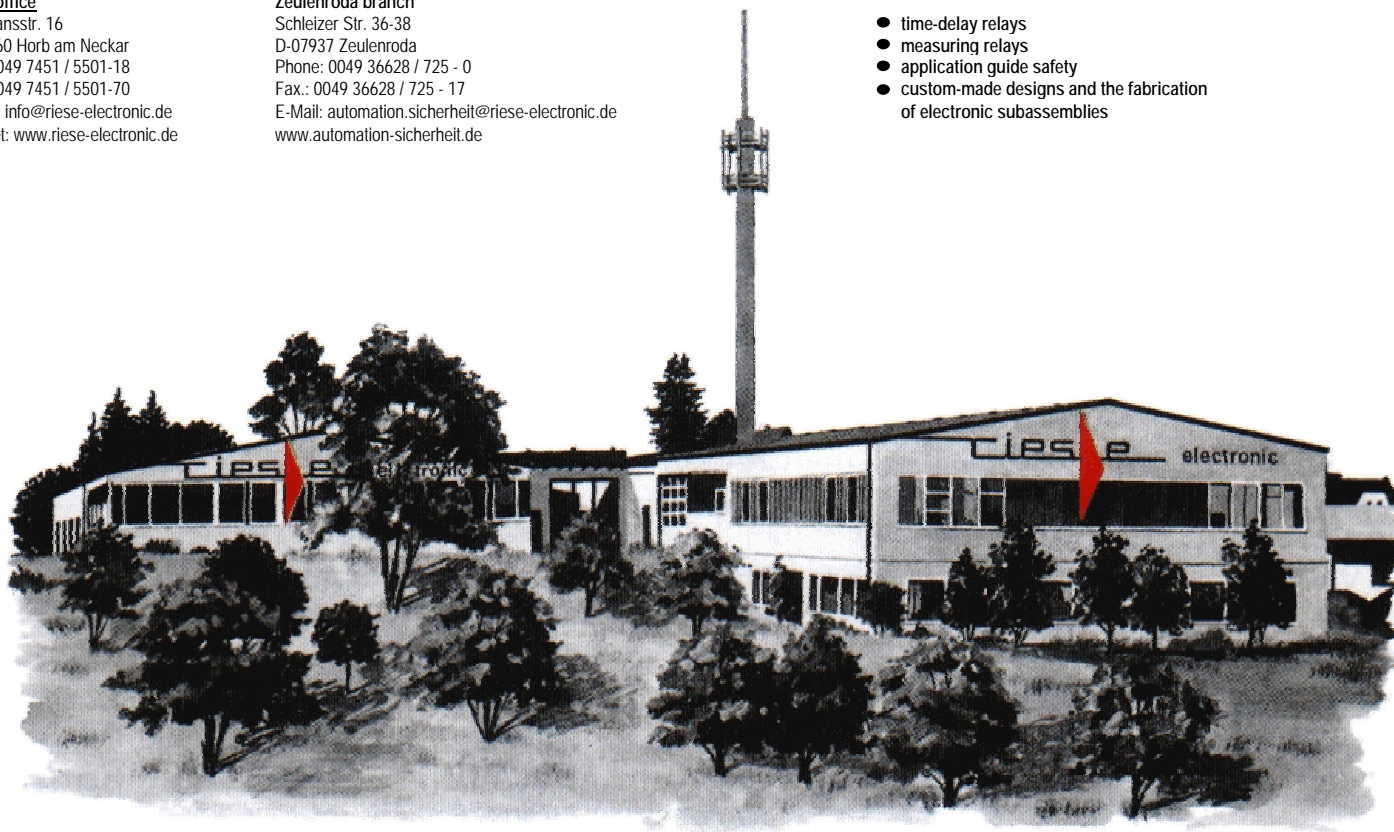
(Prizes: e.g. "Most innovative medium-sized company of the year 1979")

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Please ask for additional information on:

- time-delay relays
- measuring relays
- application guide safety
- custom-made designs and the fabrication of electronic subassemblies



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