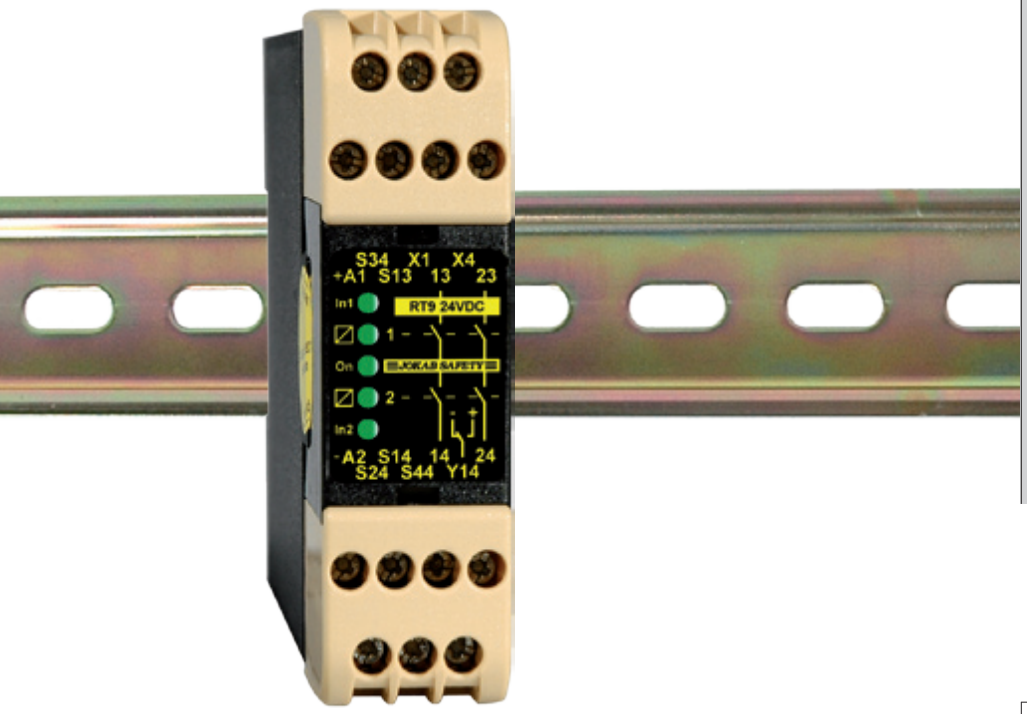
Safety relay RT9



Approvals:

Safety relay for:

- Emergency stops
- Light curtains
- Three position devices
- Interlocked gates/hatches
- Magnetic switches
- Light beams
- Safety mats
- Contact strips
- Foot operated switches

Features:

- Five input options
- Single or dual channel input
- Manual supervised or automatic reset
- Test input for supervision of external contactors
- Width 22.5 mm
- LED indication of supply, inputs and outputs, short-circuit and low voltage level
- 2 NO relay outputs
- One changeover relay with a double information output
- Supply 24 VDC
- Quick release connector blocks

Would you like a small safety relay for all your safety applications?

Then choose the compact RT9 universal relay to supervise both your safety devices and the internal safety of your machinery. In addition, you can select the safety level that is required for each installation. All this is possible due to the RT9 offering the most versatile input option arrangement available on the market. The RT9 can therefore replace many other relays.

Other RT9 options include selection of either manual supervised or automatic resetting. The manual supervised reset can be used for gates and other safety devices that can be bypassed. Automatic reset can be used for small safety hatches, if deemed acceptable from risk assessment.

In addition, the RT9 has a double information output that will indicate e.g if a gate is open or if the relay needs resetting.

The RT9 uses the latest component technology and modern assembly techniques to ensure a highly cost effective solution.

Choose the RT9 to simplify your safety circuits and reduce your costs.

Technical information - RT9

Inputs

The RT9 can be configured to operate in either of the following input options:

1. Single channel, 1 NO contact from +24VDC, safety cat. 1.
2. Dual channel, 2 NO contacts from +24VDC, safety cat. 3.
3. Dual channel, 1 NO, 1 NC contact from +24VDC, safety cat. 4.
4. Dual channel, 1 NO contact from 0V and 1 NO contact from +24VDC, safety cat. 4.
5. Safety mat/contact strips, 1 'contact' from 0V and 1 'contact' +24VDC, safety cat. 1.

When the input/inputs are activated and the test/supervised reset is complete, relays 1 and 2 are energised. These are de-energised when the input/inputs are de-activated in accordance with the input option chosen or in case of a power failure.
Relays 1 and 2 must both be de-energized before the RT9 can be reset.

Relay output status information

The RT9 has a changeover contact relay output that can be connected to a PLC, control lamp, computer or similar. The output gives information about the status of the relay.

Reset and testing

The RT9 has two reset options; manual and automatic. The manual supervised reset can be used when the RT9 is monitoring safety devices that can be bypassed, i.e. to ensure that the outputs of the safety relay do not close just because a gate is closed. The automatic reset option should only be used if appropriate from a risk point of view.
Due to special internal circuits the RT9 can be automatically reset regardless of the operational voltage rise time, this being an important factor when large loads are started up on the same power supplies at the same time.

In addition, the RT9 can also test (supervise), if for example, contactors and valves etc are de-energised/de-activated before a restart is made.

Indication of low voltage

The 'On' LED will flash if the relay supply voltage falls below an acceptable level. This indication will also be given if a monitored safety mat/contact strip is actuated. Please see Connection option 5.

Safety level

The RT9 has internal dual and supervised safety functions. Power failure, an internal faulty component or external interference will not present a risk to options with the highest safety level. A manual reset requires that the reset input is closed and opened before the safety relay outputs are activated. A short-circuit or a faulty reset button is consequently supervised.

When the RT9 is configured for dual channel input, both the inputs are supervised for correct operation before the unit can be reset.

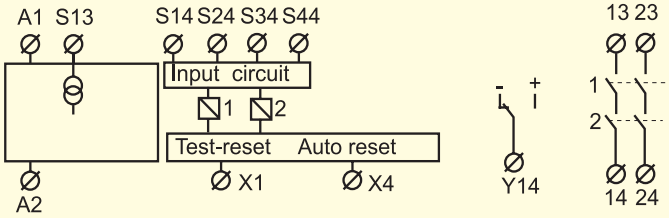
The input options 3 and 4 have the highest safety levels as all short-circuits and power failures are supervised. This in combination with an internal current limitation makes the relay ideal for supervision of safety mats and contact strips.

Regulations and standards

The RT9 is designed and approved in accordance with appropriate directives and standards. Examples of such are 98/37/EC, EN ISO 12100-1/-2, EN 60204-1, EN 954-1/EN ISO 13849-1.

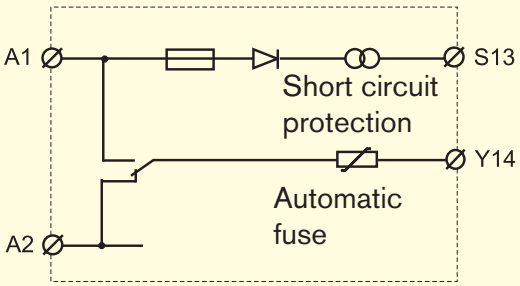
Connection examples

For examples of how our safety relays can solve various safety problems, please see the section "Connection examples".



Connection of supply - RT9

DC supply



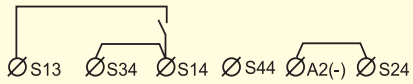
The RT9 should be supplied with +24 V on A1 and 0 V on A2.

NOTE

If cable shielding is used this must be connected to an earth rail or an equivalent earth point.

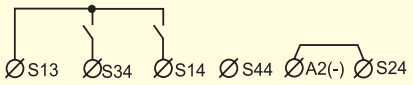
Connection of safety devices - RT9

1. SINGLE CHANNEL, 1 NO from +24V



The input (contact to S14) must be closed before the outputs can be activated. When the input contact is opened, the relay safety output contacts open.

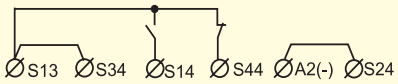
2. DUAL CHANNEL, 2 NO from +24V



Both input contacts (S14 and S34) must be closed before the relay outputs can be activated. The safety relay contacts will open if one or both of the input contacts are opened. Both the input contacts must be opened and reclosed before the relay can be reset.

A short-circuit between inputs S14 and S34 can only be supervised if the device connected to the inputs has short-circuit supervised outputs, e.g. JOKAB Focus light curtains

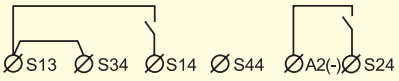
3. DUAL CHANNEL, 1 NO, 1 NC from +24V



One input contact must be closed (S14) and one opened (S44) before the relay outputs can be activated.

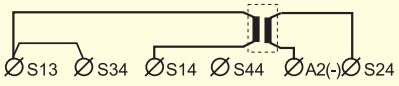
The safety relay contacts will open if one or both of the inputs change state or in case of a short-circuit between S14 and S44. Both inputs must be returned to their initial status before the relay outputs can be reactivated.

4. DUAL CHANNEL, 1 NO from +24V, 1 NO from 0V



Relay functions as option 2, but a short-circuit, in this case between inputs S14 and S24 is supervised (safety outputs are opened).

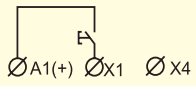
5. Safety mat/Contact strip



Both 'contact' inputs from a inactivated safety mat/contact strip must be made in order to allow the RT9 relay outputs to be activated. When the safety mat/contact strip is activated or a short-circuit is detected across S14-S23, the relay will de-energize (safety contacts open) and the 'ON' LED will flash. As output S13 has an internal current limit of 70 mA, the RT9 will not be overloaded when the mat/contact strip is activated or a short-circuit is detected.

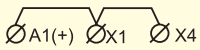
Reset connections - RT9

Manual supervised reset



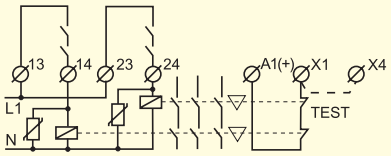
The manual supervised reset contact connected to input X1 must be closed and opened in order to activate the relay outputs.

Automatic reset



Automatic reset is selected when A1(+), X1 and X4 are linked. The relay outputs are then activated at the same time as the inputs.

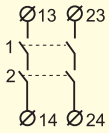
Testing external contactor status



Contactors, relays and valves can be supervised by connecting 'test' contacts between A1(+) and X1. Both manual supervised and automatic reset can be used.

Output connections - RT9

Relay outputs



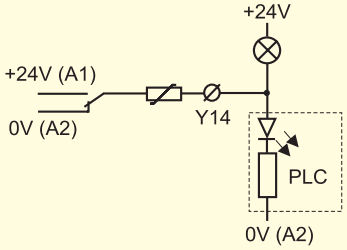
The RT9 has two (2 NO) safety outputs.

In order to protect the output contacts it is recommended that loads (inductive) are suppressed by fitting correctly chosen VDR's, diodes etc. Diodes are the best arc suppressors, but will increase the switch off time of the load.

Information outputs

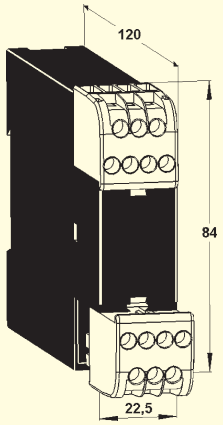
The RT9 has a single changeover contact information relay output.The relay output Y14 is connected internally to 0V and 24V in the following way:

- Y14 is internally closed to 0V when the RT9 is not reset.
- Y14 is internally closed to +24V when the relay is reset.



Technical data - RT9	
Manufacturer	JOKAB SAFETY AB, Sweden
Article number/Ordering data	10-029-00 RT9 24DC
Colour	Black and beige
Weight	210 g
Supply Voltage (A1-A2)	24 VDC +/- 20%
Power consumption Nominal voltage	 2.5 W
Connection S13	Short-circuit protected voltage output, 70 mA +/- 10% current limitation. Is used for the inputs S14, S34 and S44.
Input currents (at nominal supply voltage) S14 (+) input S24 (0V) input S34 (+) input S44 (+) input	 30 mA 20 mA 20 mA 25 mA
Reset input X1 Supply for reset input Reset current Minimum contact closure time for reset Minimum contact closure time (at low limit voltage -20%)	 +24 VDC 300 mA current pulse at contact closure, then 30 mA 80ms 100ms
Maximum external connection cable resistance at a nominal voltage for S14, S24, S34 S44, X1	 300 Ohm 150 Ohm
Response time At Power on When activating (input-output) When deactivating (input–output) At Power Loss	 <100 ms <20 ms <20 ms <80 ms
Relay outputs NO Maximum switching capacity res. load AC Maximum switching capacity res. load DC Max. total switching capacity: Minimum load Contact material Mechanical life	 2 6A/250/1500 VA 6A/24 VDC/150W 8A distributed on all contacts 10 mA/10V (if load on contact has not exceeded 100 mA) Ag+Au flash $>10^7$ operations
Relay information output (Changeover contacts) Y14 - (0V) +(24V) Maximum load of Y14 Short-circuit protection for information output	 Indicates that RT9 is not reset. Indicates that RT9 is reset. 250 mA Internal automatic fuse

LED indication **On** **In1** **In2** **1** **2**	 Supply voltage OK, the LED is on. Flashing light in case of under-voltage, overload or current limiting Indicates that the input conditions are fulfilled. Indicates that the output relays have been activated.
Mounting Rail Operating temperature range	 35 mm DIN rail -10°C to + 55°C
Connection blocks (detachable) Maximum screw torque Maximum connection area: Solid conductors Conductor with socket contact Air and creep distance	 1 Nm 1 x 4mm² / 2 x 1.5mm²/12AWG 1 x 2.5mm² / 2 x 1mm² 4kV/2 IEC 60664-1
Protection class Enclosure Connection blocks	 IP 40 IEC 60529 IP 20 IEC 60529



Connector blocks are detachable (without cables having to be disconnected)