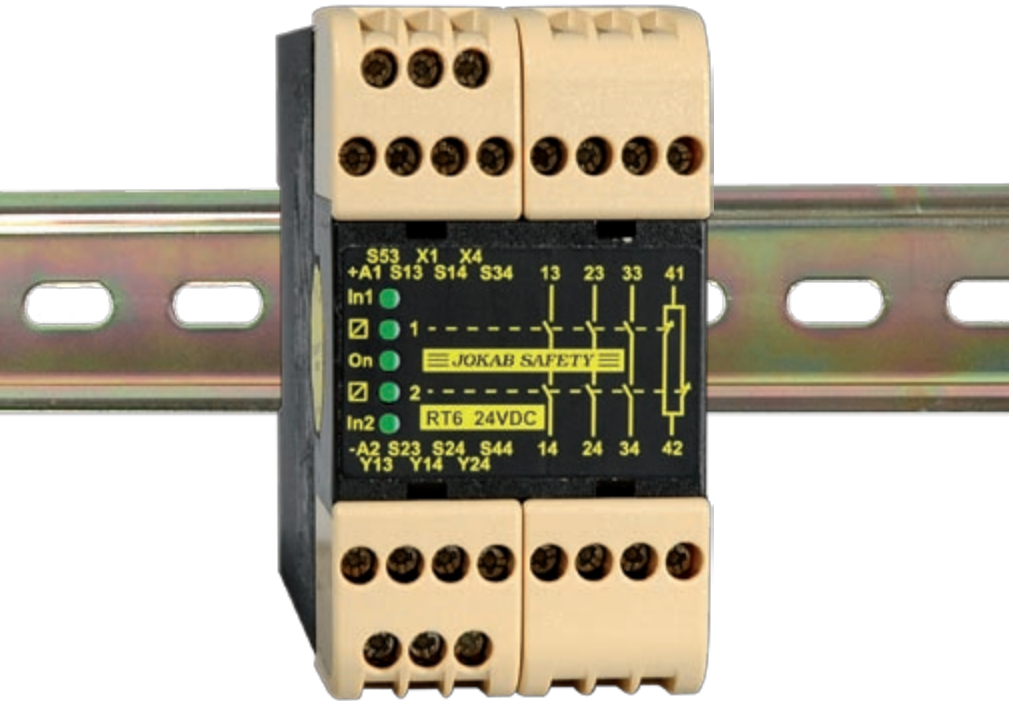
Safety relay
RT6



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

Then choose the RT6 universal relay to supervise both your safety devices and the internal safety of your machinery. In addition you can select the safety level required for each installation. All this is possible because the RT6 has the most versatile input option arrangement available on the market. Many other relays can therefore be replaced by the RT6.

The relay also comes with other options such as manual or automatic reset. Manual supervised reset can be used for gates and other safety devices that can be bypassed. Automatic reset can be used for small hatches, if deemed acceptable from risk assessment.

The RT6 also has information outputs that follow the inputs and outputs of the relay. These outputs will for example indicate if a gate is open or closed and if the safety relay needs to be reset.

The RT6 is designed with a minimum amount of components thus keeping both production costs and component acquisitions to a minimum.

Choose the RT6 to simplify your safety circuits and reduce your costs.

Approvals:

TÜV Nord

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 45 mm
- LED indication of supply, inputs, outputs, short-circuit and low voltage level.
- 3 NO/1 NC relay outputs
- Two voltage free transistor information outputs
- Supply 24 VDC, 24, 48, 115 or 230 VAC
- Quick release connector blocks

Technical information - RT6

Inputs
The inputs from the safety devices must be connected according to one of the following options in order to fulfill the expected safety level and to avoid unsafe situations.

1. Single channel, 1 NO contact from +24 V DC, category 1, up to PL c
2. Dual channel, 2 NO contacts from +24 V DC, category 3, up to PL d
3. Dual channel 1 NO, 1 NC contact from +24 V DC, category 4, up to PL e
4. Dual channel, 1 NO contact from 0V and 1 NO contact from +24 V DC, category 4, up to PL e
5. Safety mats/contact strips 1 'contact' from 0V and 1 'contact' from +24 V DC, category 3, up to PL d

When the input/inputs are activated and the test/supervised reset is complete, relays 1 and 2 are energized. Simultaneous activation is not required where there are dual channels. The two relays are de-energized 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 outputs can be activated again.

Transistor output status information
The RT6 has two voltage free transistor outputs that can be connected to a PLC, computer or other monitoring device. These outputs give the input and output status of the relay.

Reset and testing
The RT6 has two reset options; manual and automatic. The manual supervised reset is used when the RT6 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 should only be used if deemed an acceptable risk.

In addition, the RT6 can also test (supervise) whether, for example, contactors and valves etc are de-energized/de-activated before a restart is allowed.

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. See connection option 5.

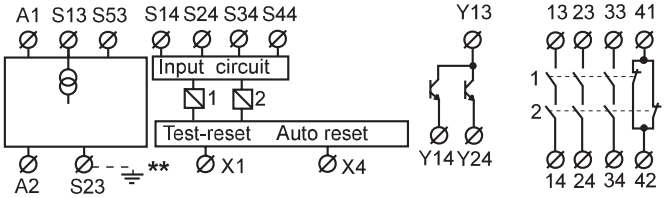
Safety level
The RT6 has internal dual and supervised safety functions. A short-circuit, internal faulty component or external interference will not present a risk to options with the highest safety level. A manual reset requires that the reset input is closed and opened before the safety relay outputs are activated. A short-circuit or a faulty reset button is consequently supervised.

When the RT6 is configured for dual channel input, both the inputs are supervised for correct sequence 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 internal current limitation makes the relay ideal for supervision of safety mats and contact strips.

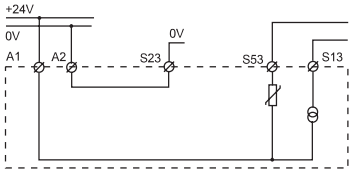
Regulations and standards
The RT6 is designed and approved in accordance with appropriate directives and standards. See technical data.

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

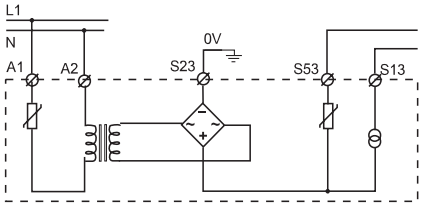


***Only for AC supply*

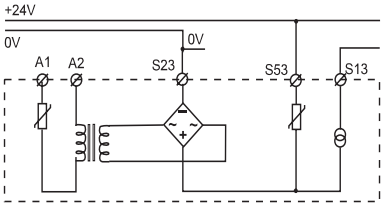
Connection of supply - RT6

DC supply


The RT6 DC option should be supplied with +24 V on A1 and 0 V on A2.

AC supply


The RT6 AC option should be supplied with the appropriate supply voltage via connections A1 and A2.
The S23/ ⏚ must be connected to protective earth.

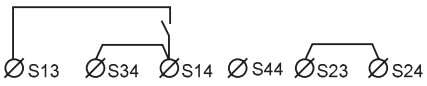
DC-supply of AC-units


All AC-units can also be supplied by +24 VDC to S53 (0VDC to S23).

NOTE!
With both DC and AC modules, if cable shielding is used this must be connected to an earth rail or an equivalent earth point.

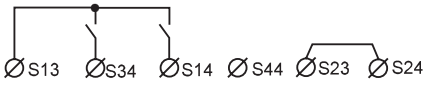
Connection of safety devices - RT6

1. SINGLE CHANNEL, 1 NO from +24V



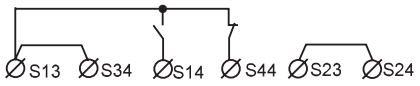
The input (contact to S14) must be closed before the outputs can be activated. When the input contact is opened the relay safety output contacts open.

2. DUAL CHANNEL, 2 NO from +24V



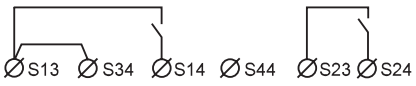
Both input contacts (S14 and S34) must be closed before the relay outputs can be activated. The safety relay contacts will open if one or both of the input contacts are opened. Both the input contacts must be opened and reclosed before the relay can be reset. A short-circuit between inputs S14 and S34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



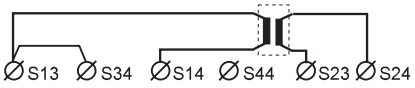
One input contact must be closed (S14) and one opened (S44) before the relay outputs can be activated. The safety relay contacts will open if one or both of the inputs change state or in case of a short-circuit between S14 and S44. Both inputs must return to their initial positions before the relay outputs can be reactivated.

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



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

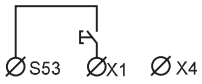
5. Safety mat/Contact strip



Both 'contact' inputs from a inactivated safety mat/contact strip must be made in order to allow the RT6 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 outputs open) and the 'ON' LED will flash. As output S13 has an internal current limit of 70 mA, the RT6 will not be overloaded when the mat/contact strip is activated or a short-circuit is detected.

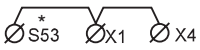
Reset connections - RT6

Manual supervised reset



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

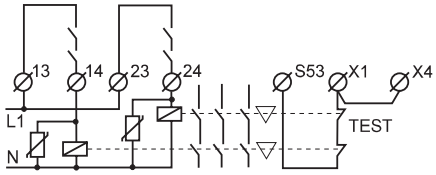
Automatic reset



*connected to S13 for safety mat/ contact strip

Automatic reset is selected when S53, X1 and X4 are linked. The relay outputs are then activated at the same time as the inputs.

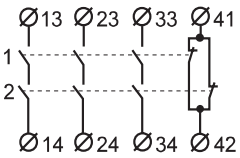
Testing external contactor status



Contactors, relays and valves can be supervised by connecting 'test' contacts between S53 and X1. Both manual supervised and automatic reset can be used.

Output connections - RT6

Relay outputs

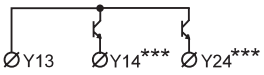


The RT6 has three (3 NO) safety outputs and 1 NC information output.

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.

Transistor outputs



The RT6 has two(2) voltage free transistor outputs for information.

The transistor outputs are supplied with voltage to Y13, either from S53 (+24V) or an external 5-30 VDC supply. Y14 and Y24 follow the relay inputs and outputs as follows:

- Y14 becomes conductive when the relay input conditions are fulfilled.
- Y24 becomes conductive when both the output relays are activated.

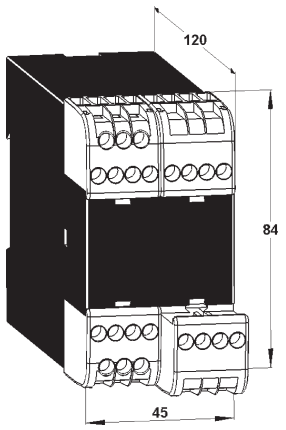
*****NOTE**

These outputs are only for information purposes and must not be connected to the safety circuits of the machinery.

Technical data - RT6

Manufacturer	ABB AB/Jokab Safety, Sweden
Article number/Ordering data	
RT6 24DC	2TLJ010026R0000
RT6 24 AC	2TLJ010026R0200
RT6 115 AC	2TLJ010026R0400
RT6 230 AC	2TLJ010026R0500
Colour	Black and beige
Weight	335 g (24 VDC) 485 g (24-230 VAC)
Supply	
Voltage (A1-A2)	24 VDC +15/-20%, 24/48/115/230 VAC, +15/-10%, 50-60 Hz
Power consumption	
DC supply, nominal voltage	2,3 W
AC supply, nominal voltage	5,2 VA
Connection S13 Short-circuit protected voltage output, 70 mA ± 10% current limitation. Is used for the inputs S14, S34 and S44.	
Connection S53 Short-circuit protected voltage output, internal automatic fuse 270 mA. Is used for the reset and autoreset inputs X1 and X4	
Connection S23 0V connection for input S24	
Safety inputs	
S14 (+) input	20 mA
S24 (0V) input	20 mA
S34 (+) input	20 mA
S44 (+) input	30 mA
Reset input X1	
Supply for reset input	+ 24VDC
Reset current	300 mA current pulse at contact, then 30 mA
Minimum contact closure time for reset	100 ms
Maximum external connection cable resistance at nominal voltage for	
S14, S24, S34	300 Ohm
S44, X1	150 Ohm
Response time	
At Power on DC/AC	<90ms/<220ms
When activating (input-output)	<20 ms
When deactivating (input–output)	<20 ms
At Power Loss	<150 ms
Relay outputs	
NO	3
NC	1
Maximum switching capacity	
Resistive load AC	6A/250 VAC/1500 VA
Inductive load AC	AC15 240VAC 2A
Resistive load DC	6A/24 VDC/150 W
Inductive load DC	DC13 24VDC 1A
Maximum total switching capacity	
Resistive load	12A distributed on all contacts
Minimum load	10mA/10 V (if load on contact has not exceeded 100 mA)
Contact material	Ag+Au flash
Fuses Output (External)	5A gL/gG
Conditional short-circuit current (1 kA)	6A gG
Mechanical life	>10^7 operations

Transistor outputs	Short-circuit proof
External supply to Y13	+5 to +30 VDC
Y14	Indicates that the input conditions have been fulfilled
Y24	Indicates that the output relays are activated
Maximum load of Y14, Y24	15 mA /output
Maximum voltage drop at maximum load	2.4 V
LED indication	
On	Supply voltage OK, the LED is on. Flashing light in case of under-voltage or overload
In1 In2	Indicates that the input conditions are fulfilled.
1 2	Indicates that the output relays are activated.
Mounting	
Rail	35 mm DIN rail
Connection blocks (detachable)	
Maximum screw torque	1 Nm
Maximum connection area:	
Solid conductors	1x4mm²/2x1,5mm²/12AWG
Conductor with socket contact	1x2,5mm²/2x1mm²
Protection class	
Enclosure	IP 40 IEC 60529
Connection blocks	IP 20 IEC 60529
Operating temperature range	-10°C to + 55°C (with no icing or condensation)
Operating humidity range	35% to 85%
Impulse Withstand Voltage	2.5kV
Pollution Degree	2
Performance (max.) The relays must be cycled at least once a year.	Category 4/PL e (EN ISO 13849-1:2008) SIL 3 (EN 62061:2005) PFH_d 9.55E-09
Conformity	2006/42/EC, 2006/95/EC, 2004/108/EC EN 954-1:1996, EN 62061:2005 EN ISO 13849-1:2008



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