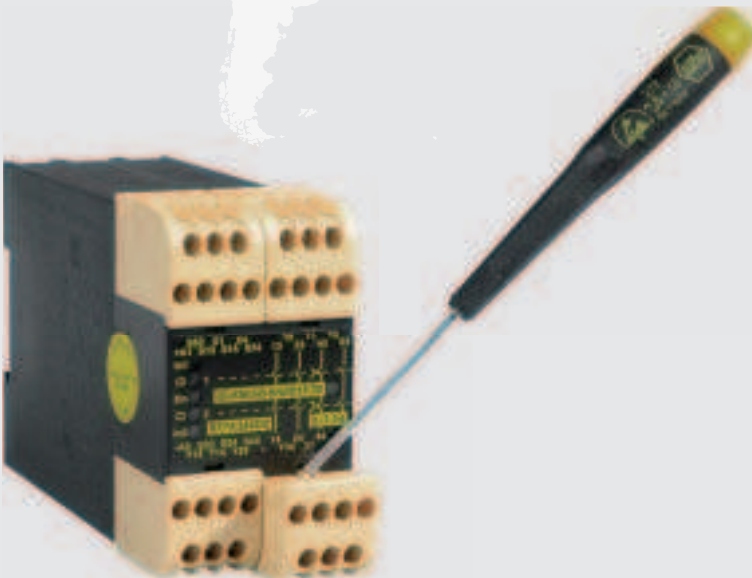
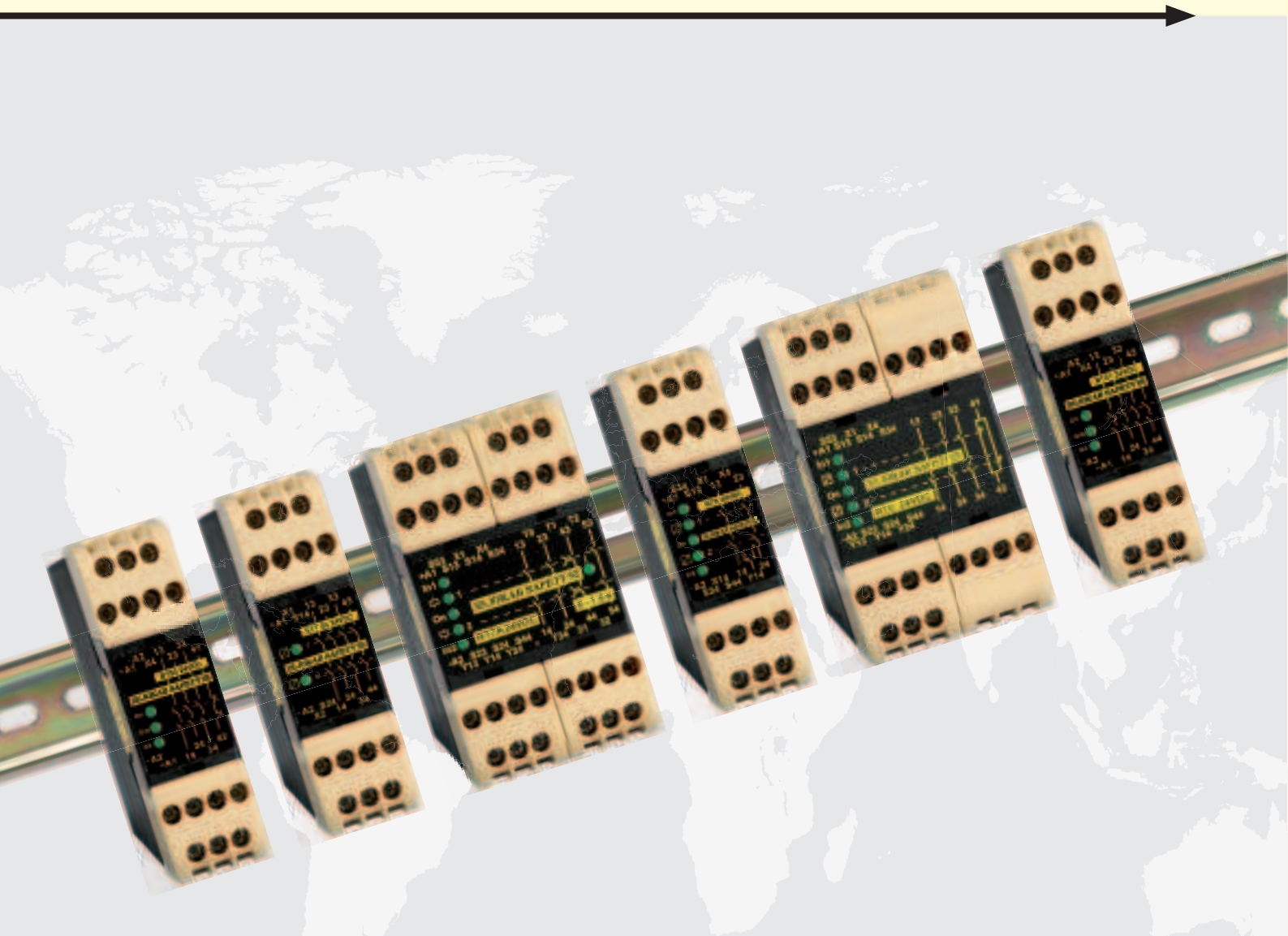


Sicherheitsrelais



Wofür brauchen Sie Sicherheitsrelais?

- um die bestehenden Sicherheitsnormen zu erfüllen!

"Ein Defekt in der Logik des Steuerkreises, eine Störung oder Beschädigung des Steuerkreises darf nicht zu gefährlichen Situationen führen." Dies ist die Forderung in der Maschinen-Richtlinie 98/37/EC der EU unter der Überschrift: 1.2.7. "Störung des Steuerkreises". Die Richtlinie schreibt vor, dass niemand einer Gefahr ausgesetzt werden darf, wenn beispielsweise ein Relais klemmt oder ein Transistor oder zwei elektrische Leiter einen Kurzschluss haben.

Ein Sicherheitsrelais erfüllt diese Anforderungen. Ein Sicherheitsrelais hat beispielsweise Eingänge, die auf Kurzschlüsse

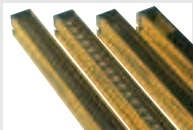
überwacht werden sowie zweifache redundante Schaltkreise, die bei jedem Schaltvorgang überprüft werden. Dies lässt sich mit den zweifachen Bremskreisen im Automobil vergleichen. Wenn einer der Kreise defekt ist, bringt der andere das Auto zum Stehen. Im Sicherheitsrelais gibt es eine zusätzliche Funktion, die den Maschinenanlauf nur dann erlaubt, wenn beide Schaltkreise in Ordnung sind.

Die Norm für sicherheitsgerichtete Teile des Steuerungssystems beschreibt verschiedene Sicherheitskategorien in Abhängigkeit von der Risikostufe und Anwendung. Ein einziges Universalrelais mit wählbarer Sicherheitskategorie löst dieses Problem.

- um Unfallschutzgeräte zu überwachen!



Licht-schranken



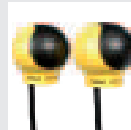
Lichtvorhänge/
Lichtgitter



Zustimmungs-schalter



Sicherheits-Verriegelungs-schalter



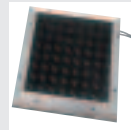
Zweihand-Steuerungen



Not-Halt-Taster



Schalt-leisten und Bumper



Schalt-matten

- für sichere Abschaltungen und zuverlässige Wiederanläufe!



Zweifache Abschalt-sig-nale, wenn das Tor geöffnet wird.

Das Eintreten oder das Eindringen einer Hand oder eines Körperglieds in einen Gefahrenbereich muss zum sicheren Stillstand aller Maschinen führen, die Personenverletzungen verursachen können. Viele ernsthafte Unfälle treten ein, wenn man glaubt, dass die Maschinen abgeschaltet wurden, sie in Wirklichkeit aber in der Programmfolge eine Pause einlegen. Das Sicherheitsrelais überwacht den Türverriegelungs-schalter und die Kabel und liefert zweifache Abschalt-sig-nale.



Überwachte Rückstel-lung, wenn sich eine Person im Gefahren-bereich aufhalten kann.

Stellen Sie sicher, dass sich beim Betätigen der Rückstell-taste niemand im Gefahrenbereich aufhält. Man muss eine überwachte Rückstell-taste drücken und loslassen, bevor eine Rückstellung erfolgen kann. Viele ernsthafte Unfälle wurden durch eine versehentliche und unüberwachte Rückstellung verursacht.



Verzögerte Rückstel-lung, wenn Sie nicht den gesamten Gefahren-bereich sehen können.

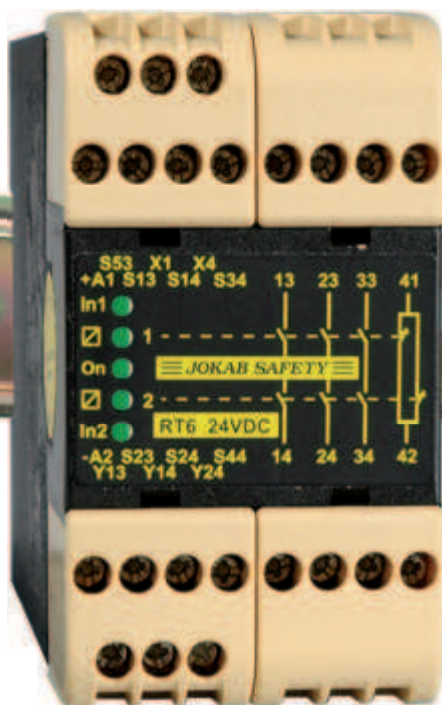
Manchmal ist eine zweifache Rückstellung nötig, um sicher-zustellen, dass niemand im Gef-ahrenbereich zurück gelassen wurde. Nach Sicherstellung, dass keine weitere Person im Gefahrenbereich ist, muss man zuerst die Vor-Rückstell-taste be-tätigen und dann innerhalb einer angemessenen Zeit, z.B. 10 Se-kunden, die Rückstell-taste außer-halb des Gefahrenbereichs. Ein Sicherheits-Zeitrelais und ein Sicherheitsrelais können diese Aufgabe erledigen.



Automatische Rückstel-lung für kleine Hauben.

Dort, wo kein Körper durch die Haube eintreten kann, darf die Sicherheitsschaltung automa-tisch rückgestellt werden. Die Sicherheitsrelais werden sofort rückgestellt, wenn die Kontak-te des Hauben-Verriegelungs-schalters geschlossen werden.

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:



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

Inputs

The RT6 can be configured to operate with any of the following input options:

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

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.

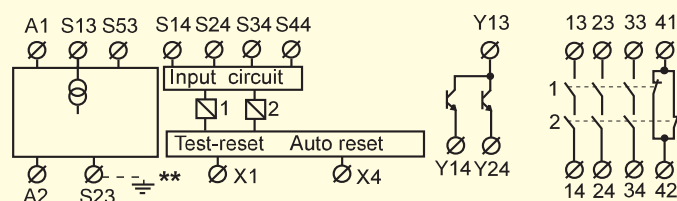
The input options 3 and 4 have the highest safety levels as all short-circuits and power failures are supervised. This in combination with internal current limitation makes the relay ideal for supervision of safety mats and contact strips.

Regulations and standards

The RT6 is designed and approved in accordance with appropriate directives and standards. Examples of such are 98/37/EC, EN ISO 12100-1/-2, EN 60204-1 and EN 954-1/EN ISO 13849-1.

Connection examples

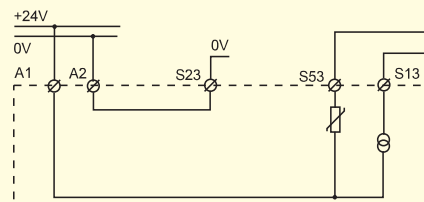
For examples of how our safety relays can solve various safety problems, see the section "Connection examples".



**Only for AC supply

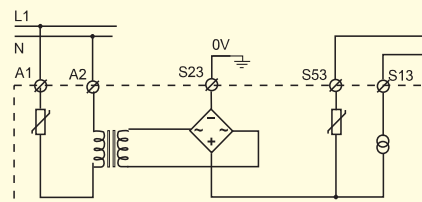
Connection of supply - RT6

DC supply



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

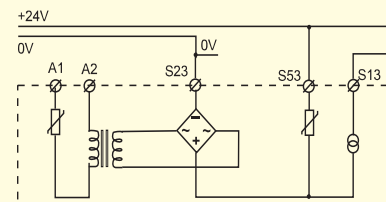
AC supply



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



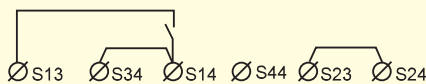
All AC-units can also be supplied by +24 VDC to S53 (0VDC to S23).

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.

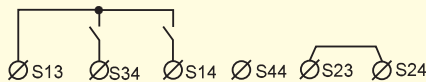
Connection of safety devices - RT6

1. SINGLE CHANNEL, 1 NO from +24V



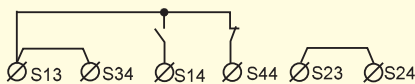
The input (contact to S14) must be closed before the outputs can be activated. When the input contact is opened the relay safety output contacts open.

2. DUAL CHANNEL, 2 NO from +24V



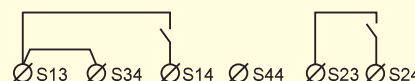
Both input contacts (S14 and S34) must be closed before the relay outputs can be activated. The safety relay contacts will open if one or both of the input contacts are opened. Both the input contacts must be opened and reclosed before the relay can be reset. A short-circuit between inputs S14 and S34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



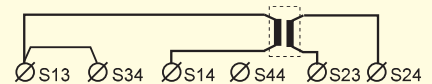
One input contact must be closed (S14) and one opened (S44) before the relay outputs can be activated. The safety relay contacts will open if one or both of the inputs change state or in case of a short-circuit between S14 and S44. Both inputs must return to their initial positions before the relay outputs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

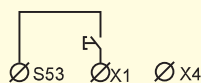
5. Safety mat/Contact strip



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.

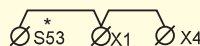
Reset connections - RT6

Manual supervised reset



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

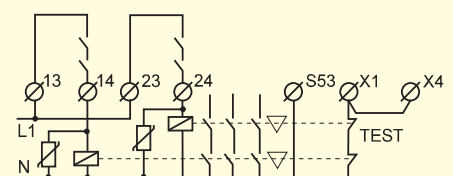
Automatic reset



*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.

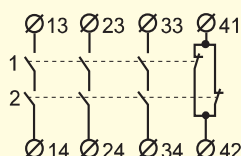
Testing external contactor status



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

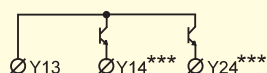


The RT6 has three (3 NO) safety outputs and 1 NC information output.

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:

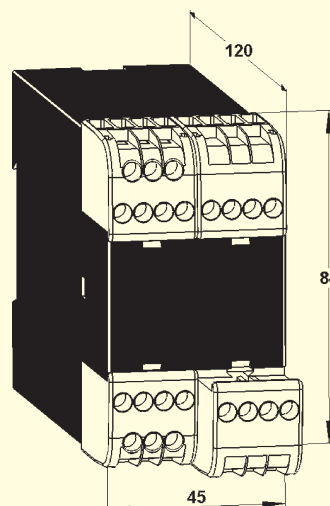
- Y14 becomes conductive when the relay input conditions are fulfilled.
- Y24 becomes conductive when both the output relays are activated.

***NOTE

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

Technical data - RT6	
Manufacturer	JOKAB SAFETY AB, Sweden
Article number/Ordering data	10-026-00 RT6 24DC 10-026-02 RT6 24AC 10-026-03 RT6 48AC 10-026-04 RT6 115AC 10-026-05 RT6 230AC
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 AC supply, nominal voltage	<2.4 W 5.3 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 S24 (0V) input S34 (+) input S44 (+) input	20 mA 20 mA 20 mA 30 mA
Reset input X1 Supply for reset input Reset current Minimum contact closure time for reset	+24 VDC 300 mA current pulse at contact closure, then 30 mA 100 ms
Maximum external connection cable resistance at nominal voltage for S14, S24, S34 S44, X1	300 Ohm 150 Ohm
Response time At Power on DC/AC When activating (input-output) When deactivating (input-output) At Power Loss	<90ms/<220ms <20 ms <20 ms <150 ms
Relay outputs NO NC Maximum switching capacity res. load AC Maximum switching capacity res. load DC Maximum switching capacity res. load Minimum load Contact material Mechanical life	3 1 6A/250 VAC/1500 VA 6A/24 VDC/150 W 12A distributed on all contacts 10mA/10 V (if load on contact has not exceeded 100 mA) Ag+Au flash >10 ⁷ operations

Transistor outputs External supply to Y13 Y14 Y24 Maximum load of Y14, Y24 Maximum voltage drop at maximum load	Short-circuit proof +5 to +30 VDC Indicates that the input conditions have been fulfilled Indicates that the output relays are activated 15 mA /output 2.4 V
LED indication On ● In1 ● In2 ● ☐ ● 1 ☐ ● 2	Supply voltage OK, the LED is on Flashing light in case of under-voltage or overload Indicates that the input conditions are fulfilled. Indicates that the output relays are activated.
Mounting Rail Operating temperature range	35 mm DIN rail -10° C to + 55° C
Connection block (detachable) Maximum screw torque Maximum connection area Solid conductors Conductor with socket contact Air and creep distance	1 Nm 1x4mm ² /2x1.5mm ² /12AWG 1x2.5mm ² /2x1mm ² 4kV/2 IEC 60664-1
Protection class Enclosure Connection block	IP 40 IEC 60529 IP 20 IEC 60529



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