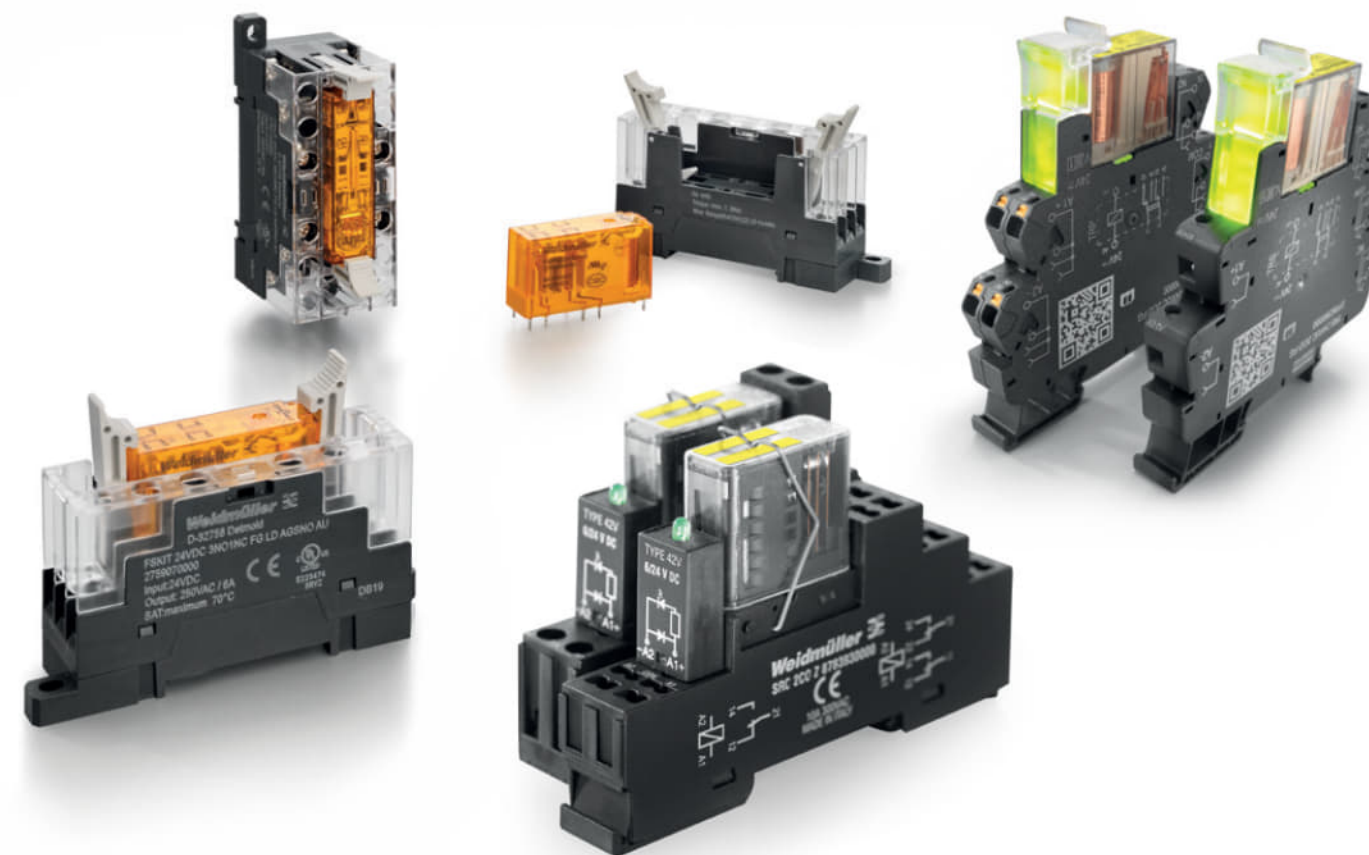


## Relay with forcibly guided contacts

Relay modules for reliable feedback of the switching status

Relay modules with positively-driven contacts are used in safety-related applications to provide reliable feedback on the switching state of the operating contact to the control system. They enable safe diagnosis via a positively-driven NC contact and ensure reliable exchange of signals between two systems with feedback function. In elementary relays with positively-driven NO and NC contacts, the contacts are mechanically connected to each other. This means that NO and NC contacts can never be closed at the same time, so that a diagnostic coverage of 99 % is achieved.





## Forced guided contacts explained in detail

### The difference to relays with conventional contacts

Relay modules with forcibly guided contacts use elementary relays according to IEC 61810-1 with a contact set according to IEC 61810-3. From the outside, they can hardly be differentiated from relays with conventional contacts, if at all.

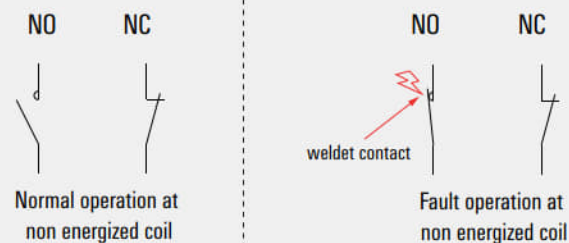
Due to their design, an opening failure of forcibly guided contacts can be reliably detected. Relays with such contacts have the following additional characteristics compared to relays with conventional contacts:

- Forcibly guided NC and NO contacts are designed in such a way that they cannot be closed at the same time
- If a contact of a forcibly guided contact set is welded, the antivalent contacts cannot close and the contact opening must be  $> 0.5 \text{ mm}$
- The contacts are located in contact chambers and are thus specially protected against other contacts and against the coil

Due to these normative requirements, the design and manufacturing effort for relays with positively driven contacts is much higher.

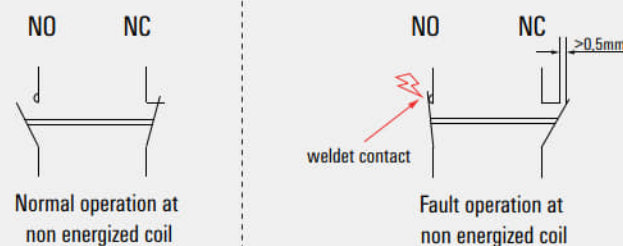
The normally open contact (NO) is welded in this example. With standard relays, a normally closed contact (NC) can also be closed in case of the de-energized state. In this way, the NC and NO contacts can be closed at the same time and an opening failure cannot be reliably detected.

conventional relay



The normally open contact (NO) is welded in this example. In this case, relays with forcibly guided contacts cannot have a normally closed contact (NC) which is closed in the de-energized state. In this way, the NC and NO contacts cannot be closed at the same time and an opening failure can be reliably detected. It is mechanically ensured that the NC contact remains open with a minimum contact gap of  $0.5 \text{ mm}$  even in the de-energized state.

relay with forcibly guided contacts



In addition, the standard distinguishes between two types of positive guidance, type A and type B:

#### Type A

With type A relays, **all** contacts are mechanically positively driven with each other.

In an example of a six-pole relay with four NO contacts and two NC contacts, the four NO contacts are forcibly guided with both NC contacts. In this example, if one of the NO contacts welds, both NC contacts may no longer close if the relay is de-energized.

**Type A relays with forcibly guided contacts can be found in our SAFESERIES Contact Extension.Extension.**

#### Type B

In a type B relay, **not all** contacts of a contact set are positively driven with each other.

In an example of a six-pole relay with four NO contacts and two NC contacts, the four NO contacts are forcibly guided with just one of the NC contacts. In this example, if one of the NO contacts welds, the non-force-guided NC contact can still close if the relay is de-energized. The other forcibly guided NC contact may not close. The status of the other NO contacts is undetermined. The non-force-guided NC contact can close because it is not forcibly guided to the other contacts in the relay. The contacts which are not forcibly guided must be specified in the data sheet.

Positively driven relays with changeover contacts (CO) are assigned to type B by the standard, only one NC or NO contact may be used per changeover contact. The reason for this is that the phenomenon of contact spring breakage cannot be excluded, so that in the event of a spring breakage of a changeover contact set, the NO and NC contacts of this contact set can be short-circuited.

**Type B relays with forcibly guided contacts can be found in our TERMSERIES FG and RIDERSERIES FG.**

# TERMSERIES FG

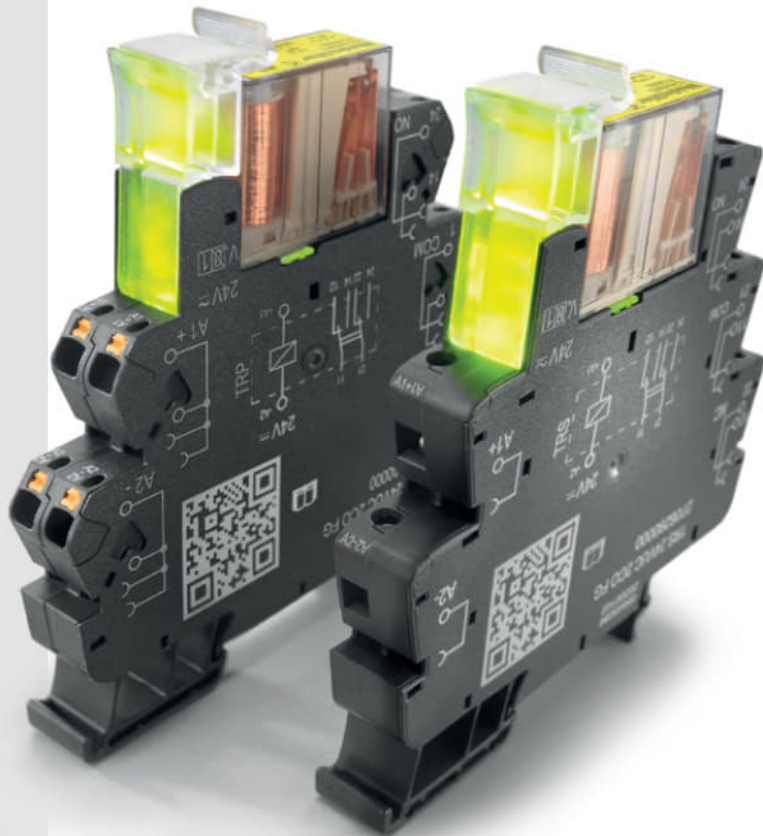
## Reliable switching status monitoring in our all-rounder

In safety-related applications, relays with positively-driven contacts have proven themselves many times over. Our TERMSERIES relay modules with positively driven contacts are predestined for safe signal monitoring in a wide variety of applications.

Their switching function is clearly indicated by an illuminated ejector lever, which also has an integrated marker holder. Compatibility with all TERMSERIES accessories allows high flexibility and easy integration into existing systems. TERMSERIES relay modules have cULus certification which is required for use in the North American market.

### Your special advantages

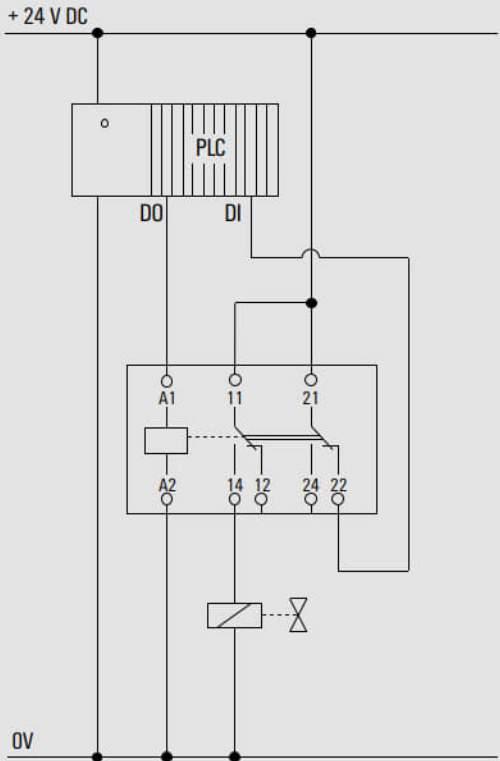
- Modular interface relay in 12.8 mm width
- 2 CO contacts with 6 A, forcibily guided according to EN 61810-3 type B
- cULus listed" for high acceptance in the on the North American market
- Positive guidance ensures a synchronous switching status at both contacts and achieves a diagnostic coverage of 99 %
- Compatibility with all accessories of the TERMSERIES
- Variants with screw and PUSH IN connection technology
- Assembled and 100 % functionally tested KIT, consisting of relay and socket



You will find more information in our online catalogue

### Application example

Control of a solenoid valve with feedback to the control system



SIL

With the forcibly guided contacts, we address the segments machinery, signalling for railway, wind power and elevator / escaator.

### TERMSERIES FG

Type	Version	Contact	Continuous current	Rated control voltage	Connection	Qts	Order No.
TRP 24VUC 2CO FG	Complete module	2 CO contacts forcibly guided (EN 61810-3 type B) AgNi	6 A	24 V UC	PUSH IN	5	2706430000
TRS 24VUC 2CO FG	Complete module	2 CO contacts forcibly guided (EN 61810-3 type B) AgNi	6 A	24 V UC	Screw	5	2706290000
RCH424024FG	Individual relay	2 CO contacts forcibly guided (EN 61810-3 type B) AgNi	6 A	24 V DC	-	20	2723360000



# RIDERSERIES FG

## Industrial relay modules with forcibly guided contacts

Relays with forcibly guided contacts have a 99 % diagnostics coverage and an excellent reputation for use in safety systems. The contacts interlock mechanically with each other in order to ensure a synchronous switching status of both contacts. This guarantees that the alert contact will maintain the same switching status in the event of an error.

### Your special advantages

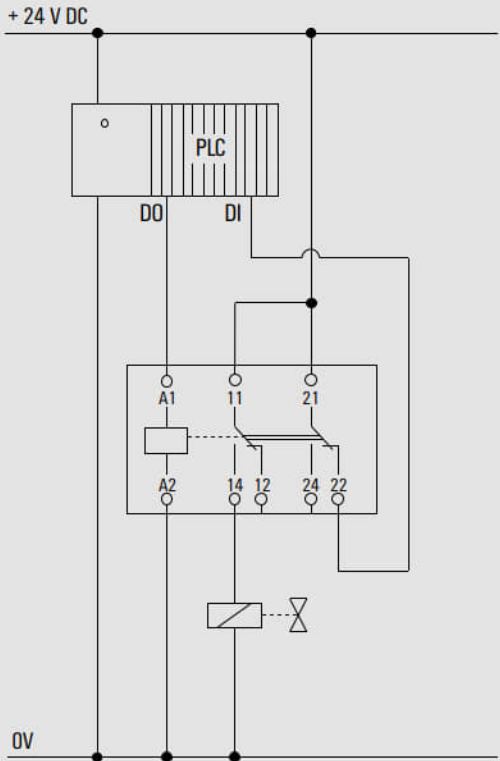
- Compact design in industrial standard design from 15.6 mm overall width
- 2 CO contacts with 6 A, positively driven according to EN 61810-3 type B
- Status LED: green and free-wheeling diode on the control side
- Variants with screw and tension connection technology
- Assembled and 100 % functionally tested KIT, consisting of relay, socket, retaining clip and LED modules



You will find more information in our online catalogue

### Application example

Control of a solenoid valve with feedback to the control system



### RIDERSERIES FG

Type	Version	Contact	Continuous current	Rated control voltage	Connection	Qts	Order No.
RCIKIT 24VDC 2CO LD/FG	Complete module	2 CO contacts forcibly guided (EN 61810-3 type B) AgCuNi	6A	24 V DC	Screw	10	1218410000
RCIKITZ 24VDC 2CO LD/FG	Complete module	2 CO contacts forcibly guided (EN 61810-3 type B) AgCuNi	6A	24 V DC	Tension	10	1218390000
RCI42424FG	Individual relay	2 CO contacts forcibly guided (EN 61810-3 type B) AgCuNi	6A	24 V DC	-	12	1218380000

# SAFESERIES Contact Extension

## Reliably monitor switching states of multi-channel signals

The SAFESERIES Contact Extension uses relays with forcibly giuded contacts in accordance with EN 61810-3 Type A. This makes it predestined for signal monitoring in applications for the protection of people and machinery.

It ensures safe feedback to the control level. It consists of 4 different pluggable relays with matching screw sockets. When the application is designed according to EN/ISO 13849-1, a performance level of PL "e" can be achieved. The basic component is also suitable for safety applications according to IEC/EN 62061 in order to achieve a safety integrity level of SIL3.

### Your special advantages

- Industrial relay modules from 22.4 mm width in the contact versions 2 NO + 2 NC, 3 NO + 1 NC, 4 NO + 2 NC and 3 NO + 3 NC
- Relays with forcibly guided contacts according to EN 61810-3 type A
- Status LED: green and free-wheeling diode in the socket on the control side
- "cULus listed" for high acceptance on the North American market
- CQC approval for conformity with the Chinese quality standards
- Assembled and 100 % functionally tested KIT, consisting of relay and socket

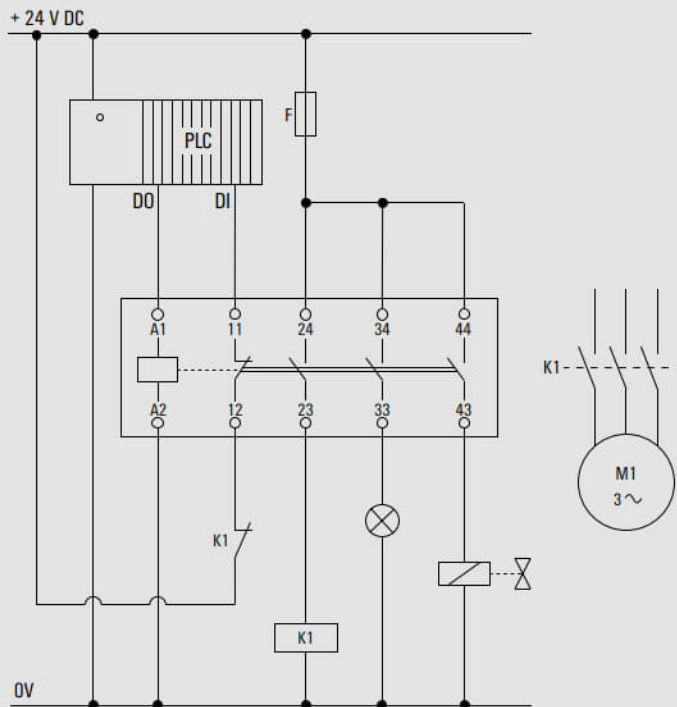


You will find more information in our online catalogue



### Application example

Control of multiple loads with feedback to the controller



### KITs - Socket inclusive relay

Type	Contact	Continuous current	Rated control voltage	Version	Connection	Qts	Order No.
FSKIT 24VDC 3NO1NC FG LD AGSNO AU	3NO1NC, forcibly guided (EN 61810-3 Typ A)	6 A	24 V DC	Status LED, Verpolungsschutz	Screw	1	2759070000
FSKIT 24VDC 2NO2NC FG LD AGSNO AU	2NO2NC, forcibly guided (EN 61810-3 Typ A)	6 A	24 V DC	Status LED, Verpolungsschutz	Screw	1	2759080000
FSKIT 24VDC 4NO2NC FG LD AGSNO AU	4NO2NC, forcibly guided (EN 61810-3 Typ A)	6 A	24 V DC	Status LED, Verpolungsschutz	Screw	1	2759090000
FSKIT 24VDC 3NO3NC FG LD AGSNO AU	3NO3NC, forcibly guided (EN 61810-3 Typ A)	6 A	24 V DC	Status LED, Verpolungsschutz	Screw	1	2759100000

### Individual relays

Type	Contact	Continuous current	Rated control voltage	Contact material	Qts	Order No.
FSR0315024 FG	3NO1NC, forcibly guided (EN 61810-3 Typ A)	6 A	24 V DC	AgSnO gold plated	1	2759030000
FSR0225024 FG	2NO2NC, forcibly guided (EN 61810-3 Typ A)	6 A	24 V DC	AgSnO gold plated	1	2759040000
FSR0425024 FG	4NO2NC, forcibly guided (EN 61810-3 Typ A)	6 A	24 V DC	AgSnO gold plated	1	2759050000
FSR0335024 FG	3NO3NC, forcibly guided (EN 61810-3 Typ A)	6 A	24 V DC	AgSnO gold plated	1	2759060000

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