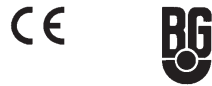


## Safety relay

### SCR

Control category 3 and 4  
according to EN 954-1  
With extended output functions  
and up to 4 safety outputs



The SCR safety relay is another new member of the Safelock *Family*, designed to monitor, for example, safety position switches and emergency-stop buttons. It thereby makes it possible to build safety systems up to control category 4 with Bernstein safety switches. Bernstein now offers all necessary safety components for monitoring safety doors or guards outside of the power stage.

The SCR module monitors the position and function of the safety sensing equipment including the safety contacts of the position switches. Control system devices such as frequency converters or power contactors are driven according to the safety evaluation. Additionally, the actual status of the power contactors are verified and compared to the input position in order to monitor their correct function. To meet the requirements of safety category 4, each fault has to be recognised immediately or at the next machine start. For this reason, it is necessary to perform a start-up test.

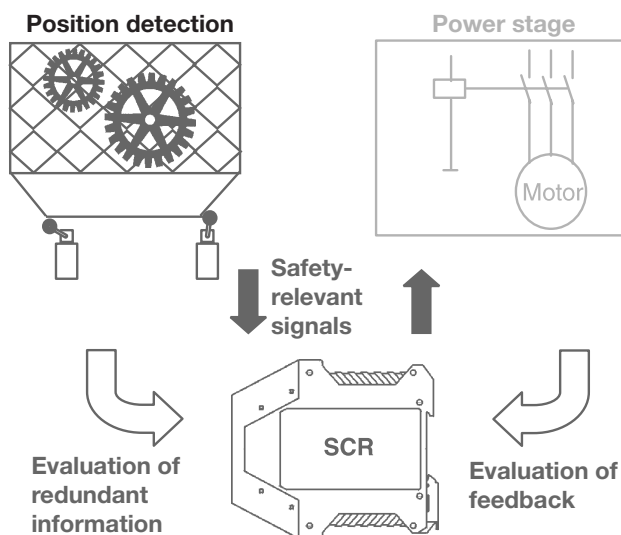
#### Operating method

The SCR continuously analyses two galvanically-isolated, normally-closed contacts that are operated in a synchronised manner within the system (i.e. the normally-closed contacts belonging to two position switches on the same door). The power device can only be operated when both normally-closed contacts are actually closed. As soon as one of the two input circuits is interrupted, by the opening of a safety contact or a fault occurs, the safety outputs open and the machine is turned off.

Should the switch-off be due to a fault in one of the input circuits or in the output device in the control system, then the SCR prevents a renewed start-up, until the fault has been repaired.

The SCR 4 modules also have a status indicator for both channels to simplify the task of maintenance personnel in identifying the fault.

All SCR modules are optionally suitable for automatic or manual starts. The SCR 4 modules also allow the start button to be monitored.





### System advantages

- Monitoring of two independent, galvanically-isolated safety circuits.
- Cross-connection safety, i.e. possible cross-connections between the cables to the safety position switches will be recognised and the green LED "Power" extinguishes. This is made possible because both input circuits work on different operating voltages. A faulty cross-connection leads to a short-circuit and the triggering of the internal fuse.
- Start-up testing, i.e. before the machine can be restarted by means of a start button, a start-up test ascertains that no fault exists in the control system.
- Safety outputs, i.e. at least 2 safety outputs made up of normally-open contacts are available to redundantly drive two power contactors.
- Feedback circuit or external device monitoring (EDM), i.e. correct operation of the power contactors is monitored by wiring the "EDM loop" through the auxiliary NC contacts. This means: should a power contactor fail to release, the normally-closed contacts, connected in series to the start button, prevent a renewed machine start.
- As well as the two standard LEDs for indicating the voltage supply (Pow) and output status (out), the SCR 4 has two additional yellow LEDs (Ch1 and Ch2). These are lit when a fault occurs, and indicate which channel is faulty.
- The SCR safety relays have the following approvals UL, CSA and BG.
- Standardised enclosure widths 22.5 and 52.5 mm.
- Mounting on TS35 mounting rails.

### The SCR family

**SCR 3-W22-3.6-D:**  
The SCR 3 has been designed for category 3 control systems according to EN 954-1. The control module guarantees one-fault safety for the entire system, i.e. the occurrence of a single fault does not place the entire system into a dangerous state.

**SCR 4-W22-2.6-SD:**  
In addition to the safety function of SCR 3, the SCR 4 recognises each fault either immediately or on the next attempt to re-start the machine. This characteristic corresponds to control systems for category 4 according to EN 954-1. An additional programmable option allows for the start button to be monitored.

**SCR 4-W52-4.10-SD:**  
Incorporating all of the features of SCR 4-W22, the SCR 4-W52 has additional safety outputs.

## Possible SCR connections

### Two-channel circuit with monitored start

- Connect a safety switch to each of the terminals S11/S12 and S21/S22
- Connect the start button and the feedback contacts from an external contactor to terminals X1/X2

The green LED "POWER" is lit when voltage is applied. When the start button is pushed, the green LED "Output" lights and the safety outputs are closed.

The machine must be restarted following each opening and closing of the safety door.

For emergency-stop applications, both safety-switches are replaced by an emergency-stop button or a rope-pull safety switch with two positive break contacts.

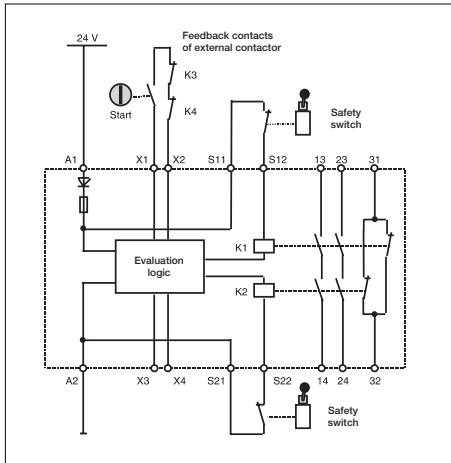
### Two-channel circuit with automatic start

- Connect a safety switch to each of the terminals S11/S12 and S21/S22
- Connect the feedback contacts to terminals X1/X2
- Bridge the terminals X1/X2 and X3/X4

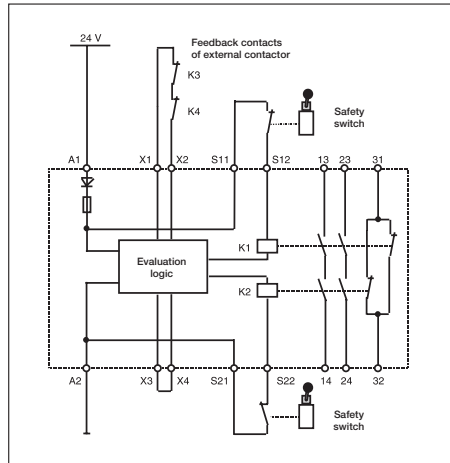
The green LED "POWER" lights up when voltage is supplied. The safety outputs close immediately and the green LED "Output" lights up.

The machine starts up immediately following each opening and closing of the protective door.

Two-channel circuit with monitored start



Two-channel circuit with automatic start



Designation

**Part number**

Control category

Enabling path

**Function**

Analysable contact-pair

Start function

automatic

manual

manual (start button monitored)

Data outputs (normally-closed contact)

**Voltage supply**

Operating voltage

Max. power consumption

**Outputs**, user categories

Switching voltage max.

Switching current max.

Power rating max.

LED: Operating voltage (green)

Switching output (green)

Error diagnosis (2 x yellow)

Switching cycles, mechanical

**Ambient conditions**

Temperature range min./max.

Protection class (according to DIN 40050)

for terminal range

Enclosure material

Mounting possibilities

Connection type: terminal block/cable (braided)

Weight

Dimensions (W x H x D) max.

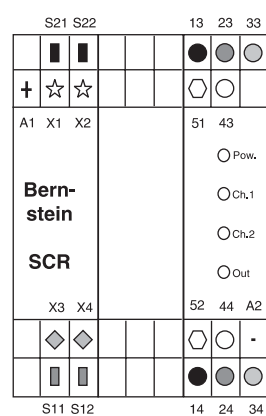
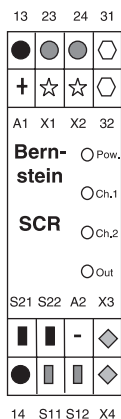
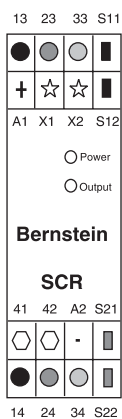
Approvals

Delivery: ex-stock/built to order

- Safety output 1
- Safety output 2
- Safety output 3
- Safety output 4
- Data output (normally-closed contact)
- + - Voltage supply 24 V AC/DC
- Connection for safety contact 1
- Connection for safety contact 2
- ☆ Connection for feedback (EDM) and start button
- ◇ Program input: Change from monitored start to automatic start achieved by bridging the terminals



SCR 3-W22-3.6-D 607.5111.003	SCR 4-W22-2.6-SD 607.5111.001	SCR 4-W52-4.10-SD 607.5141.002
3	4	4
3	2	4
2 Ö	2 Ö	2 Ö
•	•	•
•	•	•
-	•	•
1	1	1
24 V AC/DC	24 V AC/DC	24 V AC/DC
60 mA	60 mA	150 mA
AC 15 250 V/6 A DC 13 24 V/6 A	AC 15 250 V/6 A DC 13 24 V/6 A	AC 15 250 V/5 A DC 13 24 V/2 A
250 V	250 V	250 V
6 A	6 A	10 A
1500 VA	1500 VA	2500 VA
150 W	150 W	240 W
•	•	•
•	•	•
-	•	•
10 x 10 <sup>6</sup>	10 x 10 <sup>6</sup>	30 x 10 <sup>6</sup>
0-70 °C	0-70 °C	0-55 °C
+ 32 °F/+ 158 °F	+ 32 °F/+ 158 °F	+ 32 °F/+ 131 °F
IP 40	IP 40	IP 40
IP 20	IP 20	IP 20
PA 6.6	PA 6.6	PA 6.6
TS 35	TS 35	TS 35
2.5 mm	2.5 mm	2.5 mm
0,2 kg	0,2 kg	0,4 kg
22.5 x 99 x 114.5	22.5 x 99 x 114.5	52.5 x 99 x 114.5
BG	BG	BG
•/-	•/-	•/-



# Safety Control Relay

## SCR

Control categories 2 up to 4 (EN 954-1)

### SCR 4-W70-3.8-DT

Safety relay with integrated, reliable timer

### SCR 4-W22-2.4-S

Safety relay in compact design

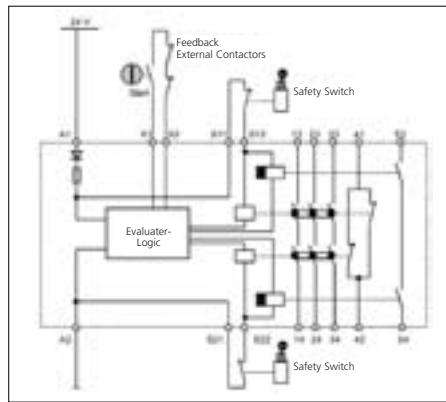
### SCR 2-W22-3.5-D

Low-cost safety relay up to SK2

#### SCR 4-W70-3.8-DT features

Control category according to regulations:  
– EN 954 Category 4

- Monitoring of "safety" guard and EMERGENCY STOP devices
- Monitoring of two redundant "safety" input signals
- Monitoring of short-circuiting in the "safety" input circuits
- Safe start up via monitored start button
- 3 enabling paths and 1 data output
- Monitoring of the power contactors via feedback circuit
- 1 enabling path with 10 s time delay, control category according to EN 954 Category 3

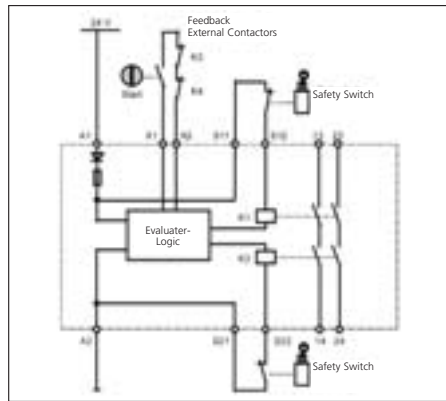


Circuitry: SCR 4-W70-3.8 DT

#### SCR 4-W22-2.4-S features

Control category according to regulations:  
– EN 954 Category 4

- Monitoring of safety guard and EMERGENCY STOP devices
- Monitoring of two redundant "safety" input signals
- Monitoring of short-circuiting in the "safety" input circuits
- Safe start up via monitored start button
- 2 enabling paths
- Monitoring of the power contactors via feedback circuit

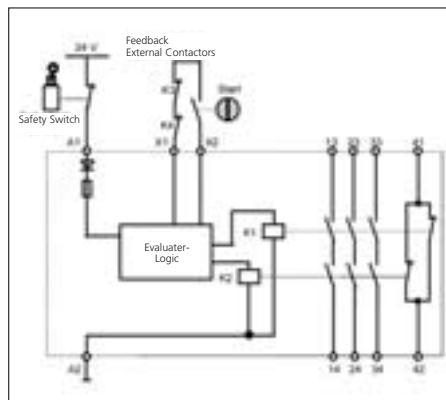


Circuitry: SCR 4-W22-2.4-S

#### SCR 2-W22-3.5-D features

Control category according to regulations:  
– EN 954 Category 2

- Monitoring of safety guard and EMERGENCY STOP devices
- Testing of safety control at every machine start
- One-channel "safety" input signal
- Automatic or manual machine starts possible
- 3 enabling paths
- Monitoring of the power contactors via feedback circuit



Circuitry: SCR 2-W22-3.5 D

Designation

**Part number**

Control category

Enabling path (not delayed/delayed)

**Function**

Contacts to be monitored

Start function

automatic

manual

manual (start-button monitored)

Data outputs (normally-closed contact)

**Electrical ratings**

Operating voltage

Max. power consumption

**Outputs, ratings**

Switching voltage

max.

Switching current

max.

Power rating

max.

LED: Operating voltage (green)

Switching output (green)

Function indication (green)

Mechanical life, switching cycles

**Ambient conditions**

Temperature range

min./max.

Protection class (acc. to IEC 529)

housing

terminals

Housing material

Installation

Connection type: terminal block (cable/stranded wire)

Weight

Dimensions (W x H x D)

max.

Approvals

Delivery: ex-stock/built to order

- Enabling path 1: (13/14)
- Enabling path 2: (23/24)
- Enabling path 3: (33/34)
- Enabling path 4: (53/54) delayed
- ◻ Data output (normally-closed contact)
- + - Supply voltage 24 V AC/DC
- Connection for safety contact 1
- Connection for safety contact 2
- ☆ Connection for feedback and start button



SCR 4-W70-3.8-DT 607.5151.006	SCR 4-W22-2.4-S 607.5111.005	SCR 2-W22-3.5 D 607.5111.007
4/3	4	2
3/1 with 10 s	2/-	3/-
2 Ö	2 Ö	1 Ö
-	-	•
-	-	•
•	•	-
1	-	1
24 V AC/DC 180 mA	24 V AC/DC 60 mA	24 V AC/DC 60 mA
AC 15 230 V/5 A      DC 13 24V/2 A	AC 15 230 V/4 A      DC 13 24 V/4 A	AC 15 230 V/5 A      DC 13 24 V/4 A
250 V                  24 V	250 V                  24 V	250 V                  24 V
8 A                    8 A	4 A                    4 A	5 A                    5 A
2000 VA              200 W	1500 VA              150 W	1500 VA              150 W
•	•	•
-	•	-
• (2 x 2)	-	• (2)
30 x 10 <sup>6</sup>	10 x 10 <sup>6</sup>	10 x 10 <sup>6</sup>
0-55 °C	0-70 °C	0-70 °C
+32 °F/+131 °F	+32 °F/+158 °F	+32 °F/158 °F
IP 40	IP 40	IP 40
IP 20	IP 20	IP 20
PA 6.6	PC	PC
TS 35	TS 35	TS 35
2.5 mm <sup>2</sup>	2 x 2.5 mm <sup>2</sup>	2 x 2.5 mm <sup>2</sup>
0.5 kg	0.2 kg	0.2 kg
70 x 99 x 114.5	22.5 x 82 x 98.8	22.5 x 82 x 118
BG	BG	BG
•/-	•/-	•/-

