

MAIN CATALOG

# Safety Products

## ABB Jokab Safety



# Safety relay

## Sentry

The Sentry safety relays are powerful and easy to use safety relays, suitable for all common types of safety applications.

The Sentry series contains basic models for simple applications and easy output expansion, as well as highly flexible models with extremely accurate timer functions.

Sentry safety relays are used in both simple and more advanced safety solutions when safety devices need to be monitored according to the requirements of functional safety standards.



Continuous operation

### LEDs and display

LEDs in 3 colours allow for more status messages and simplify troubleshooting. Models with display offer preset configurations and extensive fault information.

### Advanced timer functions

Timer functions with an accuracy of  $\pm 1\%$  minimize unnecessary downtime.

### Multi-reset

The multi-reset function enables reset of up to 10 Sentry safety relays using just one reset button.



Optimized logistics

### Universal models

A single safety relay for all common safety applications reduces stock and saves warehouse space.

### Multi-voltage

Multi-voltage models offer more flexibility and less stock.

### Compact size

All models are only 22.5 mm wide, even models with 2 NO + 2 NO outputs.



Easy to install

### Detachable terminal blocks

Detachable terminal blocks speed up connection and replacement.

### Switch for reset selection

Manual or automatic reset easily selectable by switch.

### Powerful outputs

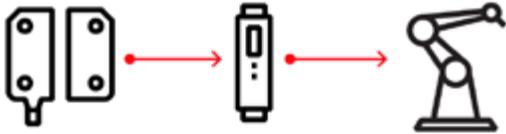
Powerful outputs allow to drive larger contactors and simplify installation by saving the use of an intermediary contactor.

## Applications

### Sentry

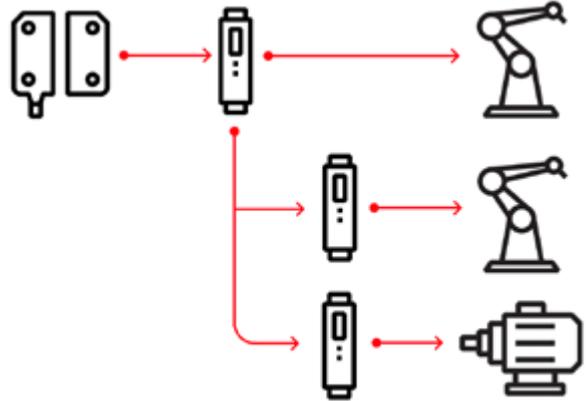
#### Monitoring of safety devices

Sentry safety relays make it easy to reach the required level of safety when monitoring safety devices like emergency stop buttons, door switches, light guards, etc.



#### Expansion of safety outputs

Sentry expansion modules are used to increase the number of safety outputs of a safety control module in order to control more machinery.



## Features

### Sentry

#### Timer functions with an accuracy of $\pm 1\%$

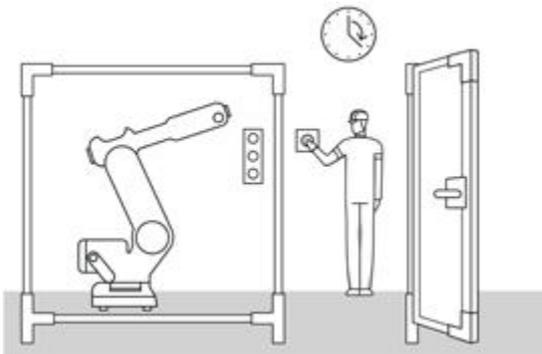
Several timer functions are available: On/Off-delay, time bypass and time reset.

On/Off-delay are used to postpone the activation/deactivation of the safety outputs with a preset time delay. This is used in e.g. Category 1 stops.

Time bypass activates the safety outputs for a maximum predefined time when the safety inputs are closed. Inching is an example of application.

Time reset activates the safety outputs for a maximum predefined time when the safety inputs are opened. Pre-reset is an example of application.

An accuracy of  $\pm 1\%$  allows a very precise time to be set in order to increase safety and minimize unnecessary downtime.



#### Multi-reset

The multi-reset function enables reset of up to 10 Sentry safety relays using just one reset light-button. This simplifies connection, minimizes cabling and unnecessary downtime. The multi-reset function is available for all +24 VDC Sentry models offering manual reset.

#### Light-button function

The light-button function is used for the multi-reset function, but can also be used for a standard reset button. The function of the LED in the light-button is the following:

- on** - at least one input is not accepted
- flashing** - all inputs are accepted, reset possible
- off** - all inputs accepted, reset performed, outputs active

Note: if an input is accepted it means that the door is closed, the light curtain is not interrupted, etc.



#### Configurable models with display

The models with display are configurable and the user can choose between preset configurations and a custom configuration that can be protected by password.

#### Faster troubleshooting with display

The display minimizes troubleshooting by giving extensive information about internal faults, I/O faults, system faults, function faults and a log of the last 10 errors.



#### Switch for selection of the reset function

All models can be used in automatic reset and some models allow to choose manual reset, either by switch or by configuration, which simplifies connection. In order to prevent mistakes, it is not possible to change reset function during operation by just flipping the switch.



#### Powerful outputs

The outputs have a switching capacity of up to 6A DC-13. This allows Sentry to drive larger contactors and saves the use of an intermediary contactor.

#### Delayed outputs

Some Sentry models have delayed outputs in order to e.g. give a machine time to apply breaking force before power is disconnected.

For models with 2 NO + 2 NO outputs, it is only the second pair of NO outputs that is delayed.

For models with 3 NO + 1 NC, all outputs are delayed.

#### Single function or universal models

Sentry **SSR** models are single function safety relays designed for a specific application such as 1 and 2 channel devices, OSSD devices or two-hand devices.

Sentry **USR** models are universal safety relays. They are capable of handling most types of applications and safety devices, i.e. 1 and 2 channel devices, OSSD-devices, two-hand devices and contact mats/bumpers/edges. This means that only one type of relay is necessary as a spare, which reduces stock and saves warehouse space.

## Ordering information

### Sentry



2TLC172049V0201

BSR10



2TLC172064V0201

SSR32



2TLC172079V0201

USR10



2TLC000019F0201

S30A



2TLC000020F0201

S30B

### Ordering details

Expansion	Safety devices	Test/Reset	Safety relay outputs	Timer function	Feature	Power supply	Type	Order code
Expansion of safety controller outputs	1 channel 2 channels with equivalent contacts 2 channels with antivalent contacts OSSD outputs / PNP outputs Contact mats, bumpers and safety edges <sup>c)</sup> Two-hand devices Manual reset (all models have auto reset) Start/Test 3 NO + 1 NC 4 NO 2 NO + 2 delayed/delayable NO 4 NO + 1 NC Off-delay 0.5 s Off-delay 1.5 s Advanced timer functions 0 - 999 s <sup>d)</sup> Configurable with display					85-265 VAC / 120-375 VDC +24 VDC		
a)	• b)	•	•			•	BSR10	2TLA010040R0000
a)	• b)	•	•			•	BSR11	2TLA010040R0200
a)				•		•	BSR23 <sup>e)</sup>	2TLA010041R0600
•	• • •	•	•			•	SSR10	2TLA010050R0000
•	•	•	•			•	SSR10M	2TLA010050R0100
		•	•			•	SSR20	2TLA010051R0000
		•	•			•	SSR20M	2TLA010051R0100
	• • •	•		•	•	•	SSR32	2TLA010052R0400
	• • •	•		•	•	•	SSR42	2TLA010053R0400
•	• • •		•		• • • •	•	TSR10	2TLA010060R0000
•	• • •		•		• •	•	TSR20	2TLA010061R0000
•	•		•		• •	•	TSR20M	2TLA010061R0100
	• • • • • •	•	•		• • • •	•	USR10	2TLA010070R0000
	• • • • • •	•	•		• • • •	•	USR22	2TLA010070R0400

a) These models can also be used for expansion of Pluto safe transistor outputs (-24 VDC)

b) No monitoring of two-channel fault, i.e. max Category 3 without fault exclusion.

c) The safety relay detects a short-circuit, not a change in resistance.

d) Off-delay, On-delay, Time bypass or Time reset.

e) BSR23 must be monitored by another device in order to reach higher than Category 1/PL c according to EN ISO 13849-1, for example a safety relay, a safety PLC or an Orion light guard (EDM function).

### Accessories

Description	Type	Order code
Terminal block for Sentry safety relays. One piece.	S30A	2TLA010099R0000
Coding kit for terminal blocks. One kit for one Sentry relay.	S30B	2TLA010099R0100

## Technical data

### Sentry

#### Technical data

##### Approvals



##### Conformity

CE

2006/42/EC - Machinery

2014/30/EU - EMC

2011/65/EU - RoHS

EN ISO 12100:2010, EN ISO 13849-1:2015, EN 62061:2005+A2:2015, EN 60204-1:2006+A1:2009, EN 60664-1:2007, EN 61000-6-2:2005, EN 61000-6-4:2007, EN 61508:2010

##### Functional safety data

BSR10

BSR11, BSR23

SSR10, SSR10M, SSR20,  
SSR20M, TSR10, TSR20,  
TSR20M, USR10

SSR32, SSR42, USR22

##### EN/IEC 61508:2010

SIL3,  
PFH<sub>D</sub> = 3.0 x 10<sup>-9</sup>

SIL3,  
PFH<sub>D</sub> = 4.1 x 10<sup>-9</sup>

SIL3,  
PFH<sub>D</sub> = 4.9 x 10<sup>-9</sup>

SIL3,  
PFH<sub>D</sub> = 9.3 x 10<sup>-9</sup>

##### EN/IEC 62061:2005+A1:2013

SILCL3,  
PFH<sub>D</sub> = 3.1 x 10<sup>-9</sup>

SILCL3,  
PFH<sub>D</sub> = 4.1 x 10<sup>-9</sup>

SILCL3,  
PFH<sub>D</sub> = 4.9 x 10<sup>-9</sup>

SILCL3,  
PFH<sub>D</sub> = 3.9 x 10<sup>-9</sup>

##### EN ISO 13849-1:2008

PL e, Cat. 4,  
PFH<sub>D</sub> = 3.1 x 10<sup>-9</sup>

PL e, Cat. 4,  
PFH<sub>D</sub> = 4.1 x 10<sup>-9</sup>

PL e, Cat. 4,  
PFH<sub>D</sub> = 4.9 x 10<sup>-9</sup>

PL e, Cat. 4,  
PFH<sub>D</sub> = 3.9 x 10<sup>-9</sup>

Note! The relays must be cycled at least once a year.

##### Electrical data

##### Operating voltage

+24 VDC (19.2-27.6 VDC) PELV / SELV

Mains models: 85-265 VAC (50 / 60 Hz) or 120-375 VDC

##### Response time at deactivation

20 ms

##### Maximum switching capacity

DC13, DC1

Up to 6 A (except relays with 2 NO + 2 NO outputs that switch 3 A)

AC15, AC1

Up to 5 A (except relays with 2 NO + 2 NO outputs that switch 3 A)

##### Mechanical data

##### Operating temperature

BSR10, BSR11, BSR23

-10 °C to 55 °C

SSR10M, SSR20M, TSR20M

-20 °C to 55 °C

SSR10, SSR20, SSR32, SSR42, TSR10, TSR20, USR10, USR22

-20 °C to 65 °C

##### Humidity range

25% ... 90%

##### Protection class

IP20 (enclosure/electrical cabinet must have at least an IP54)

##### Mounting

35 mm DIN rail (DIN 50022)

##### Minimum space between relays in the enclosure

0 mm (except for BSR23 which needs 5 mm distance)

#### More information

For more information, e.g. the complete technical information, see product manual:

Sentry [2TLC010002M0201](#)

#### Connection diagrams

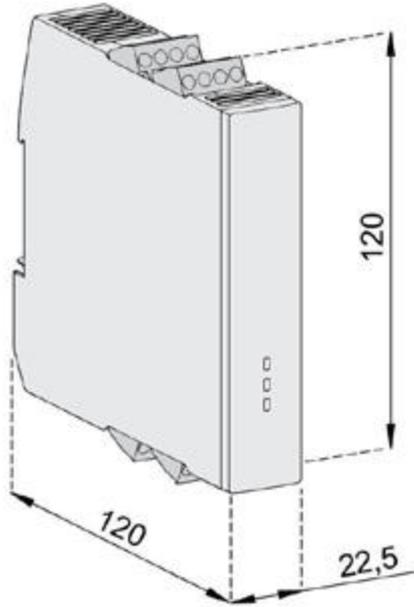
For Sentry connection diagrams please see <https://library.abb.com/>

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## Dimension drawing

Sentry

### Dimension drawing



All dimensions in mm