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 ± 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.

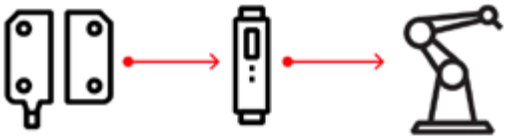
Switch for reset selection
Manual or automatic reset easily selectable by switch.

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

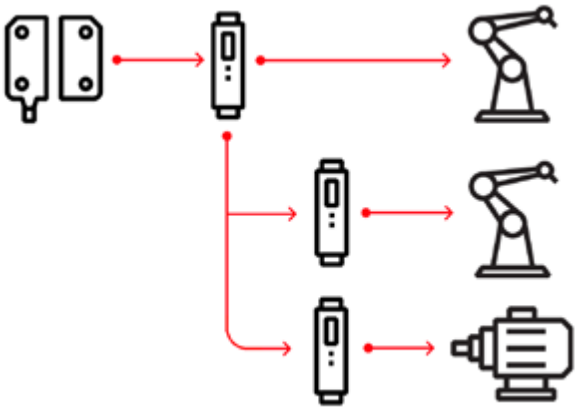
Applications

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

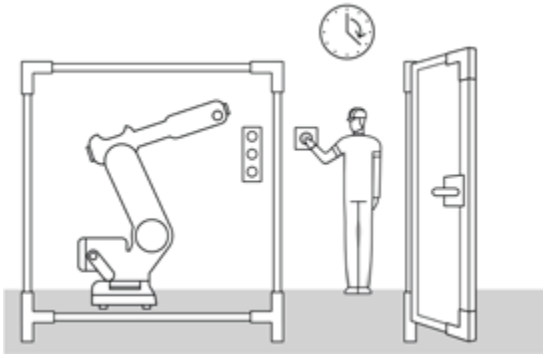
Timer functions with an accuracy of ± 1%
Several timer functions are available: On/Off-delay, time bypass and time reset.

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 ± 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



BSR10



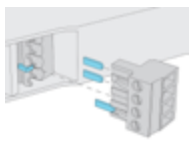
SSR32



USR10



S30A



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 [c]	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 [d]	Configuralble with display	85-265 VAC / 120-375 VDC	+24 VDC		
a)	•	b)						•	•									•	BSR10	2TLA010040R0000
a)	•	b)						•		•								•	BSR11	2TLA010040R0200
a)												•						•	BSR23 [e]	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, $PFH_D = 3.0 \times 10^{-9}$	SIL3, $PFH_D = 4.1 \times 10^{-9}$	SIL3, $PFH_D = 4.9 \times 10^{-9}$	SIL3, $PFH_D = 9.3 \times 10^{-9}$
EN/IEC 62061:2005+A1:2013	SILCL3, $PFH_D = 3.1 \times 10^{-9}$	SILCL3, $PFH_D = 4.1 \times 10^{-9}$	SILCL3, $PFH_D = 4.9 \times 10^{-9}$	SILCL3, $PFH_D = 3.9 \times 10^{-9}$
EN ISO 13849-1:2008	PL e, Cat. 4, $PFH_D = 3.1 \times 10^{-9}$	PL e, Cat. 4, $PFH_D = 4.1 \times 10^{-9}$	PL e, Cat. 4, $PFH_D = 4.9 \times 10^{-9}$	PL e, Cat. 4, $PFH_D = 3.9 \times 10^{-9}$
	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

Fore more information, e.g. the complete technical information, see product manual:
Sentry 2TLC010002M0201

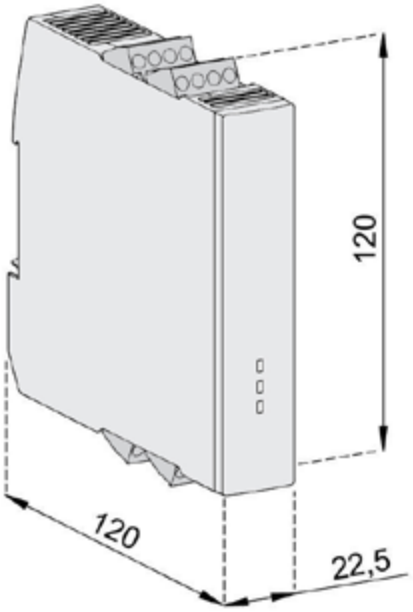
Connection diagrams

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

Dimension drawing

Sentry

Dimension drawing



All dimensions in mm