

Extracts from the original instructions

# TSR20 Sentry safety relay

[EN] The complete original instructions can be found at:  
 [SE] Den kompletta bruksanvisningen i original finns på:  
 [DE] Die komplette Originalbetriebsanleitung ist zu finden unter:  
 [IT] Le istruzioni originali complete si trovano qui:  
 [FR] La notice originale intégrale est disponible sur:  
 [ES] La versión original de las instrucciones está disponible en:  
[www.abb.com/jokabsafety](http://www.abb.com/jokabsafety)

## Product description

TSR20 is a safety relay that has timer functions and configuration possibilities.

## Installation



**WARNING:** The product must be installed by a trained electrician following applicable safety regulations, standards and the machine directive.



**CAUTION:** The safety relay shall be attached on a 35 mm DIN rail in an enclosure that has at least protection class IP54.



**CAUTION:** Make sure there is at least 10 mm distance between the safety relay and other non-Sentry safety relay units to prevent uncontrolled heating.

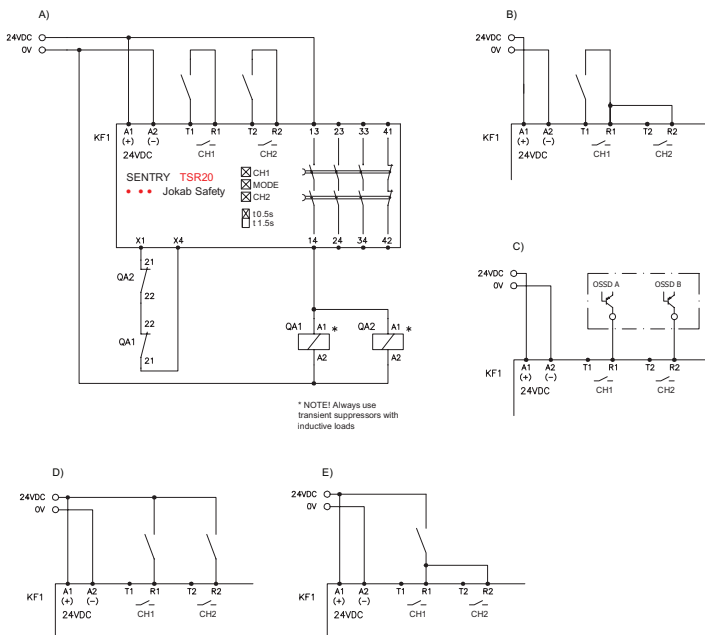


**CAUTION:** Make sure there is at least 50 mm distance above and below the safety relay and other units for correct air flow in the venting holes of the safety relay.

## Connection



**WARNING:** The safety relay and the sensor device for monitoring must be connected to SELV/PELV power supply.



- A. Two signals from T1/T2
- B. One signal from T1
- C. Two OSSD signals
- D. Two signals from +24VDC
- E. One signal from +24VDC

## LED indication

CH1/MODE/CH2	Comment	Action
off/off/off	The safety relay is not powered.	Check A1-A2 voltage and connections.
green/green/green	CH1 and CH2 closed. Reset made and outputs activated.	
off/flash green/off	CH1 and CH2 not close. A timer function is counting down while the safety relay remain activated.	
off/blue/off	No channels closed.	Check CH1 and CH2.
green/blue/green	CH1 and CH2 closed, the safety relay wait for reset.	Check reset wiring and reset circuit.
red/fast flash red/red	The safety relay is in failsafe mode.	Do a power cycling.

## Technical data

Measurements	
Height/width/depth	120 mm/22.5 mm/120 mm
Power supply	
Power supply type	PELV/SELV
Operating voltage	+24 VDC +15 %, -20 %
Consumption	8 W
Required fuse	4 A gG (4 A according to UL 248)
Relay output specification	
Maximum operating switching voltage	250 VAC
Overvoltage category	II
NO contact	
AC load (AC15, AC1), rated operational voltage, current 1/2/3 contact(s)	250 VAC, 5 A/ 5 A/ 4.6 A
DC load (DC13, DC1), rated operational voltage, current 1/2/3 contact(s)	+24 VDC, 6 A/5.6 A/4.6 A
Required fuse	6.3 A gG, 1 kA short circuit protection (6 A according to UL248)
NC contact	
AC load (AC15, AC1), rated operational voltage/current	250 VAC/0.5 A
DC load (DC13, DC1), rated operational voltage/current	+24 VDC/2 A
Required fuse	4 A gG, 1 kA short circuit protection (4 A according to UL248)
Sensor interface specification	
Output T1 and T2	
Maximum output current (current limited internally to typical 70 mA)	50 mA, nom 24 VDC
Input R1 and R2	
Maximum OSSD pulse length	1.0 ms
Input/output (I/O) X4	
Maximum output current (currently limited internally to typical 70 mA)	50 mA



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Connection block and wire properties	
Maximum screw torque	0.8 Nm
Solid conductor, minimum	1 x 24 AWG (0.2 mm <sup>2</sup> ), 2 x 24 AWG (0.2 mm <sup>2</sup> )
Solid conductor, maximum	1 x 12 AWG (3.31 mm <sup>2</sup> ), 2 x 16 AWG (1.31 mm <sup>2</sup> )
Conductor with crimp sleeve, minimum	1 x 24 AWG (0.2 mm <sup>2</sup> ), 2 x 24 AWG (0.2 mm <sup>2</sup> )
Conductor with crimp sleeve, maximum	1 x 12 AWG (3.31 mm <sup>2</sup> ), 2 x 16 AWG (1.31 mm <sup>2</sup> )
Wire strip length	6-7 mm
Maximum response time	
Delay at power on	1.5 s
Response time at activation automatic reset/manual reset	50 ms/50ms
Response time at deactivation	20 ms
Electrical operations life time	
Load $\Sigma I_{th}^2 \leq 64$ , AC1, AC15	160 000 operations
Load $\Sigma I_{th}^2 \leq 64$ , DC1, DC13	100 000 operations
Mechanical operations lifetime	
10 <sup>7</sup> operations	
Environmental data	
Protection class, safety relay	IP20
Protection class, enclosure	At least IP54
Ambient temperature range for operation within specified operation range	-10°C – +65°C
Humidity range for operation	25 % ≤ Rh ≤ 90 %, non-condensing and without icing
Suitable for use at ≤ 2000 metres above sea level.	
Standard compliance and approvals	
Functional safety standard compliance	EN 61508-1:2010, up to SIL3 EN ISO 13849-1:2008, up to PLe/Cat.4 EN 62061:2005, up to SILCL3 EN 61511-1:2003 IEC 60947-5-1
Approvals	CE, TÜV SÜD, cULus
Declaration of conformity	Can be found at: <a href="http://www.abb.com/jokabsafety">www.abb.com/jokabsafety</a>
Information for use in USA/Canada	
Intended use	Applications according to NFPA 79
Power source	A suitable isolating source in conjunction with a fuse in accordance with UL 248
Fuse	The fuse shall be rated max. 4 A and be installed in the +24 VDC power supply to the device in order to limit the available current.

### Maintenance



**WARNING:** The safety functions and mechanics shall be tested every year to confirm that the safety functions work properly.



**WARNING:** Repair and exchange of parts of the safety relay is not permitted since it may accidentally cause permanent damage to the product, impairing safety of the device which in turn could lead to serious injury to personnel. In case of breakdown or damage to the product contact ABB Jokab safety to replace the safety relay with a similar product.

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