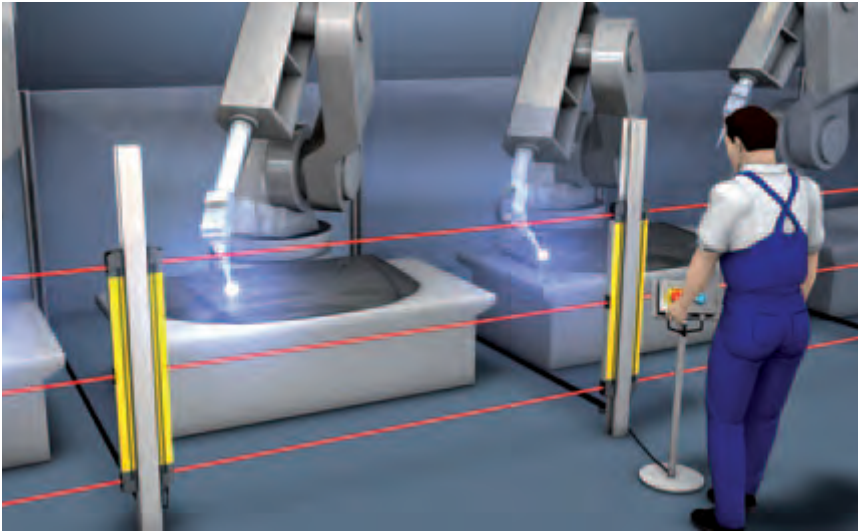


## CONFIGURABLE SAFETY RELAYS

### MSI-s/R, MSI-sx/Rx



*Configurable MSI Safety Relays provide important functions for the efficient flow of automated production processes*

When increased functionality is required in automated production processes, the configurable MSI-s and MSI-sx Safety Relays are preferred over simple Safety Relays. These configurable MSI Safety Relays type 4, in accordance with IEC/EN 61496-1, can be flexibly connected as the link between opto-electronic protective devices and the machine control unit. In addition to standard functions such as start/restart interlock and contactor monitoring they also feature a type 2 test monitoring. The MSI-sx ("extended") model also enables the connection of E-STOP control devices or Safety Switches. Furthermore switching cycles can also be counted and automatically signal when a pre-selected value is reached. Preventive maintenance is possible with this warning in good time before a device failure, which in turn provides additional reliability with regard to system availability.

#### Special features

- Combined guarding types by connecting up to 4 AOPDs
- Additional E-STOP control device or Safety Switch can be connected (MSI-sx/Rx)
- Relay switching cycle counting for preventive maintenance (MSI-sx/Rx)
- Potential-free safety-related switching outputs
- Contact load rating, 5 A
- Plug-in connection terminals and output modules
- Interface for PC-supported diagnostics and easy start-up
- Housing width, 35 mm

#### Typical areas of application

- MSI-s/R as interface module between opto-electronic protective devices, type 4, type 3 or type 2 and the machine control system
- MSI-sx/Rx for systems with combined application of Light Beam Devices, Safety Switches and E-STOP control devices; stop category 0 (IEC 60204-1)

## MSI-s/R, MSI-sx/Rx

### Important technical data, overview

Type in accordance with IEC/EN 61496-1 (Annex A)	Type 4
SIL in accordance with IEC 61508 and SILCL in accordance with IEC/EN 62061	On request
Performance Level (PL) in accordance with EN ISO 13849-1	On request
Category in accordance with EN ISO 13849	Up to 4 (depending on the category of the upstream protective device)
Stop category in accordance with IEC/EN 60204-1	0
Supply voltage	24 V DC, $\pm 20\%$
Response time	22 to 64 ms depending on safety sensor
Safety-related switching outputs (OSSDs)	MSI-s/R: 2 relay outputs (NO) MSI-sx/Rx: 3 relay outputs (2 NO, 1 NC)
Secondary switching device (SSD), only MSI-sx/Rx	Relay output (NO)
Ambient temperature, operation	0...+55°C
Ambient temperature, storage	-25...+70°C
Dimensions (W x H x D)	35 mm x 99 mm x 113.6 mm

### Functions

	MSI-s/R	MSI-sx/Rx
Max. number of type 2 AOPDs or E-STOP control devices (category 2)	2	4
Max. number of type 4 AOPDs or E-STOP control devices (category 4)	1	2
Start/restart interlock (RES), optionally with/without	●	●
Static contactor monitoring (EDM)	●	●
Dynamic contactor monitoring (EDM)	●	●
Cross circuit monitoring	●	●
PC diagnostics interface	●	●
Relay switching cycle counter for preventive maintenance		●
System error signal output		●
Secondary switching device (SSD) – output		●



### Features



### Further information

Further information	Page
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# CONFIGURABLE SAFETY RELAYS

## Ordering information

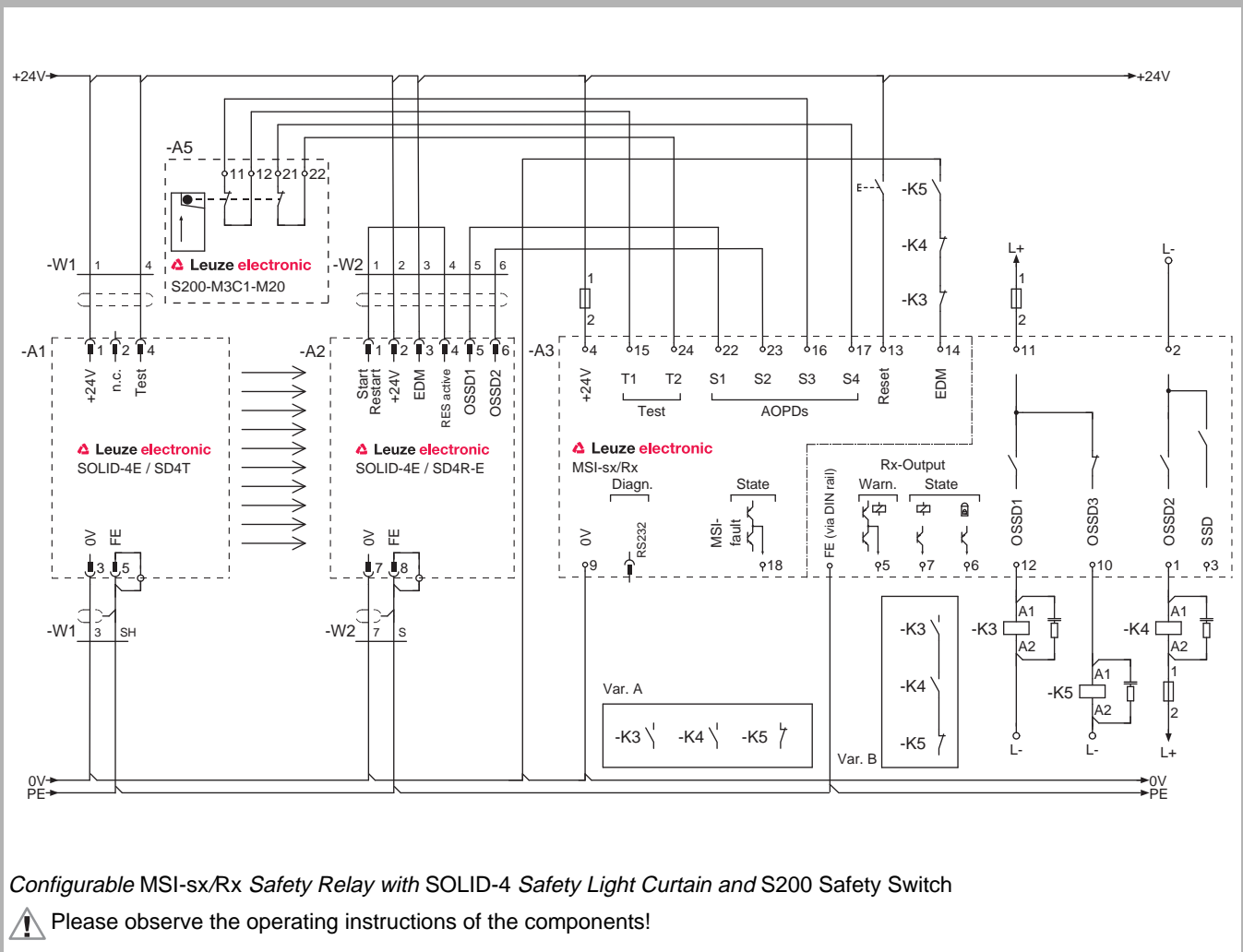
**MSI-s/R, MSI-sx/Rx**  
Included in delivery: Connecting and operating instructions

**Functions:** Start/restart interlock, contactor monitoring, PC diagnostics interface

### MSI-s/R, MSI-sx/Rx

Art. no.	Article	Description	Safety-related switching outputs (OSSDs)
549900	MSI-s/R	Configurable MSI Safety Relay	2 relay outputs
549901	MSI-sx/Rx	Configurable MSI Safety Relay, extended functions	3 relay outputs

### Electrical connection, MSI-sx/Rx connection example



## Technical data

General system data		
Type in accordance with IEC/EN 61496-1 (Annex A)	Type 4	
SIL in accordance with IEC 61508 and SILCL in accordance with IEC/EN 62061	On request	
Performance Level (PL) in accordance with EN ISO 13849-1	On request	
Service life ( $T_M$ ) in accordance with EN ISO 13849-1	On request	
Probability of a failure to danger per hour ( $PFH_d$ ) in accordance with the average number of annual nop activations (for the calculation formula, see EN ISO 13849-1:2008, chapter C.4.2 and C.4.3)	nop = 4,800	On request
	nop = 28,800	On request
	nop = 86,400	On request
Number of cycles until 10 % of the components have a failure to danger ( $B_{10d}$ )	With DC1 (ohmic load)	On request
	With AC1 (ohmic load)	
	With DC13 (inductive load)	
	With AC15 (inductive load)	
	Low load (20% nominal load)	
Category in accordance with EN ISO 13849	Up to 4 (depending on the category of the upstream protective device)	
Stop category in accordance with IEC/EN 60204-1	0	
Supply voltage	24 V DC, $\pm 20\%$	
Response time	22 ms with connection of type 4 AOPD with transistor output 64 ms with connection of type 4 AOPD with relay output 64 ms with connection of type 2 AOPD 64 ms with connection of Safety Switches (electro-mechanical)	
Restart delay time	100 ms	
Safety class	II	
Protection rating	IP 20	
Ambient temperature, operation	0...+55°C	
Ambient temperature, storage	-25...+70°C	
Relative humidity	Max. 93 %	
Dimensions (W x H x D)	35 mm x 99 mm x 113.6 mm	
Mounting	on 35 mm DIN rail	
Connection system	Plug-in, encoded screw terminals up to 2.5 mm <sup>2</sup>	
Current consumption	Approx. 200 mA without external load	
Safety-related switching outputs (OSSDs)	MSI-s/R: 2 relay outputs (NO) MSI-sx/Rx: 3 relay outputs (2 NO, 1 NC)	
Secondary switching device (SSD), only MSI-sx/Rx	Relay output (NO)	
Switching voltage, switching current (for OSSDs)	60 V DC, 250 V AC, 5 A maximum, 20 mA minimum	
Test outputs T1 and T2	Test interval, 200 ms Test pulse width delayed, 24 ms each Response time, type 2 AOPD on test request, 2...18 ms	
Control inputs		
Start/restart interlock (RES)	Potential-free NO contact (button or key switch)	
Contact monitoring (EDM)	Feedback of positive-guided contacts of sequential contactors	

## CONFIGURABLE SAFETY RELAYS

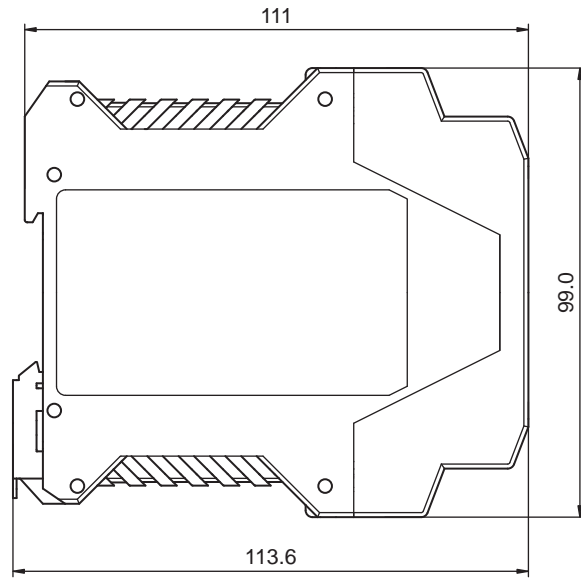
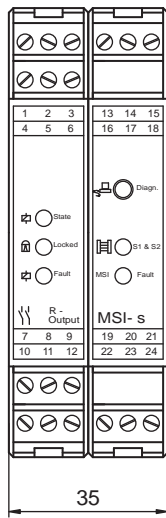
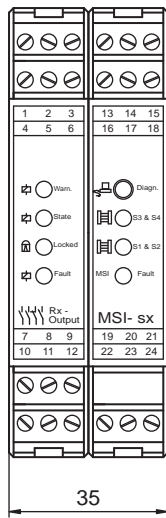
### Technical data

Signal outputs	
OSSD status	pnp transistor output
Start/restart interlock status	pnp transistor output
Additional signal outputs MSI-sx/Rx	
MSI error	Push-pull transistor output
Pre-selected switching cycles reached	Push-pull transistor output
Connectable safety sensors	
Safety sensors (AOPDs)	MSI-s/R: 1 type 4 or type 3 AOPD or up to 2 type 2 AOPDs MSI-sx/Rx: Up to 2 type 4 or type 3AOPDs or up to 4 type 2 AOPDs
Safety Switch/E-STOP control device	MSI-s/R: Up to 2 Safety Switches in accordance with EN 1088 and E-STOP command device in accordance with EN ISO 13850 MSI-sx/Rx: Up to 4 Safety Switches in accordance with EN 1088 and E-STOP command device in accordance with EN ISO 13850

Please note the additional information in the connecting and operating instructions and at [www.leuze.com/interfaces](http://www.leuze.com/interfaces).

**Dimensional drawings**

**Configurable MSI-s/R and MSI-sx/Rx Safety Relays**



Dimensions in mm

Our 3D CAD models can be found under: [www.leuze.com/3d-cad-models](http://www.leuze.com/3d-cad-models).

## CONFIGURABLE SAFETY RELAYS

### Accessories ordering information

Art. no.	Article	Description	Length, design
<b>Diagnostics set</b>			
549932	MSI-SWC	MSI diagnostics set contains: MSI diagnostics software*, Ger/Eng user's guide, diagnostics cable, 3 m	
<b>Diagnostics cable</b>			
549953	CB-MSI/D9-3000	Diagnostics connecting cable	3 m
549955	CB-MSI/D9-5000	Diagnostics connecting cable	5 m
549950	CB-MSI/D9-10000	Diagnostics connecting cable	10 m
<b>Power supplies</b>			
520061	LOGO! Power	Power supply, 120/230 V AC --> 24 V DC / 1.3 A, regulated	

**\*) MSI diagnostics software**

All configurable MSI Safety Relays have an RS 232 diagnostics interface for the PC-supported visualization of input and output states, and internal system states. This allows wiring and cabling errors, insufficient input information and the system status to be quickly and easily detected. You will find more information at [www.leuze.com/interfaces](http://www.leuze.com/interfaces).