

CONFIGURABLE SAFETY RELAYS

MSI-mE/R, MSI-mxE/Rx



Configurable MSI-mE Safety Relays with UL approval for Muting procedures with the use of a wrapping machine

The configurable MSI-mE or MSI-mxE Safety Relay type 4, in accordance with IEC/EN 61496-1, has an identical scope of functions to the MSI-m/R and MSI-mx/Rx Muting interfaces and meets the increased temperature requirements of UL 508.

Typical areas of application

- MSI-mE for Muting (bridging the protective device during the material transport) at entry or exit of automated production cells
- MSI-mxE as Muting system solution for connecting Light Beam Devices, hanging flaps and E-STOP control devices
- Packaging machinery, palletizers, production cells in the automotive industry

Special features

- UL and CSA certified
- Sequential Muting or Parallel Muting with automatic mode detection
- MSI-mx for separate Muting of two AOPDs and connection of additional Safety Switch
- Standard initiators, Light Beam Devices or limit switch can be connected as Muting sensors
- 2 monitored Muting indicators, warning output with Muting indicator failure
- Potential-free safety-related switching outputs
- Plug-in connection terminals and output modules
- Interface for PC-supported diagnostics function for fast start-up
- Housing width, 53 mm

MSI-mE/R, MSI-mxE/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, ±20 %
Response time	22 to 64 ms depending on safety sensor
Safety-related switching outputs (OSSDs)	MSI-mE/R: 2 relay outputs (NO) MSI-mxE/Rx: 3 relay outputs (2 NO, 1 NC)
Secondary switching device (SSD), only MSI-mxE/Rx	Relay output (NO)
Ambient temperature, operation	0...+55 °C
Ambient temperature, storage	-25...+70 °C
Dimensions (W x H x D)	70 mm x 99 mm x 113.6 mm

Functions

	MSI-mE/R	MSI-mxE/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
Additional connectable Safety Switch (category 4)	0	2
Start/restart interlock (RES), optionally with/without	●	●
Static contactor monitoring (EDM)	●	●
Dynamic contactor monitoring (EDM)	●	●
Cross circuit monitoring	●	●
PC diagnostics interface	●	●
Sequential Muting	●	●
Parallel Muting	●	●
Double Parallel Muting on two areas	●	●
Muting time monitoring (select/deselect)	●	●
Warning, defective Muting indicator	●	●
Muting signal output		●
Relay switching cycle counter for preventive maintenance		●
System error signal output		●
Secondary switching device (SSD) – output		●



Features



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CONFIGURABLE SAFETY RELAYS

Ordering information

MSI-mE/R, MSI-mxE/Rx

Included in delivery: Connecting and operating instructions

Functions: Muting, start/restart interlock, contactor monitoring, PC diagnostics interface

MSI-mE/R, MSI-mxE/Rx

Art. no.	Article	Description	Safety-related switching outputs (OSSDs)
549980	MSI-mE/R	Configurable MSI Safety Relay, Muting, UL/CSA, ext. temperature range. 60°C	2 relay outputs
549982	MSI-mxE/Rx	Configurable MSI Safety Relay, Muting, extended functions, UL/CSA, ext. temperature range 60°C	3 relay outputs

Electrical connection

The connection example corresponds to the configurable MSI-m/R and MSI-mx/Rx Safety Relay on page 467.

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)	70 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 ²	
Current consumption	Approx. 200 mA without external load	
Safety-related switching outputs (OSSDs)	MSI-mE/R: 2 relay outputs (NO) MSI-mxE/Rx: 3 relay outputs (2 NO, 1 NC)	
Outputs, Muting displays	2 pnp transistor outputs for lamps, 24 V DC/max. 5 W LED indicator, 24 V DC/0.5 W to 5 W	
Secondary switching device (SSD), only MSI-mxE/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	

CONFIGURABLE SAFETY RELAYS

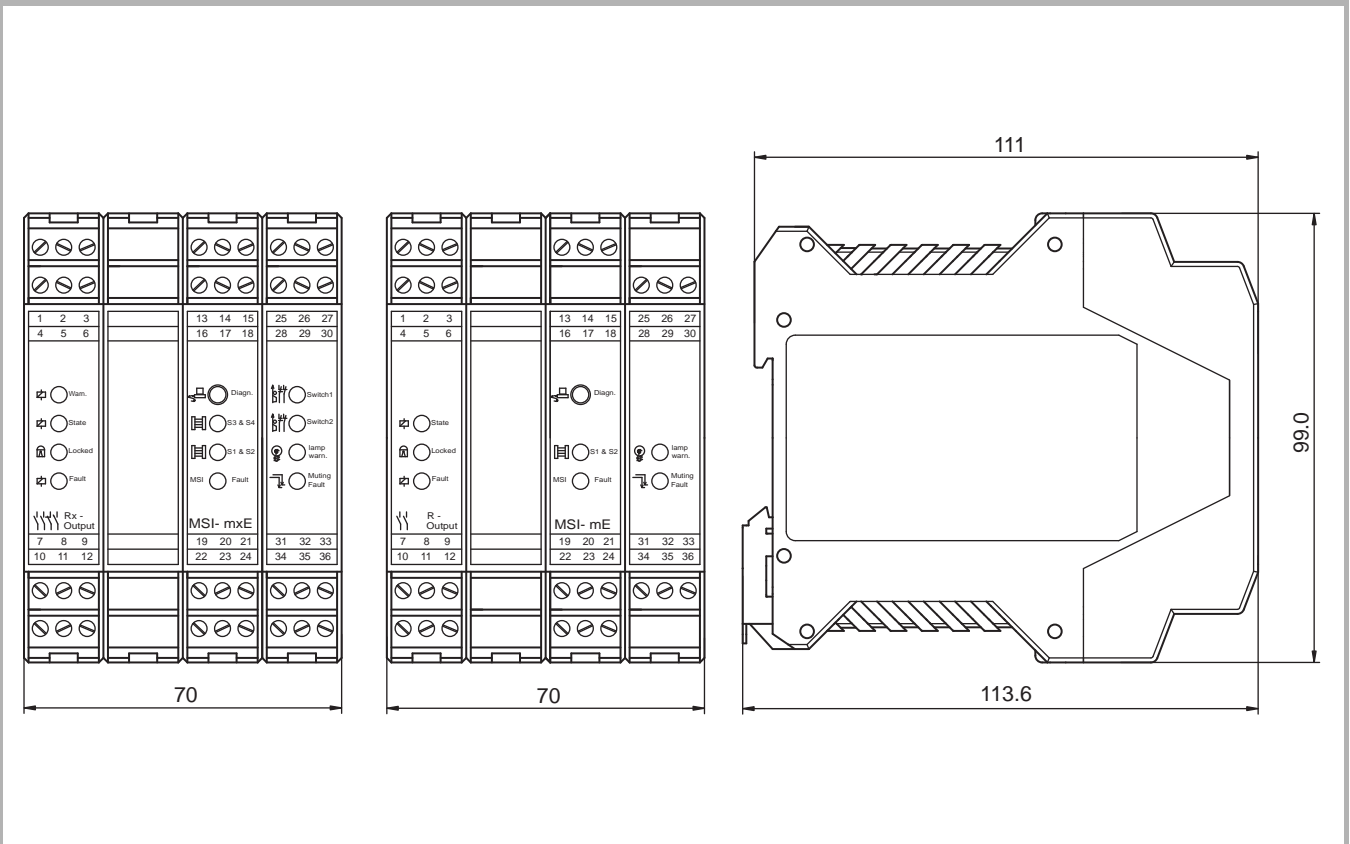
Technical data

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
Muting sensors M1 – M4 (separate connecting cables required)	Muting sensors, not testable Muting sensors, testable (response time 2...18 ms)
Signal outputs	
OSSD status	pnp transistor output
AOPDs status	pnp transistor output
Start/restart function status (RES)	pnp transistor output
Status, Muting error	Push-pull transistor output
Additional signal outputs MSI-mxE/Rx	
MSI error	Push-pull transistor output
Status, Muting	pnp transistor output
Status, Safety Switch	pnp transistor output
Pre-selected switching cycles reached	Push-pull transistor output
Muting indicator, defective	Push-pull transistor output
Connectable safety sensors	
Safety sensors (AOPDs)	MSI-mE/R: 1 type 4 or type 3 AOPD or up to 2 type 2 AOPDs MSI-mxE/Rx: Up to 2 type 4 or type 3AOPDs or up to 4 type 2 AOPDs
Safety Switch/E-STOP control device	MSI-mxE/Rx: Up to 3 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.

Dimensional drawings

Configurable MSI-mE/R and MSI-mxE/Rx Safety Relays



Dimensions in mm

Our 3D CAD models can be found under: www.leuze.com/3d-cad-models.

Accessories ordering information

See page 456.