SMART
SENSOR
BUSINESS

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Part no.: 547959
MSI-TR1B-02
Safety relay

Contents

Part no.: 547959 – MSI-TR1B-02 – Safety relay

Technical data

Basic data	
Series	MSI-TB

Functions	
Functions	"Safety ON" signal output "Error" signal output Start/restart interlock (RES), selectable Periodic function test Contactor monitoring (EDM), selectable
Restart	Manual Automatic

Characteristic parameters	
Type	2, IEC/EN 61496
Performance Level (PL)	Up to c, EN ISO 13849-1
$MTTF_d$	78 years, EN ISO 13849-1
PFH_D	0.000000088 per hour
PFH_D	8.8E-08 per hour
Mission time T_M	20 years, EN ISO 13849-1
Category	2, EN ISO 13849

Electrical data	
Protective circuit	Polarity reversal protection Short circuit protected

Performance data	
Supply voltage	24 V, DC, -20 ... 20 %
Current consumption, max.	200 mA, Without external load
Residual ripple	-15 ... 15 %
Fuse	External with max. 3.15 A semi time-lag

Inputs	
Number of digital switching inputs	4 Piece(s)

Switching inputs	
Type	Digital switching input
Switching voltage high, min.	18.2 V
Switching voltage low, max.	2.5 V
Switching voltage, typ.	23 V
Voltage type	DC

Digital switching input 1	
Function	Control input for contactor monitoring (EDM)
Digital switching input 2	
Function	Control input for receiver
Digital switching input 3	
Function	RES/Start control input
Digital switching input 4	
Function	Control input for Reset
Digital switching input 5	
Function	Restart interlock control input

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Outputs	
Number of safety-related switching outputs (OSSDs)	2 Piece(s)
Number of digital switching outputs	3 Piece(s)
Safety-related switching outputs	
Type	Safety-related switching output OSSD
Voltage type	DC
Current load, max.	2,000 mA
Safety-related switching output 1	
Switching element	Relay, NO
Safety-related switching output 2	
Switching element	Relay, NO
Switching outputs	
Type	Digital switching output
Switching voltage high, min.	18.2 V
Switching voltage low, max.	2.5 V
Switching voltage, typ.	23 V
Voltage type	DC
Switching output 1	
Switching element	Transistor, PNP
Function	"Safety ON" signal output
Switching output 2	
Switching element	Transistor, PNP
Function	"Error" signal output
Switching output 3	
Switching element	Transistor, PNP
Function	Test signal output (transmitter)

Timing	
Response time	20 ms
Start-up delay	2 s
Sensor response time on test request	0.5 ... 60 ms

Connection	
Number of connections	1 Piece(s)
Connection 1	
Type of connection	Terminal
Function	Voltage supply Connection to device
Type of terminal	Spring-cage terminal
No. of pins	16 -pin
Cable properties	
Connection cross sections	0.2 to 1.5 mm²

Mechanical data	
Dimension (W x H x L)	22.5 mm x 111 mm x 114.1 mm
Housing material	Plastic, Unreinforced polyamide PA
Net weight	200 g
Housing color	Gray
Type of fastening	Snap-on mounting

Operation and display	
Type of display	LED
Number of LEDs	4 Piece(s)

Environmental data	
Ambient temperature, operation	-30 ... 60 °C
Ambient temperature, storage	-40 ... 70 °C
Relative humidity (non-condensing)	0 ... 95 %

Certifications	
Degree of protection	IP 40
Protection class	II
Certifications	TÜV Süd c TÜV Rheinland US
US patents	US 6,418,546 B

Classification	
eCl@ss 8.0	27371819
eCl@ss 9.0	27371819
ETIM 5.0	EC001449

Electrical connection

Connection 1	
Type of connection	Terminal
Function	Voltage supply Connection to device
Type of terminal	Spring-cage terminal
No. of pins	16 -pin

Terminal	**Assignment**
5	+24V
6	GND
7	Safety ON
8	ERROR
13	EDM
14	Test (transmitter)
15	Receiver
16	RES/Start
21	Reset
22	WA
23	MODE
24	Auto WA
29	OSSD1
30	OSSD2
31	SSD1
32	SSD2

Operation and display

LEDs

LED	Display	Meaning
1	Green, continuous light	Light path free
2	Yellow, continuous light	Restart locked
3	Green, continuous light	EDM selected
4	Green, continuous light	OSSD on
	Red, continuous light	OSSD off