

## Technical data sheet

### Safety relay

Part no.: 547959

MSI-TR1B-02

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For illustration purposes only



## Technical data

### Basic data

Series	MSI-TB
Application	Evaluation unit for type 2 single beam safety devices in accordance with IEC/EN 61496

### Functions

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

### Characteristic parameters

Type	2, IEC/EN 61496
SIL	1, IEC 61508
SILCL	1, IEC/EN 62061
Performance Level (PL)	c, EN ISO 13849-1
MTTF <sub>d</sub>	78 years, EN ISO 13849-1
PFH <sub>D</sub>	8.8E-08 per hour
Mission time T <sub>M</sub>	20 years, EN ISO 13849-1
Category	2, EN ISO 13849-1

### Electrical data

Protective circuit	Polarity reversal protection Short circuit protected
Continuous current per current path, max.	2 A

### Performance data

Supply voltage U <sub>B</sub>	24 V, DC, -20 ... 20 %
Current consumption, max.	200 mA, Without external load
Power consumption, max.	4.8 W
Residual ripple	-15 ... 15 %
Fuse	External with max. 3.15 A semi time-lag

### Inputs

Number of digital switching inputs	4 Piece(s)
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### Switching inputs

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

### Digital switching input 1

Function	Control input for contactor monitoring (EDM)
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### Digital switching input 2

Function	Control input for receiver
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### Digital switching input 3

Function	RES/Start control input
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### Digital switching input 4

Function	Control input for Reset
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### Digital switching input 5

Function	Restart interlock control input
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### Outputs

Number of safety-related switching outputs (OSSDs)	2 Piece(s)
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Number of digital switching outputs	3 Piece(s)
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### 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
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### Safety-related switching output 2

Switching element	Relay, NO
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### Switching outputs

Type	Digital switching output
Switching voltage high, min.	18.2 V
Switching voltage low, max.	2.5 V
Switching voltage, type.	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)

### Output circuit

Number of outputs, safety-oriented, non-delayed, contact-based	2 Piece(s)
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Number of outputs, safety-oriented, delayed, contact-based	0 Piece(s)
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Number of outputs, signaling function, non-delayed, contact-based	0 Piece(s)
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### Time behavior

Response time	20 ms
Switch-on delay	2 s
Regression delay	20 ms
Sensor response time on test request	0.5 ... 60 ms

### Connection

Number of connections	1 Piece(s)
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### Connection 1

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

### Cable properties

Connection cross sections	0.2 to 1.5 mm <sup>2</sup>
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## Technical data

### Mechanical data

Dimension (W x H x L)	22.5 mm x 111 mm x 114.1 mm
Housing material	Plastic
Plastic housing	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
Approvals	TÜV Süd
US patents	US 6,418,546 B

### Classification

Customs tariff number	85371098
ECLASS 5.1.4	27371800
ECLASS 8.0	27371819
ECLASS 9.0	27371819
ECLASS 10.0	27371819
ECLASS 11.0	27371819
ECLASS 12.0	27371819
ECLASS 13.0	27371819
ECLASS 14.0	27371819
ECLASS 15.0	27371819
ECLASS 16.0	27371819
ETIM 5.0	EC001449
ETIM 6.0	EC001449
ETIM 7.0	EC001449
ETIM 8.0	EC001449
ETIM 9.0	EC001449
ETIM 10.0	EC001449

## Electrical connection

### Connection 1

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

### Terminal

### Assignment

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

## Operation and display

LED	Display	Meaning
1	Green, continuous light	Light path free
2	Yellow, continuous light	Restart locked
3	Green, continuous light	EDM selected

## Operation and display

LED	Display	Meaning
4	Green, continuous light	OSSD on
	Red, continuous light	OSSD off