

## Technical data sheet

### Safety relay

Part no.: 50133022

MSI-SR-ES31-01

#### Contents

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- Dimensioned drawings
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For illustration purposes only



Technical data

Basic data

|             |                                         |
|-------------|-----------------------------------------|
| Series      | MSI-SR-ES31                             |
| Application | E-Stop circuits                         |
|             | Position switches (mechanical contacts) |

Functions

|           |                               |
|-----------|-------------------------------|
| Functions | Contactor monitoring (EDM)    |
|           | Start/restart interlock (RES) |
| Restart   | Automatic                     |
|           | Manual                        |

Characteristic parameters

|                                           |                                                                 |
|-------------------------------------------|-----------------------------------------------------------------|
| SIL                                       | 2, IEC 61508                                                    |
| SILCL                                     | 2, IEC/EN 62061                                                 |
| Performance Level (PL)                    | d, EN ISO 13849-1                                               |
| MTTF <sub>d</sub>                         | 73 years, EN ISO 13849-1                                        |
| PFH <sub>D</sub>                          | 8,6E-10 per hour                                                |
| Mission time T <sub>M</sub>               | 20 years, EN ISO 13849-1                                        |
| Category                                  | 3, EN ISO 13849-1                                               |
| DC <sub>AVG</sub>                         | 99 %                                                            |
| B10 <sub>d</sub> at DC13 (inductive load) | 300,000 number of cycles, (5 A, 230 V),<br>700,000 (1 A, 230 V) |
| B10 <sub>d</sub> at AC15 (inductive load) | 200,000 number of cycles, (5 A, 230 V),<br>380,000 (1 A, 230 V) |

Electrical data

|                                                       |                                                    |
|-------------------------------------------------------|----------------------------------------------------|
| Continuous current per current path, max.             | 8 A                                                |
| Performance data                                      |                                                    |
| Supply voltage U <sub>B</sub>                         | 24 V, AC/DC, -15 ... 10 %                          |
| Power consumption, max.                               | 1.3 W                                              |
| Supply circuit                                        |                                                    |
| Nominal voltage U <sub>N</sub>                        | 24 V                                               |
| Nominal frequency                                     | 50 ... 60 Hz                                       |
| Operating voltage                                     | 0.85 ... 1.1 x U <sub>N</sub>                      |
| Rated power DC                                        | 1.3 W                                              |
| Galvanic isolation between supply and control circuit | Yes (when U <sub>N</sub> ≥ AC 115-120 V, AC 230 V) |

Output circuit

|                                                                           |                                           |
|---------------------------------------------------------------------------|-------------------------------------------|
| Number of outputs, safety-oriented, non-delayed, contact-based            | 3 Piece(s)                                |
| Number of outputs, safety-oriented, delayed, contact-based                | 0 Piece(s)                                |
| Number of outputs, signaling function, non-delayed, contact-based         | 1 Piece(s)                                |
| Release current paths                                                     | NO                                        |
| Signaling current paths                                                   | NC                                        |
| Contact material                                                          | Ag alloy, gold-plated                     |
| Usage category AC-15 (NO contact)                                         | Ue 230V, Ie 5A                            |
| Usage category DC-13 (NO contact)                                         | Ue 24V, Ie 5A                             |
| Short circuit protection (NO contact)                                     | gG class safety fuse 6A, melting integral |
| Nominal switching voltage, release current paths AC                       | 230 V                                     |
| Nominal switching voltage, signaling current paths AC                     | 230 V                                     |
| Max. thermal continuous current I <sub>th</sub> , release current paths   | 8 A                                       |
| Max. thermal continuous current I <sub>th</sub> , signaling current paths | 5 A                                       |
| Max. total current I <sup>2</sup> of all current paths                    | 9 A <sup>2</sup>                          |
| Mechanical life time                                                      | 100,000,000 switching cycles              |

Control circuit

|                                                                        |                                                               |
|------------------------------------------------------------------------|---------------------------------------------------------------|
| Evaluation of the inputs                                               | one- or two-channel                                           |
| Nominal output voltage DC                                              | 24 V                                                          |
| Input current at the control inputs (safety circuit/reset circuit)     | 90 mA                                                         |
| Max. peak current at the control inputs (safety circuit/reset circuit) | 1,500 mA                                                      |
| Max. cable resistance, per channel                                     | ≤ (5 + (1.333 x U <sub>B</sub> / U <sub>N</sub> - 1) x 200) Ω |
| Minimum switch-on time                                                 | 60 ms                                                         |
| Response time (automatic start t <sub>A2</sub> )                       | 60 ms                                                         |
| Release time t <sub>R</sub>                                            | 60 ms                                                         |
| Recovery time t <sub>W</sub>                                           | 200 ms                                                        |

Time behavior

|                  |       |
|------------------|-------|
| Regression delay | 60 ms |
|------------------|-------|

Connection

|                       |            |
|-----------------------|------------|
| Number of connections | 1 Piece(s) |
|-----------------------|------------|

Connection 1

|                    |                |
|--------------------|----------------|
| Function           | Signal IN      |
|                    | Signal OUT     |
|                    | Voltage supply |
| Type of connection | Terminal       |
| Type of terminal   | Screw terminal |
| No. of pins        | 15 -pin        |

Cable properties

|                           |                                                             |
|---------------------------|-------------------------------------------------------------|
| Connection cross sections | 1 x 0.2 to 2.5 mm <sup>2</sup> , wire                       |
|                           | 1 x 0.2 to 2.5 mm <sup>2</sup> , wire                       |
|                           | 1 x 0.25 to 2.5 mm <sup>2</sup> , wire with wire-end sleeve |
|                           | 2 x 0.2 to 1.0 mm <sup>2</sup> , wire                       |
|                           | 2 x 0.2 to 1.0 mm <sup>2</sup> , wire                       |
|                           | 2 x 0.25 to 1.0 mm <sup>2</sup> , wire with wire-end sleeve |

Technical data

Mechanical data

|                       |                            |
|-----------------------|----------------------------|
| Dimension (W x H x L) | 22.5 mm x 96.5 mm x 114 mm |
| Net weight            | 200 g                      |
| Housing color         | Gray                       |
| Type of fastening     | Snap-on mounting           |

Environmental data

|                                |               |
|--------------------------------|---------------|
| Ambient temperature, operation | -25 ... 55 °C |
|--------------------------------|---------------|

Certifications

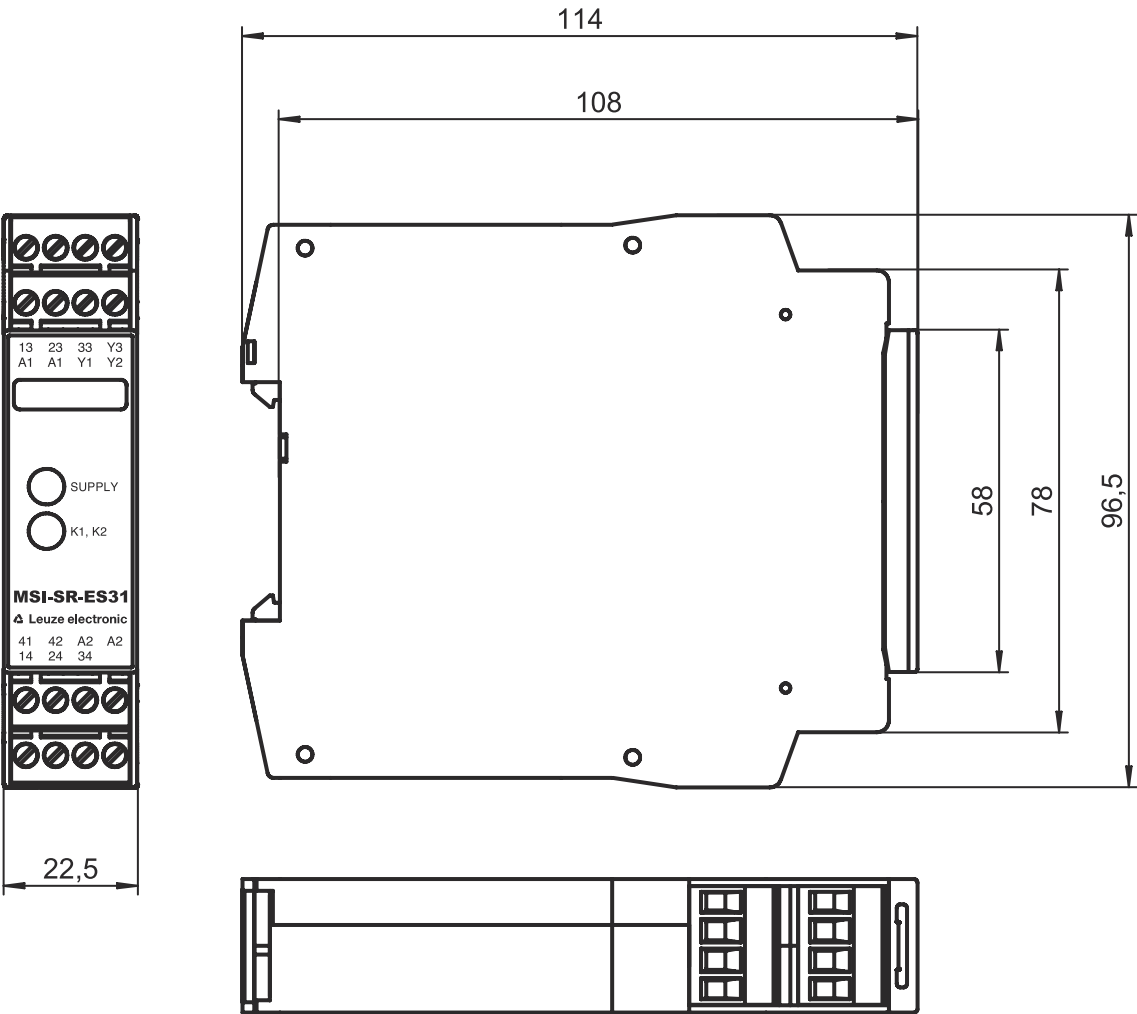
|           |               |
|-----------|---------------|
| Approvals | c UL US       |
|           | TÜV Rheinland |

Classification

|                       |          |
|-----------------------|----------|
| Customs tariff number | 85364900 |
| 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 |
| ETIM 5.0              | EC001449 |
| ETIM 6.0              | EC001449 |
| ETIM 7.0              | EC001449 |
| ETIM 8.0              | EC001449 |
| ETIM 9.0              | EC001449 |
| ETIM 10.0             | EC001449 |

Dimensioned drawings

All dimensions in millimeters



Electrical connection

Connection 1

|                    |                |
|--------------------|----------------|
| Function           | Signal IN      |
|                    | Signal OUT     |
|                    | Voltage supply |
| Type of connection | Terminal       |
| Type of terminal   | Screw terminal |
| No. of pins        | 15 -pin        |

Terminal

Assignment

|    |                                     |
|----|-------------------------------------|
| 13 | Release current path 1 (NO contact) |
| 14 | Release current path 1 (NO contact) |
| 23 | Release current path 2 (NO contact) |
| 24 | Release current path 2 (NO contact) |
| 33 | Release current path 3 (NO contact) |
| 34 | Release current path 3 (NO contact) |

