### MSR142RTP

### Description

The MSR142RTP is a versatile monitoring safety relay. It can be connected in four different input wiring configurations: one normally closed, two normally closed, two PNP connections from a light curtain, or a four-wire safety mat. When connected in the two normally closed fashion, the MSR142RTP checks for cross faults across the two inputs. When connected to light curtains, the light curtain must perform the cross-fault detection.

The MSR142RTP has output monitoring that can accommodate either automatic/manual reset or a monitored manual reset. When configured with automatic/manual reset (jumpers on X1-X2 and X3-X4), the MSR142RTP can have the reset terminals S33-S34 jumpered or can be converted to an unmonitored manual reset by adding a normally open switch in the monitoring loop (S33-S34). When configured to monitored manual reset, the MSR142RTP checks the output monitoring circuit through the manual application of the reset switch.



The outputs include seven normally open safety-rated outputs, four normally closed auxiliary outputs, and two solid-state output indicates that the inputs are closed. The second solid-state output indicates that the safety outputs are active. The safety outputs have independent and redundant internal contacts to support the safety function. The auxiliary outputs are nonsafety outputs intended to provide an external signal about the status of the safety outputs.

#### **Features**

- Category 4 per EN 954-1
- Stop category 0
- · Light curtain, safety mat, E-stop inputs
- Seven electromechanical N.O. state safety outputs
- Four electromechanical N.C. auxiliary outputs
- Two solid-state auxiliary outputs
- · Cross-fault monitoring
- · Monitored or automatic reset
- Removable terminals

#### **LED Indicators**

| Green | Power                |
|-------|----------------------|
| Green | Start                |
| Green | CH1 IN               |
| Green | CH2 IN               |
| Green | CH1 output energized |
| Green | CH2 output energized |

### **Specifications**

| Safety Ratings   |   |  |  |  |  |  |
|--|---|--|--|--|--|--|
| Standards  | EN 954-1, ISO 13849-1, IEC/EN 60204-1, IEC 60947-5-1, AS 4042.1, ISOTR 12100, B11.19  |  |  |  |  |  |
| Safety Classification  | Cat. 4 per EN 954-1 (ISO 13849-1), SIL CL3 per EN IEC 62061, PLe per ISO 13849-1  |  |  |  |  |  |
| Functional Safety Data * Note: For up-to-date information, visit http://www.ab.com/safety/ | PFH <sub>D</sub> : < 1.92 x 10-9  MTTFd: > 210 years Suitable for performance levels Ple (according to ISO 13849-1:2006) and for use in SIL3 systems (according to IEC 62061) depending on the architecture and application characteristics |  |  |  |  |  |
| Certifications   | CE Marked for all applicable directives, cULus, TÜV, and c-Tick   |  |  |  |  |  |
| Power Supply   |   |  |  |  |  |  |
| Input Power Entry  | 24V AC/DC, 115V AC or 230V AC 50/60 Hz  |  |  |  |  |  |
| Power Consumption  | 5 W   |  |  |  |  |  |
| Inputs   |   |  |  |  |  |  |
| Safety Inputs  | 1 N.C., 2 N.C., Light Curtain or 4-Wire Safety Mat  |  |  |  |  |  |
| Input Simultaneity   | Infinite  |  |  |  |  |  |
| Input Resistance, Max.   | 45 ohms   |  |  |  |  |  |
| Reset  | Auto./Manual or Monitored Manual  |  |  |  |  |  |
| Power On Delay/<br>Recovery Time   | 1 s/100 ms  |  |  |  |  |  |
| Response Time  | 15 ms   |  |  |  |  |  |
| Outputs  |   |  |  |  |  |  |
| Safety Contacts  | 7 N.O.  |  |  |  |  |  |
| Auxiliary Contacts   | 4 N.C., 2 PNP   |  |  |  |  |  |
| Rated Impulse withstand Voltage  | 2500V   |  |  |  |  |  |
| Switching Current @ Voltage, Min.  | 10 mA @ 10V DC  |  |  |  |  |  |
| Fuses, Output  | 6 A slow blow or 10 A quick blow (external)   |  |  |  |  |  |
| Electrical Life (Operations)   | 220V AC/4 A/880VA cosφ = 0.350.1 M<br>220V AC/1.7 A/375VA cosφ = 0.60.5 M<br>30V DC/2 A/60 W = 1 M<br>10V DC/0.01 A/0.1 W = 2 M   |  |  |  |  |  |
| Mechanical Life  | 2,000,000 operations  |  |  |  |  |  |
| Utilization Category   |   |  |  |  |  |  |
| Inductive: Safety & Aux.: AC-15  | 6 A/250V AC   |  |  |  |  |  |
| Inductive: AC-13   | 3 A/24V DC  |  |  |  |  |  |
| Resistive: DC-13   | 20 mA/30V DC short-circuit protected  |  |  |  |  |  |
| UL   | 4 x B300 or 7 x 4 A Resistive   |  |  |  |  |  |
| Environmental and Physical Characteristics   |   |  |  |  |  |  |
| Enclosure Type Rating/<br>Terminal Protection  | IP40 (NEMA 1), DIN VDE 0470-1/<br>IP20  |  |  |  |  |  |
| Operating Temperature [C (F)]  | -5+55 ° (14131 °)   |  |  |  |  |  |
| Vibration  | 1055 Hz, 0.35 mm  |  |  |  |  |  |
| Shock  | 10 g, 16 ms, 100 shocks   |  |  |  |  |  |
| Mounting   | 35 mm DIN Rail  |  |  |  |  |  |
| Weight [g (lb)]  | 24V: 470 (1.04); 115/230V AC: 607 (1.34)  |  |  |  |  |  |
|  |   |  |  |  |  |  |

\* Usable for ISO 13849-1:2006 and IEC 62061. Data is based on the following assumptions:

- Mission time/Proof test interval of 20 years

- Functional test at least once within six-month period

0.2...4 mm<sub>2</sub> (24...12 AWG)

### **Product Selection**

Conductor Size, Max.

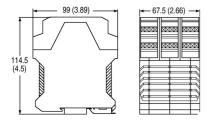
| Inputs                                    | Safety Outputs | Auxiliary Outputs          | Terminals | Reset Type                      | Power Supply | Cat. No.    |
|---|----------------|----------------------------|-----------|---------------------------------|--------------|-------------|
| 1 N.C., 2 N.C., Light Curtain, Safety Mat | 7 N.O.         | 4 N.C., 2 PNP, solid state | Removable | Monitored Manual or Auto/Manual | 24V AC/DC    | 440R-G23216 |
|   |                |                            |           |                                 | 115V AC      | 440R-G23215 |
|   |                |                            |           |                                 | 230V AC      | 440R-G23214 |

### Accessories

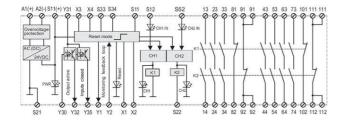
| Description                                  | Cat. No.    |  |  |
|--|-------------|--|--|
| Bag of 4, 4-Pin Screw Terminal Blocks        | 440R-A23209 |  |  |
| Bag of 4, 4-Pin Spring Clamp Terminal Blocks | 440R-A23228 |  |  |

# **Approximate Dimensions**

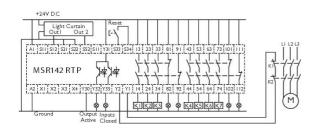
Dimensions are shown in mm (in.). Dimensions are not intended to be used for installation purposes.

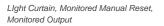


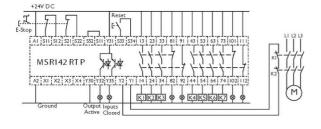
## Block Diagram



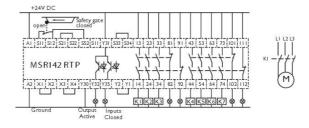
## Typical Wiring Diagrams



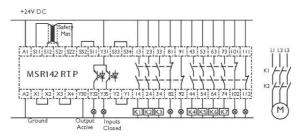




Dual Channel E-Stop, Monitored Manual Reset, Monitored Output



Single Channel Safety Gate, Auto Reset, No Output Monitoring



Safety Mat, Automatic Reset, No Output Monitoring