MSR144RTP

Description

The MSR144RTP 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 MSR144RTP checks for cross faults across the two inputs. When connected to light curtains, the light curtain must perform the cross-fault detection.

Any combination of up to five MSR230 and MSR238 output modules can be easily connected to the MSR144RTP by removing the terminator, inserting a ribbon cable from the expander and then placing the terminator into the last expansion module.

The MSR144RTP 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 MSR144RTP 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 MSR144RTP checks the output monitoring circuit through the manual application of the reset switch.

The outputs include two normally open safety rated outputs, two normally closed auxiliary outputs, and two solid-state auxiliary outputs. One solid-state output indicates the inputs are closed. The second solid-state output indicates the safety outputs are active.

The safety outputs have independent and redundant internal contacts to help ensure 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 or 1 (with MSR238)
- Light curtain, safety mat, E-stop inputs
- Two N.O. safety outputs
- Two N.C. auxiliary outputs
- Two solid-state auxiliary outputs
- Cross-fault monitoring
- Monitored manual or automatic/manual
- Removable terminals
- Expansion for up to five modules

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, AS 4024.1, ISOTR 12100
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_D: < 1.67 x 10-9 MTTFd: > 389 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 DC
Power Consumption	4 W + expanders
Inputs	
Safety Inputs	1 N.C., 2 N.C., LC or 4-wire safety mat
Input Simultaneity	Infinite
Input Resistance, Max.	45 ohms
Reset	Auto./Manual or Monitored Manual
Power On Delay/ Recovery Time	1 s/100 ms
Response Time	15 ms
Outputs	
Safety Contacts	2 N.O.
Auxiliary Contacts	2 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 = **0.35...0.1 M** 220V AC/1.7 A/375VA cosφ = **0.6...0.5 M** 30V DC/2 A/60 W = 1 M 10V DC/0.01 A/0.1 W = 2 M
Mechanical Life	2,000,000 operations
Utilization Category	
Inductive: Safety & Aux.: AC-15	5 A/250V AC
Inductive: Safety & Aux.: DC-13	3 A/24V DC
UL	B300, R300, 1 x 6 A or 2 x 5 A resistive/250V AC, 24V DC
Solid State:	20 mA/30V DC short circuit protection
Environmental and Physical Characteristics	
Enclosure Type Rating/ Terminal Protection	IP40 (NEMA 1), DIN VDE 0470-1/ IP20
Operating Temperature [C (F)]	**-5...+55 ˚ (23...131 ˚)**
Vibration	**10...55 Hz, 0.35 mm**
Shock	10 g, 16 ms, 100 shocks
Mounting	35 mm DIN Rail
Weight [g (lb)]	315 (0.71)
Conductor Size, Max.	**0.2...4 mm2 (24...12 AWG)**

★ 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

Product Selection

| Inputs	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. No.
1 N.C., 2 N.C., Light Curtain, Safety Mat	2 N.O.	2 N.C. 2 PNP solid state	Removable	Monitored Manual or Auto/Manual	24V DC	440R-C23205

Accessories

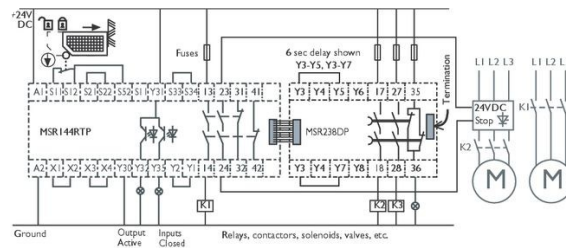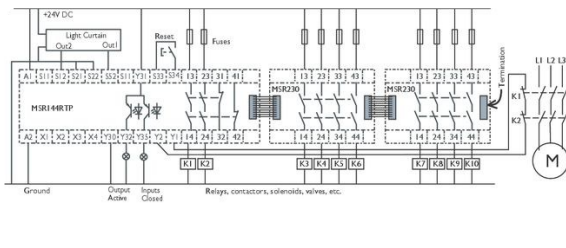| Description	Cat. No.
Bag of 4, 4-Pin Screw Terminal Blocks	440R-A23209
Bag of 4, 4-Pin Spring Clamp Terminal Blocks	440R-A23228

Approximate Dimensions

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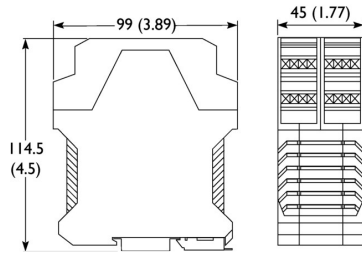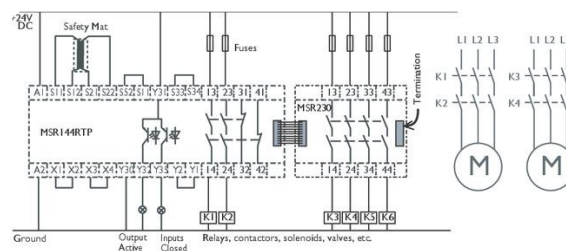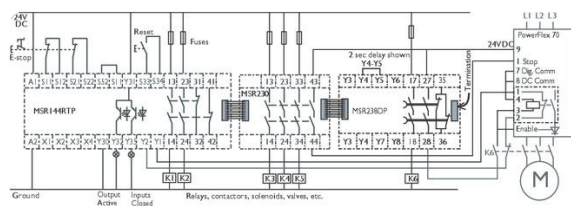

Block Diagram
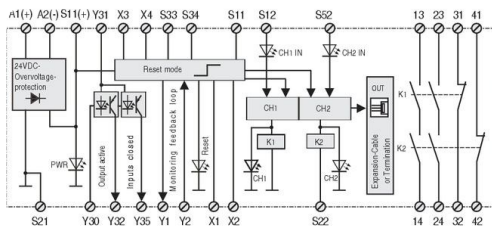
Typical Wiring Diagrams

Light Curtain, Manual Reset with Manual Reset

115V/230V AC Supply, 24V DC, Dual Channel, Automatic Reset, Monitored Output

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

Safety Mat, Automatic Reset, No Output Monitoring