



Description

The MSR210P forms one of the base units for the modular Minotaur MSR200 family of monitoring safety relays. It can be combined with other modules of the MSR200 Series to configure a safety control system with numbers of inputs and outputs matching users' specific application requirements, as well as diagnostic and networking capabilities. Up to ten input modules and two output modules can be connected to one base unit by simply removing the terminator, included with each base unit, and connecting the ribbon cables of the neighboring module. The terminators must be inserted into the final input and output modules.

The MSR210P has two inputs. Each input can be wired in one of four ways: one normally closed, two normally closed, three normally closed, safety mat connections. The MSR210P uses pulsed input monitoring to check for faults to power, ground or between inputs before a demand is placed on the safety system. Connecting a single device (must be at least dual channel) to each input meets the requirements of Category 4 per EN 954-1.

The MSR210P has the capability to perform external device monitoring (EDM). The EDM capability works in conjunction with the reset option. The user selects EDM and the reset function by jumpers across terminals Y40, Y41 and Y42.

The MSR210P has two semiconductor outputs designed to send status information to a PLC. Terminal Y33 indicates the inputs are closed (the ready LED is on). Terminal Y32 indicates the outputs are active.

The outputs include two normally open safety rated outputs and one normally closed auxiliary output.

Features

- Category 4 per EN 954-1
- Stop category 0
- Pulsed input monitoring
- Two input circuits: safety gate, E-stop or safety mat
- Up to 22 diverse input devices
- Two safety outputs, three auxiliary outputs
- Ten diagnostic LEDs
- Removable terminals

LED Indicators

| | |
|-------|----------------------------------|
| Green | Input 1 Closed |
| Red | Input 1 Open |
| Green | Input 2 Closed |
| Red | Input 2 Open |
| Green | CH1 Output Active |
| Green | CH2 Output Active |
| Green | Power |
| Green | Run (Outputs Active) |
| Red | Stop (Outputs Off) + Diagnostics |
| Amber | Ready (Inputs Closed) |

Specifications

| Safety Ratings | |
|--|--|
| Standards | EN 954-1, ISO 13849-1, IEC/EN 60204-1, IEC 60947-4-1, IEC 60947-5-1, ANSI 11.19, AS 4024.1 |
| 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 * | PFH _D : < 3.44 x 10 ⁻⁹ MTTF _d : > 203 years Note: For up-to-date information, visit http://www.ab.com/Safety/ 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, c-Tick, and TÜV |
| Power Supply | |
| Input Power Entry | 24V DC 0.8...1.1 x rated voltage |
| Power Consumption | 8 W |
| Inputs | |
| Safety Inputs | 1 N.C., 2 N.C., 3 N.C., or SM |
| Input Simultaneity | Infinite |
| Input Resistance, Max. | Inputs: 900 Ω Reset: 3200 Ω |
| Reset | Auto./Manual or Monitored Manual |
| Power On Delay/ Recovery Time | 3 seconds/ 40...145 ms, depending on expansion modules used |
| Response Time | MSR210: 29 ms MSR210 + Input Exp. Mod.: 34 ms + 6 ms/module |
| Outputs | |
| Safety Contacts | 2 N.O. |
| Auxiliary Contacts | 1 N.C., 2 PNP |
| Thermal Current/ <i>I_{th}</i> | 1 x 6 A or 2 x 4 A (nonswitching) |
| Rated Impulse withstand Voltage | 2500V |
| Switching Current @ Voltage, Min. | 10 mA @ 10V DC |
| Fuses, Output | External 6 A slow blow or 10 A fast acting |
| Solid State Output Rating | 20 mA @ 30V DC short-circuit protection |
| Electrical Life (Operations) | (With surge suppression) 250V AC/6 A/1500VA cosφ = 1...0.1 M 250V AC/2 A/500VA cosφ = 1...0.5 M 250V AC/4 A/1000VA cosφ = 0.35...0.3 M 250V AC/1.5 A/1000VA cosφ = 0.6...0.1 M 24V DC/2 A/48 W = 1 M 10V DC/0.01 A/0.1 W = 2 M |
| Mechanical Life | 2,000,000 cycles |
| Utilization Category | |
| Inductive: AC-15 | 3 A @ 250V AC 3 A @ 125V AC |
| Inductive: DC-13 | 2.5 A @ 24V DC |
| UL | 1 x B300, R300, or 2 x C300 1 x 6 A or 2 x 4 A Resistive |
| Environmental and Physical Characteristics | |
| Enclosure Type Rating/ Terminal Protection | IP40 (NEMA 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 | 45 mm housing, 35 mm DIN Rail |
| Weight [g (lb)] | 280 (0.62) |
| Conductor Size, Max. | 0.2...4 mm ² (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 | Solid State Outputs | Terminals | Reset Type | Power Supply | Cat. No. |
|---|----------------|------------------------------|---------------------|-----------|----------------------------------|---------------------------|-------------|
| Two independent inputs; 2 x 1 N.C., 2 N.C., 3 N.C., or Safety Mat | 2 N.O. | 1 N.C. and 2 PNP Solid State | 2 PNP | Removable | Auto./Manual or Monitored Manual | 24V DC from the base unit | 440R-H23176 |

Accessories

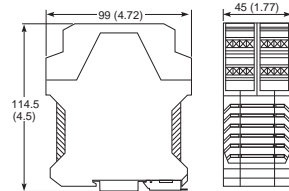
| Description | Cat. No. |
|--|-------------|
| MSR200, Two Terminators | 440R-A17138 |
| Bag of 4, 4-Pin Screw Terminal Blocks | 440R-A23209 |
| Bag of 4, 4-Pin Spring Clamp Terminal Blocks | 440R-A23228 |

Diagnostics—Red Stop LED Blinks

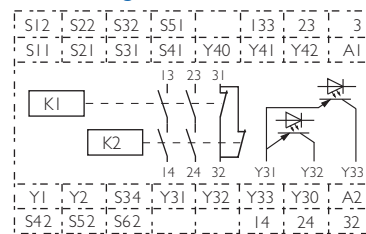
| Blink Rate | Description |
|------------|--|
| 2 | Change in Y40/Y41/Y42 circuit during operation. |
| 3 | Fault in external feedback circuit Y1-Y2. Clear fault and cycle power to reset the module. |
| Continuous | Internal fault in base or expansion module. |

Approximate Dimensions

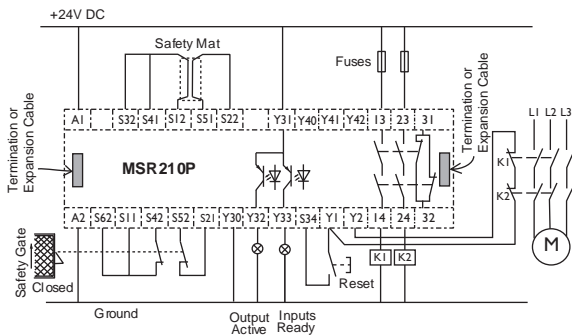
Dimensions are shown in mm (in.). Dimensions are not intended to be used for installation purposes.



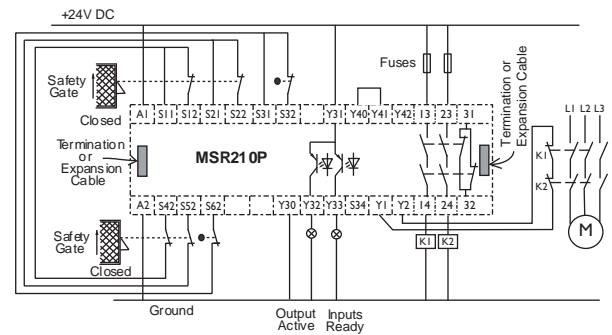
Block Diagram



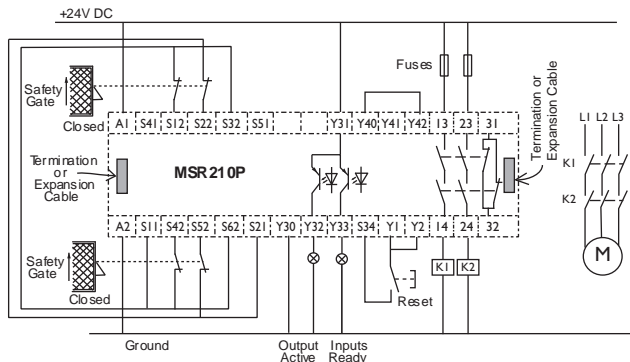
Typical Wiring Diagrams



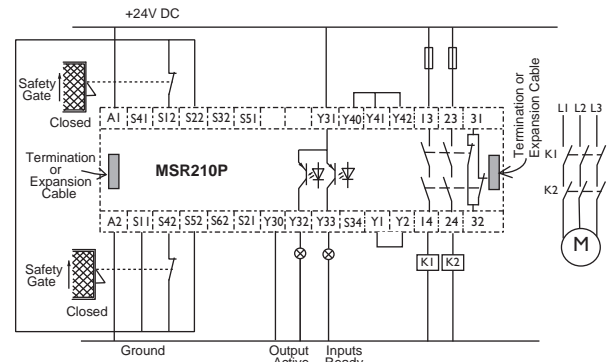
Safety Mat and Dual Channel Safety Gate, Monitored Manual Reset, Monitored Output



Two Triple Channel Inputs, Automatic Reset, Monitored Output



Two Dual Channel Safety Gates, Monitored Manual Reset, No Monitored Output



Two Single Channel Safety Gates, Automatic Reset, No Monitored Output