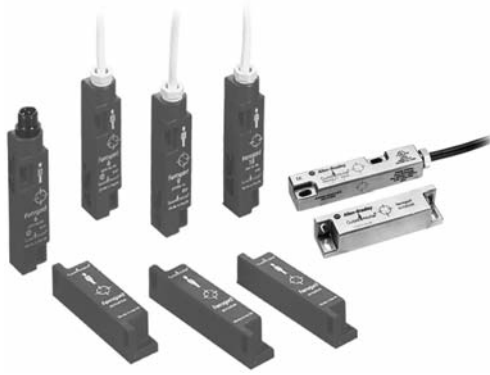


Non-Contact Switches

Ferrogard™ 6, 9,10, 13 & 14



Description

The Ferrogard range of magnetically actuated safety switches offers non-contact reliability together with tolerance to misalignment. They are designed to be installed so that when a guard door is opened, the action of the magnetic actuator being removed from the switch opens the N.C. safety contact which is intended for the isolation of control power to a machine primary control element.

The FRS 6, 9, 10, 13, and 14 sensors and actuators incorporate slim housings to accommodate narrow mounting areas. They are environmentally sealed to IP67 (NEMA 6P), which makes them ideal for wet environments. These Ferrogard switches have two active sensing faces allowing more flexible mounting options.

Unlike some magnetic switches the Ferrogards have protected safety contacts to help ensure that they do not fail to danger.

All Ferrogards have internal non-resettable overload protection on the safety contact. They should be protected by an external fuse rated as shown in the Specifications table.

Features

- Non-contact actuation
- High tolerance to misalignment
- High switching current (up to 3 A)
- Two sensing faces
- IP67 (NEMA 6P) Rating
- Slim housings
- Stainless steel models available

Specifications

| Safety Ratings | |
|--------------------------|---|
| Standards | EN954-1, ISO13849-1, IEC/EN60204-1, NFPA79, EN1088, ISO14119, ANSI B11.19, AS4024.1 |
| Safety Classification | Cat. 1 Device per EN954-1 Dual channel interlocks suitable for Cat. 3 or 4 systems |
| Functional Safety Data * | B10d: > 2 x 10 ⁶ operations at min. PFH _D : > 3 x 10 ⁻⁷ MTTFd: > 385 years Dual channel interlock may be suitable for performance levels PLe or PLd (according to ISO 13849-1:2006) and for use in SIL2 or SIL3 systems (according to IEC 62061) depending on application characteristics |
| Note: | For up-to-date information, visit http://www.ab.com/Safety/ |
| Certifications | CE Marked for all applicable directives and cULus |

| Outputs (Guard Door Closed, Actuator in Place) | | |
|--|--------|--------|
| Safety Outputs | 1 N.C. | 1 N.C. |
| Auxiliary Outputs | — | 1 N.C. |

| Operating Characteristics | |
|--------------------------------------|-----------|
| Operating Distance, Make [mm (in.)] | 12 (0.47) |
| Operating Distance, Break [mm (in.)] | 23 (0.91) |

| Environmental | |
|-------------------------------|------------------------------|
| Enclosure Type Rating | IP67 (NEMA 6P) |
| Operating Temperature [C (F)] | -10...+65° (+14...+149°) |
| Relative Humidity | 5...95% |
| Shock | IEC 68-2-27, 30 g, 11 ms |
| Vibration | IEC 68-2-6, 10...55 Hz |
| Radio Frequency | IEC 61000-4-3, IEC 61000-4-6 |

| Physical Characteristics | |
|---------------------------|---|
| Actuator/Housing Material | Molded ABS plastic |
| Weight [g (lb)] | Sensor/Actuator FRS 6—28 (0.06)/70 (0.15) FRS 9—28 (0.06)/70 (0.15) FRS 10—28 (0.06)/70 (0.15) |
| Color | Red |

* Usable for ISO 13849-1:2006 and IEC 62061. Data other than B10d is based on:
 - Usage rate of 1op/10 mins., 24 hrs/day, 360 days/year, representing 51840 operations per year
 - Mission time/Proof test interval of 38 years

3-Interlock Switches

Product Selection

| Safety Contact Switching Capability | Safety Contacts | Auxiliary Contacts | Housing Material | Type | Connection | Cat. No. |
|-------------------------------------|-----------------|--------------------|------------------------|----------------|-------------|--------------------|
| 250V AC, 2 A | 1 N.C. | — | Red Molded ABS Plastic | FRS 6 | 2 m Cable | 440N-G02023 |
| | | | | | 4 m Cable | 440N-G02028 |
| | | | | | 6 m Cable | 440N-G02032 |
| | | | | | 10 m Cable | 440N-G02013 |
| 24V DC, 1 A | | | | FRS 9 | 2 m Cable | 440N-G02044 |
| | | | | | 4 m Cable | 440N-G02075 |
| | | | | | 6 m Cable | 440N-G02082 |
| | | | | | 10 m Cable | 440N-G02089 |
| 110V AC, 3 A | FRS 10 | 4-Pin Micro QD | 440N-G02096 | | | |
| | | 2 m Cable | 440N-G02045 | | | |
| 250V AC, 2 A | 1 N.C. | Stainless Steel | FRS 13 | 4 m Cable | 440N-G02088 | |
| | | | | 2 m Cable | 440N-G02154 | |
| | | | | 4-Pin Micro QD | 440N-G02160 | |
| 24V DC, 1 A | | | FRS 14 | 2 m Cable | 440N-G02156 | |
| | | | | 4 m Cable | 440N-G02157 | |
| | | | | 4-Pin Micro QD | 440N-G02161 | |

Note: Contacts are described with the guard door closed, that is, actuator in place.

Recommended Logic Interfaces

| Description | Safety Outputs | Auxiliary Outputs | Terminals | Reset Type | Power Supply | Cat. Page No. | Cat. No. |
|--------------------------------------|------------------------------|------------------------------|-------------------|----------------------------------|---------------------------|---------------|--------------------|
| Single-Function Safety Relays | | | | | | | |
| MSR127RP | 3 N.O. | 1 N.C. | Removable (Screw) | Monitored Manual | 24V AC/DC | 5-26 | 440R-N23135 |
| MSR127TP | 3 N.O. | 1 N.C. | Removable (Screw) | Auto./Manual | 24V AC/DC | 5-26 | 440R-N23132 |
| MSR126T | 2 N.O. | None | Fixed | Auto./Manual | 24V AC/DC | 5-24 | 440R-N23117 |
| MSR30T | 2 N.O. Solid State | 1 N.O. Solid State | Removable | Auto./Manual or Monitored Manual | 24V DC | 5-16 | 440R-N23198 |
| Modular Safety Relays | | | | | | | |
| MSR210P Base 2 N.C. only | 2 N.O. | 1 N.C. and 2 PNP Solid State | Removable | Auto./Manual or Monitored Manual | 24V DC from the base unit | 5-82 | 440R-H23176 |
| MSR220P Input Module | — | — | Removable | — | 24V DC | 5-86 | 440R-H23178 |
| MSR310P Base | MSR300 Series Output Modules | 3 PNP Solid State | Removable | Auto./Manual Monitored Manual | 24V DC | 5-102 | 440R-W23219 |
| MSR320P Input Module | — | 2 PNP Solid State | Removable | — | 24V DC from the base unit | 5-106 | 440R-W23218 |

Note: For additional Safety Relays connectivity, see page 5-12.
 For additional Safety I/O and Safety PLC connectivity, see page 5-116.
 For application and wiring diagrams, see page 10-1.

Connection Systems

| Description | 4-Pin Micro (M12) |
|-------------|-------------------|
| Cordset | 889D-F4AC-* |
| Patchcord | 889D-F4ACDM-* |

* Replace symbol with 2 (2 m), 5 (5 m), or 10 (10 m) for standard cable lengths.
 * Replace symbol with 1 (1 m), 2 (2 m), 3 (3 m), 5 (5 m), or 10 (10 m) for standard cable lengths.

Note: For additional information, see page 7-1.

Accessories

| Description | Cat. No. |
|---|-------------|
| FRS 6, 9, 10 Plastic Replacement Actuator | 440N-A02025 |
| FRS 13, 14 Stainless Steel Replacement Actuator | 440N-A02165 |