



Description

The Elf is a tongue-operated (or key-operated) safety interlock switch designed to fit at the leading edge of sliding, hinged or lift-off guards. The Elf's unique miniature housing (only 75 x 25 x 29 mm (2.95 x 0.98 x 1.14 in.)) makes it the smallest interlock currently available. It is designed for smaller machines such as printers, copiers and domestic machinery which, until now, have been unable to use safety interlocks due to space restrictions. With its dual entry slots and rotatable head, the versatile Elf can offer up to eight different actuator entry options.

Operation of the switch is achieved through the insertion of a specially-profiled stainless-steel key that is permanently mounted to the guard door. The semi-flexible key allows the Elf to be used on small-radius doors (60 mm or 2.36 in.).

The Elf is available with a variety of contact configurations, conduit entry types and connectors. It is sealed to IP67 (watertight and dustproof). A blanking plug is supplied for the unused key entry.

Features

- Ideal for small, lightweight guards
- The smallest interlock switch available
- Contacts, 2 N.C. or 1 N.O. and 1 N.C.
- Eight possible actuator entry points, easy to install
- Environmental protection: IP67
- GD2 style available for demanding applications

Specifications

| Safety Ratings | |
|-----------------------|--|
| Standards | EN954-1, ISO13849-1, IEC/EN60204-1, NFPA79, EN1088, ISO14119, IEC/EN60947-5-1, ANSI B11.19, AS4024.1 |
| Safety Classification | Cat. 1 Device per EN954-1 Dual channel interlocks suitable for Cat. 3 or 4 systems |
| Certifications | CE Marked for all applicable directives, cULus, TÜV, and CCC |

| Outputs | | |
|--|--------------------|--------|
| Safety Contacts * Direct Opening Action | 1 N.C. | 2 N.C. |
| Auxiliary Contacts | 1 N.O. | None |
| Thermal Current _{I_{th}} | 5 A (10 A if A600) | |
| Rated Insulation Voltage | 2500V | |
| Switching Current @ Voltage, Min. | 5 mA @ 5V DC | |

| Utilization Category | | | | | |
|----------------------|------|-------|-------|-------|-------|
| A600/AC-15 | (Ue) | 600V | 500V | 240V | 120V |
| | (Ie) | 1.2 A | 1.4 A | 3.0 A | 6.0 A |
| DC-13 | (Ue) | 24V | | | |
| | (Ie) | 2 A | | | |

| Operating Characteristics | |
|------------------------------|---|
| Break Contact Force, Min. | 6 N (1.35 lbf) |
| Actuation Speed, Max. | 160 mm (6.29 in./s) |
| Actuation Frequency, Max. | 2 cycles/s |
| Operating Radius, Min | 150 mm (5.90 in.) [60 mm (2.36 in.) with GD2 kit, min.] |
| Operating Life @ 100 mA load | 1 x 10 ⁶ operations |

| Environmental | |
|-------------------------------|-------------------------|
| Enclosure Type Rating | IP67 |
| Operating Temperature [C (F)] | -20...+80° (-4...+176°) |

| Physical Characteristics | |
|--------------------------|------------------------------|
| Housing Material | UL Approved glass-filled PBT |
| Actuator Material | Stainless Steel |
| Weight [g (oz)] | 60 (2.11) |
| 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
- ‡ The safety contacts are described as normally closed (N.C.) i.e., with the guard closed, actuator in place (where relevant) and the machine able to be started.

Product Selection

| Contact | | | Actuator Type | Cat. No. | | | |
|---------|-----------|--------|--|--------------------|----------------------|---|---|
| | | | | M16 Conduit | | Connector§ | |
| Safety | Auxiliary | Action | | M16 | 1/2 inch NPT Adaptor | Connect to Distribution Box 4-Pin Micro (M12) | Connect to ArmorBlock Guard I/O 5-Pin Micro (M12) ‡ |
| 1 N.C. | 1 N.O. | BBM | Flat | 440K-E33036 | 440K-E33029 | 440K-E33074 | — |
| | | | 90° | 440K-E33040 | 440K-E33030 | 440K-E33025 | — |
| | | | GD2 Metal alignment guide w/semi-flex actuator | 440K-E33034 | 440K-E33031 | 440K-E33075 | — |
| | | | — | 440K-E33014 | 440K-E33053 | 440K-E33076 | — |
| 2 N.C. | — | — | Flat | 440K-E33080 | 440K-E33037 | 440K-E33077 | 440K-E2NNFPS |
| | | | 90° | 440K-E33041 | 440K-E33045 | 440K-E33024 | — |
| | | | GD2 Metal alignment guide w/semi-flex actuator | — | 440K-E33046 | 440K-E33078 | 440K-E2NNAPS |
| | | | — | 440K-E33047 | — | 440K-E33079 | — |

§ For connector ratings see page 3-9.

‡ With a 5-pin micro (M12) connector, not all contacts are connected. See *Typical Wiring Diagram* on page 3-13 for wiring details.

Recommended Logic Interfaces

| Description | Safety Outputs | Auxiliary Outputs | Terminals | Reset Type | Power Supply | Cat. Page No. | Cat. No. |
|---|------------------------------|------------------------------|-------------------|----------------------------------|---------------------------|---------------|-------------|
| Single-Function Safety Relays for 2 N.C. Contact Switch | | | | | | | |
| MSR127RP | 3 N.O. | 1 N.C. | Removable (Screw) | Monitored Manual | 24V AC/DC | 5-24 | 440R-N23135 |
| MSR127TP | 3 N.O. | 1 N.C. | Removable (Screw) | Auto./Manual | 24V AC/DC | 5-24 | 440R-N23132 |
| MSR30RT | 2 N.O. Solid State | 1 N.O. Solid State | Removable | Auto./Manual or Monitored Manual | 24V DC | 5-16 | 440R-N23198 |
| Single-Function Safety Relays for 1 N.C. & 1 N.O. Contact Switch | | | | | | | |
| MSR9T | 2 N.O. | 1 N.C. | Fixed | Auto./Manual | 24V AC/DC | 5-14 | 440R-F23027 |
| MSR33RT | 2 N.O. Solid State | 1 N.O. | Removable | Auto. or Monitored Manual | 24V DC SELV | 5-18 | 440R-F23200 |
| 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 | 5-74 | 440R-H23176 |
| MSR220P Input Module | — | — | Removable | — | 24V DC | 5-78 | 440R-H23178 |
| MSR310P Base | MSR300 Series Output Modules | 3 PNP Solid State | Removable | Auto./Manual Monitored Manual | 24V DC | 5-94 | 440R-W23219 |
| MSR320P Input Module | — | 2 PNP Solid State | Removable | — | 24V DC from the base unit | 5-98 | 440R-W23218 |

Note: For additional Safety Relays connectivity, see the Safety Relays section (page 5-8) of this catalog.

For additional Safety I/O and Safety PLC connectivity, see the Programmable Safety System section (page 5-107) of this catalog.

For application and wiring diagrams, see the Safety Applications section (page 10-1) of this catalog.

Connection Systems

| Description | Connection to Distribution Box 4-Pin Micro (M12) | | Connection to ArmorBlock Guard I/O 5-Pin Micro (M12) |
|------------------|--|---------------|--|
| | 1 N.C. & 1 N.O. | 2 N.C. | 2 N.C. |
| Cordset | 889D-F4AC-* | 889D-F4AC-* | — |
| Patchcord | 889D-F4ACDM-* | 889D-F4ACDM-* | 889R-F5ECRM-* |
| Distribution Box | 898D-P4‡KT-DM4 | 898D-4‡LT-DM4 | — |
| Shorting Plug | 898D-41KU-DM | 898D-41LU-DM | — |
| T-Port | 898D-43KY-D4 | 898D-43LY-D4 | — |







* 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.

‡ Replace symbol with 4 or 8 for number of ports.

Note: For additional information, see the Safety Connection System section (page 7-1) of this catalog.

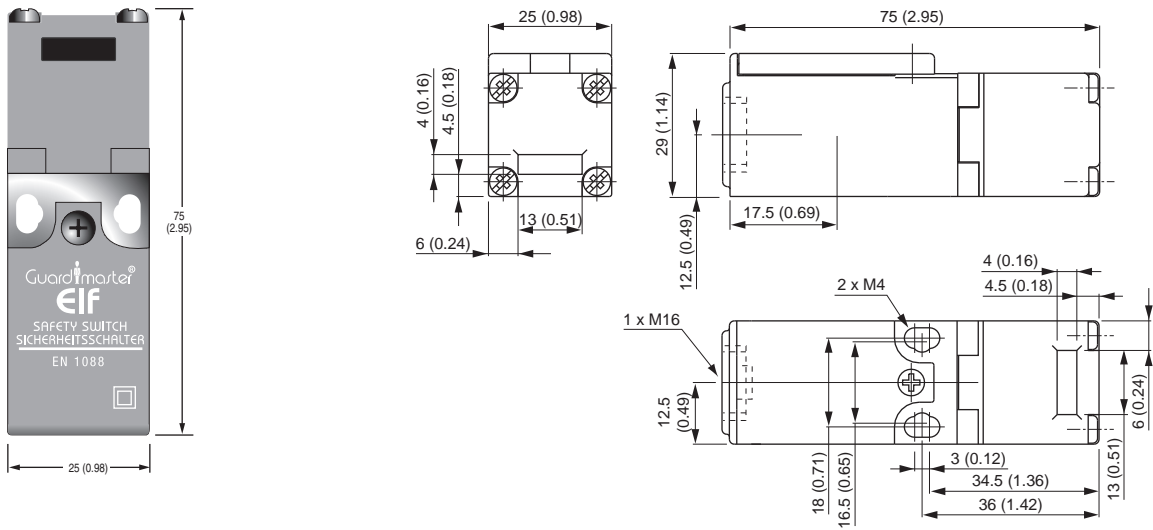
Accessories

| | Description | Dimensions | Cat. No. |
|---|--|------------|-------------|
|  | Flat actuator, not to be used with metal alignment guide | 3-52 | 440K-A21014 |
|  | 90° actuator, not to be used with metal alignment guide | 3-52 | 440K-A21006 |
|  | Metal alignment guide with semi-flexible actuator | 3-52 | 440K-A21030 |
|  | Metal Alignment Guide | 3-52 | 440K-A21069 |
|  | Replacement Cover | — | 440A-A33085 |
|  | Dust Cover | — | 440K-A17182 |

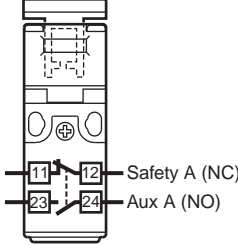
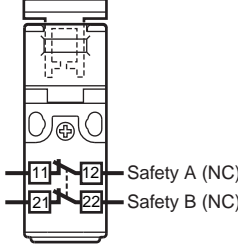
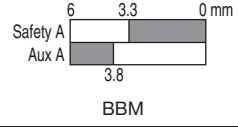
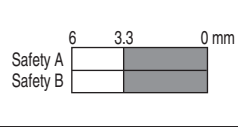

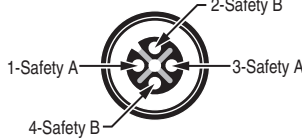
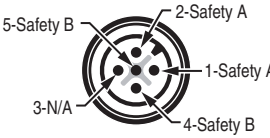
3-Interlock Switches

Approximate Dimensions

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



Typical Wiring Diagrams

| Description | | 1 N.C. & 1 N.O. | 2 N.C. |
|---|-------|--|---|
| Contact Configuration | |  |  |
| Contact Action □ Open ■ Closed | |  BBM |  |
| 4-Pin Micro (M12) | |  |  |
| 5-Pin Micro (M12) For ArmorBlock Guard I/O | | — |  |
| Cordset 889D-F4AC* | Brown | Safety A | Safety A |
| | Blue | | |
| | White | Aux A | Safety B |
| | Black | | |

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



Description

The Cadet 3 is a tongue-operated (or key-operated) safety interlock switch designed to fit at the leading edge of sliding, hinged or lift-off guards. With its dual entry slots and rotatable head, the versatile Cadet 3 can offer up to eight different actuator entry options. The unique compact housing (90.5 x 31 x 30.4 mm (3.56 x 1.22 x 1.19 in.)) has industry standard DIN 50047 fixing centers for ease of mounting.

Operation of the switch is achieved through the insertion of a specially-profiled stainless-steel key that is permanently mounted to the guard door. A semi-flexible key allows the Cadet 3 to be used on small-radii doors (60 mm or 2.36 in.).

Available with a variety of contact configurations, the Cadet 3 is sealed to IP67. A blanking plug is supplied for the unused key entry.

Features

- Compact size
- Ideal for small, lightweight guards
- Contacts, 2 N.C. and 1 N.O. or 3 N.C.
- Sealed to IP67
- Eight possible actuator entry points, easy to install
- Industry standard fixing centres to DIN 50047
- GD2 style available for demanding applications

Specifications

| Safety Ratings | | | | | |
|--|--|--------|-------|-------|-------|
| Standards | EN954-1, ISO13849-1, IEC/EN60204-1, NFPA79, EN1088, ISO14119, IEC/EN60947-5-1, ANSI B11.19, AS4024.1 | | | | |
| Safety Classification | Cat. 1 device per EN 954-1 dual channel interlocks suitable for Cat. 3 or 4 systems | | | | |
| Certifications | CE Marked for all applicable directives, cULus, TÜV, and CCC | | | | |
| Outputs | | | | | |
| Safety Contacts * Direct Opening Action | 2 N.C. | 3 N.C. | | | |
| Auxiliary Contacts | 1 N.O. | None | | | |
| Thermal Current _{I_{th}} | 10 A | | | | |
| Rated Insulation Voltage | (U _i) 500V | | | | |
| Switching Current @ Voltage, Min. | 5 mA @ 5V DC | | | | |
| Utilization Category | | | | | |
| A600/AC-15 | (U _e) | 600V | 500V | 240V | 120V |
| | (I _e) | 1.2 A | 1.4 A | 3.0 A | 6.0 A |
| DC-13 | (U _e) | 24V | | | |
| | (I _e) | 2 A | | | |
| Operating Characteristics | | | | | |
| Break Contact Force, Min. | 15 N (3.37 lbf) | | | | |
| Actuation Speed, Max. | 160 mm (6.29 in./s) | | | | |
| Actuation Frequency, Max. | 2 cycles/s | | | | |
| Operating Radius, Min | 150 mm (5.90 in.) [60 mm (2.36 in.) with GD2 kit] | | | | |
| Operating Life @ 100 mA load | 1 x 10 ⁶ operations | | | | |
| Environmental | | | | | |
| Enclosure Type Rating | IP67 | | | | |
| Operating Temperature [C (F)] | -20...+ 80° (-4...+176°) | | | | |
| Physical Characteristics | | | | | |
| Housing Material | UL Approved glass-filled PBT | | | | |
| Actuator Material | Stainless Steel | | | | |
| Weight [g (lb)] | 80 (0.176) | | | | |
| 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
- ⊛ The safety contacts are described as normally closed (N.C.) i.e., with the guard closed, actuator in place (where relevant) and the machine able to be started.

Product Selection

| Contact | | | Actuator Type | Cat. No. | | | |
|---------|-----------|--------|--|--------------------|----------------------|---|--|
| Safety | Auxiliary | Action | | M16 Conduit | | Connector§ | |
| | | | | M16 | 1/2 inch NPT Adaptor | Connect to Distribution Box 6-Pin Micro (M12) | Connect to ArmorBlock Guard I/O 5-Pin Micro (M12)* |
| 3 N.C. | — | — | Flat | 440K-C21096 | 440K-C21048 | 440K-C21090 | 440K-C2NNFPS |
| | | | 90° | 440K-C21097 | 440K-C21057 | 440K-C21091 | — |
| | | | GD2 Metal alignment guide w/semi-flex actuator | — | 440K-C21062 | 440K-C21092 | 440K-C2NNAPS |
| | | | — | 440K-C21070 | — | — | — |
| 2 N.C. | 1 N.O. | BBM | Flat | 440K-C21098 | 440K-C21050 | 440K-C21054 | — |
| | | | 90° | 440K-C21061 | 440K-C21058 | 440K-C21067 | — |
| | | | GD2 Metal alignment guide w/semi-flex actuator | — | 440K-C21074 | 440K-C21088 | — |
| | | | — | 440K-C21055 | — | — | — |
| | | MBB | Flat | 440K-C21052 | 440K-C21093 | 440K-C21060 | — |
| | | | 90° | 440K-C21065 | 440K-C21094 | 440K-C21068 | — |
| | | | GD2 Metal alignment guide w/semi-flex actuator | — | 440K-C21095 | 440K-C21089 | — |
| | | | — | 440K-C21080 | — | — | — |

§ For connector ratings see page 3-9.

§ With a 5-pin micro (M12) connector, not all contacts are connected. See *Typical Wiring Diagram* on page 3-17 for wiring details.

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 | 5-24 | 440R-N23135 |
| MSR127TP | 3 N.O. | 1 N.C. | Removable (Screw) | Auto./Manual | 24V AC/DC | 5-24 | 440R-N23132 |
| MSR126T | 2 N.O. | None | Fixed | Auto./Manual | 24V AC/DC | 5-22 | 440R-N23117 |
| MSR30RT | 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 | 5-74 | 440R-H23176 |
| MSR220P Input Module | — | — | Removable | — | 24V DC | 5-78 | 440R-H23178 |
| MSR310P Base | MSR300 Series Output Modules | 3 PNP Solid State | Removable | Auto./Manual Monitored Manual | 24V DC | 5-94 | 440R-W23219 |
| MSR320P Input Module | — | 2 PNP Solid State | Removable | — | 24V DC from the base unit | 5-98 | 440R-W23218 |

Note: For additional Safety Relays connectivity, see the Safety Relays section (page 5-8) of this catalog.

For additional Safety I/O and Safety PLC connectivity, see the Programmable Safety System section (page 5-107) of this catalog.

For application and wiring diagrams, see the Safety Applications section (page 10-1) of this catalog.

Connection Systems






| Description | 6-Pin Micro (M12) | 5-Pin Micro (M12) |
|------------------|-------------------|-------------------|
| Cordset | 889R-F6ECA-* | — |
| Patchcord | 889R-F6ECRM-* | 889R-F5ECRM-* |
| Distribution Box | 898R-P68MT-A5 | — |
| Shorting Plug | 898R-P61MU-RM | — |
| T-Port | NA | — |

* 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.

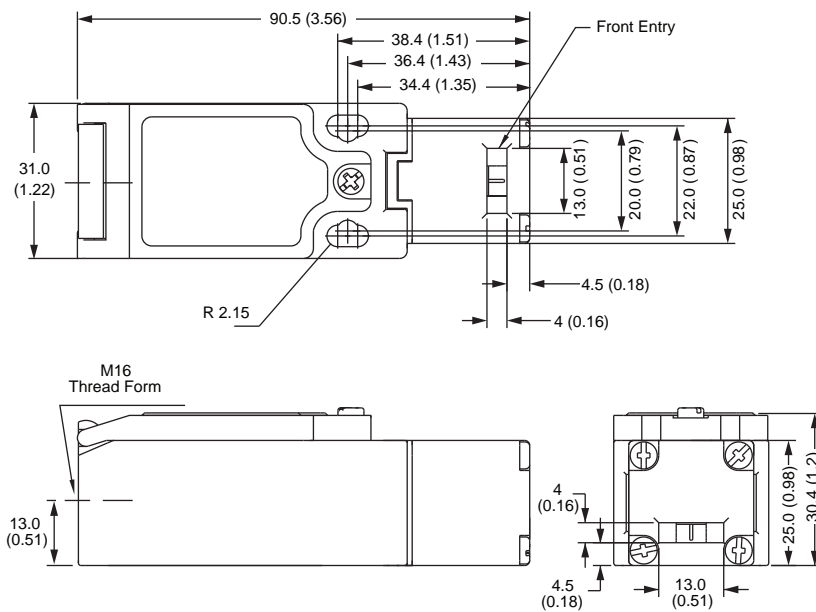
Note: For additional information, see the Safety Connection System section (page 7-1) of this catalog.

Accessories

| | Description | Dimensions | Cat. No. |
|---|--|------------|-------------|
|  | Flat actuator, not to be used with metal alignment guide | 3-52 | 440K-A21014 |
|  | 90° actuator, not to be used with metal alignment guide | | 440K-A21006 |
|  | Metal alignment guide with semi-flexible actuator | | 440K-A21030 |
|  | Replacement Cover | — | 440A-A21115 |
|  | Dust Cover | — | 440K-A17182 |

Approximate Dimensions

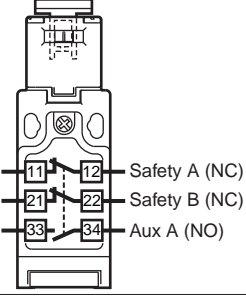
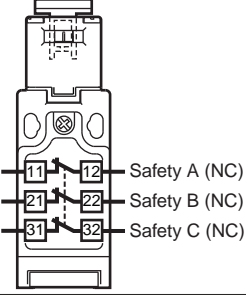
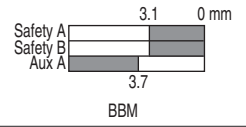
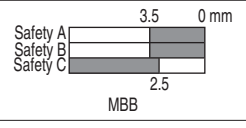
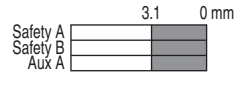
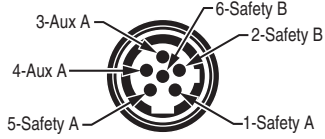
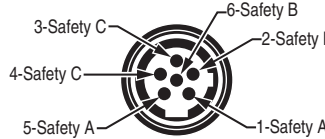
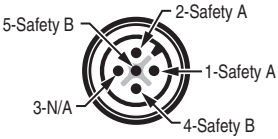
Dimensions are shown in mm (in.). Dimensions are not intended to be used for installation purposes.



Note: 2D, 3D and electrical drawings are available on www.ab.com.

3-Interlock Switches

Typical Wiring Diagrams

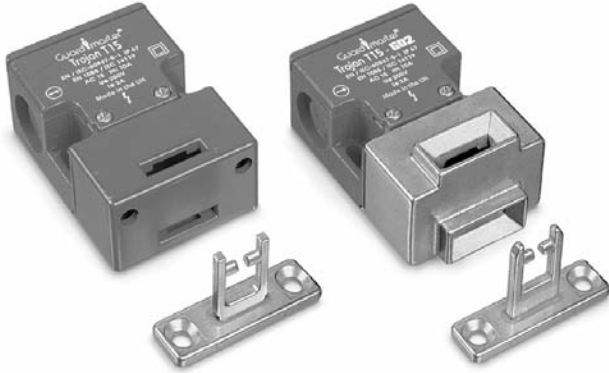
| Description | | 2 N.C. & 1 N.O. | 3 N.C. |
|-------------------------|-----------|--|--|
| Contact Configuration | |  |  |
| Contact Action | | <p>□ Open ■ Closed</p>  <p>BBM</p>  <p>MBB</p> |  |
| 6-Pin Micro (M12) | |  |  |
| 5-Pin Micro (M12) | | — |  |
| Cordset 889R-F6ECA-* | Red/White | Safety A | Safety A |
| | Red/Black | | |
| | Red | Safety B | Safety B |
| | Red/Blue | | |
| | Green | Aux A | Safety C |
| Red/Yellow | | | |

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

Safety Switches

Tongue Switches

Trojan™ T15



Description

The Trojan T15 is a compact universal tongue-operated (or key-operated) safety interlock switch designed to fit at the leading edge of sliding, hinged or lift-off guards. With its dual entry slots and rotatable head, movable only by releasing the cover screws, the Trojan T15 can offer four different options for actuator entry.

The Trojan T15 features a compact housing, only 75 x 52 x 32 mm (2.95 x 2.04 x 1.25 in.) and includes direct opening action contacts and a tamper-resistant mechanism. The Trojan T15 has 2 N.C. safety contacts or 1 N.C. safety contact and 1 N.O. auxiliary contact. The unit is sealed to IP67 and has three M20 conduit entries.

Operation of the switch is achieved by the insertion of the specially-profiled stainless-steel actuator which should be permanently fixed to the leading edge of the guard door. The standard T15 incorporates actuator retention force of 30N. An optional catch mechanism helps keep doors shut on vibrating machinery.

Features

- Compact size, 75 x 52 x 32 mm (2.95 x 2.05 x 1.26 in.) case
- 30 N actuator retention force
- Strong and versatile, can be used in most applications
- Contacts: 2 N.C. safety or 1 N.C. safety & 1 N.O. auxiliary
- GD2 style available for demanding applications

Specifications

| Safety Ratings | | | | | |
|--|--|--------|-------|-------|-------|
| Standards | EN954-1, ISO13849-1, IEC/EN60204-1, NFPA79, EN1088, ISO14119, IEC/EN60947-5-1, ANSI B11.19, AS4024.1 | | | | |
| Safety Classification | Cat. 1 device per EN 954-1 dual channel interlocks suitable for Cat. 3 or 4 systems | | | | |
| Certifications | CE Marked for all applicable directives, cULus, TÜV, and CCC | | | | |
| Outputs | | | | | |
| Safety Contacts * Direct Opening Action | 2 N.C. | 1 N.C. | | | |
| Auxiliary Contacts | None | 1 N.O. | | | |
| Thermal Current _{I_{th}} | 10 A | | | | |
| Rated Insulation Voltage | (Ui) 500V | | | | |
| Switching Current @ Voltage, Min. | 5 mA @ 5V DC | | | | |
| Utilization Category | | | | | |
| A600/AC-15 (Ue) | (Ue) | 600V | 500V | 240V | 120V |
| (Ie) | (Ie) | 1.2 A | 1.4 A | 3.0 A | 6.0 A |
| DC-13 (Ue) | (Ue) | 24V | | | |
| (Ie) | (Ie) | 2 A | | | |
| Operating Characteristics | | | | | |
| Break Contact Force, Min. | 30 N (6.70 lbf) | | | | |
| Actuation Speed, Max. | 160 mm (6.29 in.)/s | | | | |
| Actuation Frequency, Max. | 2 cycles/s | | | | |
| Operating Radius, Min | 175 mm (6.89 in.) [60 mm (2.36 in.) with flexible actuator] | | | | |
| Operating Life @ 100 mA load | 1 x 10 ⁶ operations | | | | |
| Environmental | | | | | |
| Enclosure Type Rating | IP67 | | | | |
| Operating Temperature [C (F)] | -20...+80° (-4...+176°) | | | | |
| Physical Characteristics | | | | | |
| Housing Material | UL Approved glass-filled PBT | | | | |
| Actuator Material | Stainless Steel | | | | |
| Weight [g (lb)] | 120 (0.265) | | | | |
| 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

* The safety contacts are described as normally closed (N.C.) i.e., with the guard closed, actuator in place (where relevant) and the machine able to be started.

Product Selection

| Type | Contact | | Contact Action | Actuator Type | Cat. No. | | | |
|---------------------|---------|-----------|----------------|---------------|--------------------|----------------------|---|---|
| | Safety | Auxiliary | | | M20 Conduit | | Connector§ | |
| | | | | | M20 | 1/2 inch NPT Adaptor | Connect to Distribution Box 4-Pin Micro (M12) | Connect to ArmorBlock Guard I/O 5-Pin Micro (M12) |
| Trojan T15 Standard | 2 N.C. | — | — | Standard | 440K-T11303 | 440K-T11267 | 440K-T11307 | 440K-V2NNSPS |
| | | | | Fully-Flex | 440K-T11395 | 440K-T11273 | 440K-T11384 | 440K-V2NNBPS |
| | | | | — | 440K-T11269 | — | 440K-T11385 | — |
| | 1 N.C. | 1 N.O. | BBM | Standard | 440K-T11305 | 440K-T11268 | 440K-T11386 | — |
| | | | | Fully-Flex | 440K-T11396 | 440K-T11276 | 440K-T11387 | — |
| | | | | — | 440K-T11270 | — | 440K-T11388 | — |
| Trojan T15 GD2 | 2 N.C. | — | — | GD2 Standard | 440K-T11463 | 440K-T11288 | 440K-T11389 | 440K-V2NNGPS-NG |
| | | | | Fully-Flex | 440K-T11397 | 440K-T11287 | 440K-T11390 | — |
| | | | | — | 440K-T11280 | — | 440K-T11391 | — |
| | 1 N.C. | 1 N.O. | BBM | GD2 Standard | 440K-T11398 | 440K-T11284 | 440K-T11392 | — |
| | | | | Fully-Flex | 440K-T11399 | 440K-T11283 | 440K-T11393 | — |
| | | | | — | 440K-T11279 | — | 440K-T11394 | — |

§ For connector ratings see page 3-9.

Recommended Logic Interfaces

| Description | Safety Outputs | Auxiliary Outputs | Terminals | Reset Type | Power Supply | Cat. Page No. | Cat. No. |
|---|------------------------------|------------------------------|-------------------|----------------------------------|---------------------------|---------------|-------------|
| Single-Function Safety Relays for 2 N.C. Contact Switch | | | | | | | |
| MSR127RP | 3 N.O. | 1 N.C. | Removable (Screw) | Monitored Manual | 24V AC/DC | 5-24 | 440R-N23135 |
| MSR127TP | 3 N.O. | 1 N.C. | Removable (Screw) | Auto./Manual | 24V AC/DC | 5-24 | 440R-N23132 |
| MSR30RT | 2 N.O. Solid State | 1 N.O. Solid State | Removable | Auto./Manual or Monitored Manual | 24V DC | 5-16 | 440R-N23198 |
| Single-Function Safety Relays for 1 N.C. & 1 N.O. Contact Switch | | | | | | | |
| MSR9T | 2 N.O. | 1 N.C. | Fixed | Auto./Manual | 24V AC/DC | 5-14 | 440R-F23027 |
| MSR33RT | 2 N.O. Solid State | 1 N.O. | Removable | Auto. or Monitored Manual | 24V DC SELV | 5-18 | 440R-F23200 |
| 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 | 5-74 | 440R-H23176 |
| MSR220P Input Module | — | — | Removable | — | 24V DC | 5-78 | 440R-H23178 |
| MSR310P Base | MSR300 Series Output Modules | 3 PNP Solid State | Removable | Auto./Manual Monitored Manual | 24V DC | 5-94 | 440R-W23219 |
| MSR320P Input Module | — | 2 PNP Solid State | Removable | — | 24V DC from the base unit | 5-98 | 440R-W23218 |

Note: For additional Safety Relays connectivity, see the Safety Relays section (page 5-8) of this catalog.
For additional Safety I/O and Safety PLC connectivity, see the Programmable Safety System section (page 5-107) of this catalog.
For application and wiring diagrams, see the Safety Applications section (page 10-1) of this catalog.

Connection Systems

| Description | Connection to Distribution Box 4-Pin Micro (M12) | | Connection to ArmorBlock Guard I/O 5-Pin Micro (M12) |
|------------------|--|-----------------|--|
| | 2 N.C. | 1 N.C. & 1 N.O. | 2 N.C. |
| Cordset | 889D-F4AC-* | 889D-F4AC-* | — |
| Patchcord | 889D-F4ACDM-* | 889D-F4ACDM-* | 889D-F5ACDM-* |
| Distribution Box | 898D-4†LT-DM4 | 898D-P4‡KT-DM4 | — |
| Shorting Plug | 898D-41LU-DM | 898D-41KU-DM | — |
| T-Port | 898D-43LY-D4 | 898D-43KY-D4 | — |

* 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.
† Replace symbol with 4 or 8 for number of ports.

Note: For additional information, see the Safety Connection System section (page 7-1) of this catalog.

Safety Switches
Tongue Switches
Trojan™ T15

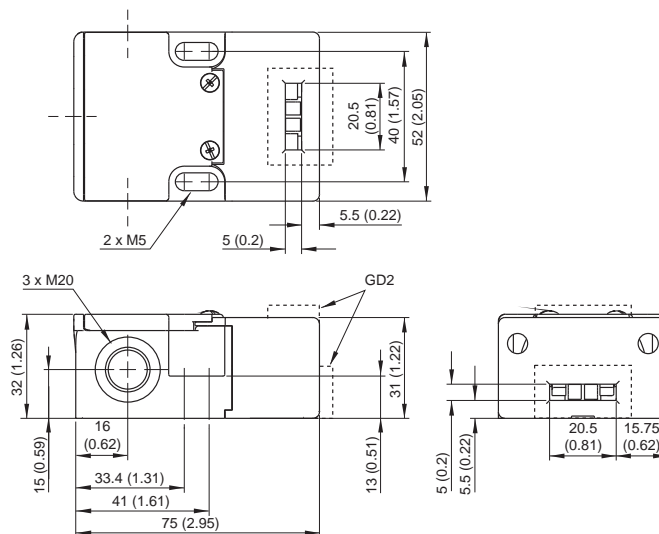
Accessories

| | Description | To Be Used With: | Dimensions | Cat. No. |
|---|--|--|------------|-------------|
|  | Standard actuator | Trojan T15 Standard Models Only | 3-51 | 440K-A11238 |
|  | GD2 standard actuator | Trojan GD2 Models Only | 3-50 | 440G-A27011 |
|  | GD2 flat actuator | Trojan GD2 Models Only | 3-51 | 440K-A11112 |
|  | Alignment guide with semi-flexible actuator | Discard Alignment Guide for GD2 Models | | 440K-A11144 |
|  | Alignment guide with fully-flexible actuator | Discard Alignment Guide for GD2 Models | | 440K-A27010 |
|  | Sliding bolt actuator | Trojan GD2 Models Only | 3-55 | 440G-A27163 |
|  | Catch and Retainer Kit | Trojan T15 Standard Models Only | 3-50 | 440K-A11094 |
|  | Replacement Cover | All Models | — | 440A-A11499 |
|  | Dust Cover | All Models | — | 440K-A17180 |

3-Interlock Switches

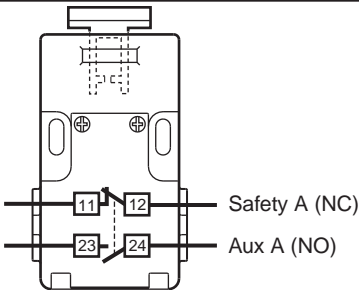
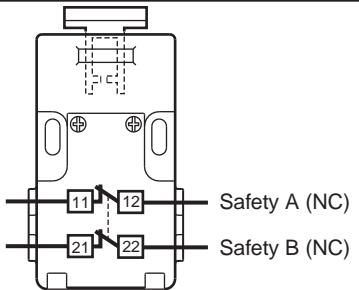
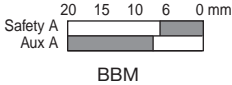
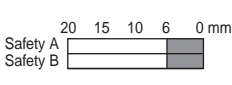

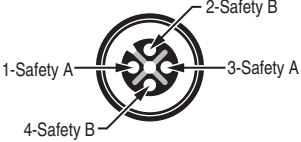
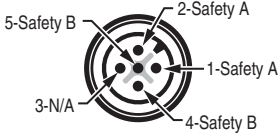
Approximate Dimensions

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



Note: 2D, 3D and electrical drawings are available on www.ab.com.

Typical Wiring Diagrams

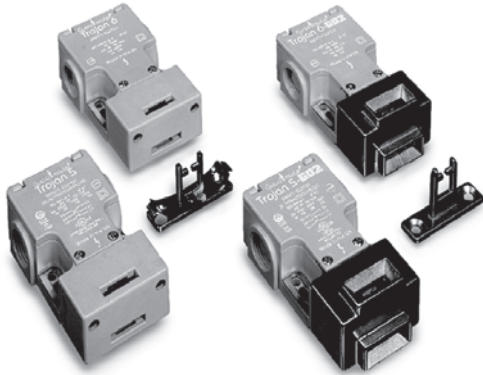
| Description | | 1 N.C. & 1 N.O. | 2 N.C. |
|---|-------|---|---|
| Contact Configuration | |  |  |
| Contact Action □ Open ■ Closed | |  |  |
| 4-Pin Micro (M12) | |  |  |
| 5-Pin Micro (M12) For ArmorBlock Guard I/O | | — |  |
| Cordset 889D-F4AC-* | Brown | Safety A | Safety A |
| | Blue | | |
| | White | Aux A | Safety B |
| | Black | | |

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

Safety Switches

Tongue Switches

Trojan™ 5 & 6



Description

The Trojan family is a universal tongue-operated (or key-operated) safety-interlock switch designed to fit at the leading edge of sliding, hinged or lift-off guards. The dual key entry slots and rotatable head, movable only by releasing the cover screws, allow four actuator entry options. The Trojan contains all of the safety related functions—i.e., forced guided contacts, tamper resistant mechanism—allowing the machine to be safeguarded in compliance with the machine directive.

Operation of the switch is achieved through the insertion of a specially-profiled stainless-steel key that is permanently mounted to the leading edge of the guard door. The standard (not GD2) Trojan actuator includes a self-ejecting mechanism that prevents operation of the switch if the actuator is not mounted to the guard door (e.g., if the operator uses a spare key).

Features

- Strong and versatile, can be used in most applications
- Self-ejecting tamper resistant actuator, only operates when mounted to the guard (not with GD2 models)
- Four possible actuator entry points, easy to install
- GD2 style available for demanding applications

Specifications

| Safety Ratings | |
|--------------------------|--|
| Standards | EN 954-1, ISO 13849-1, IEC/EN 60204-1, NFPA 79, EN 1088, ISO 14119, IEC/EN 60947-5-1, ANSI B11.19, AS 4024.1 |
| Safety Classification | Cat. 1 device per EN 954-1 dual channel interlocks suitable for Cat. 3 or 4 systems |
| Functional Safety Data * | B10d: > 2 x 10 ⁶ operations at min. load PFH _D : > 3 x 10 ⁻⁷ MTTFd: > 385 years Dual channel interlock may be suitable for performance levels Pl _e or Pl _d (according to ISO 13849-1:2006) and for use in SIL2 or SIL3 systems (according to IEC 62061) depending on application characteristics |
| Certifications | CE Marked for all applicable directives, cULus, TÜV, and CCC |

| Outputs | | | |
|--|------------------------|--------|--------|
| Safety Contacts * Direct Opening Action | 3 N.C. | 2 N.C. | 2 N.C. |
| Auxiliary Contacts | 1 N.O. | 2 N.O. | 1 N.O. |
| Thermal Current/ <i>I_{th}</i> | 10 A | | |
| Rated Insulation Voltage | (U _i) 500V | | |
| Switching Current @ Voltage, Min. | 5 mA @ 5V DC | | |

| Utilization Category | | | | | |
|-------------------------------|-------------------|-------|-------|------|------|
| Trojan 5 A300/AC-15 | (U _e) | 240V | 120V | | |
| | (I _e) | 3 A | 6 A | | |
| DC-13 | (U _e) | 24V | 24V | | |
| | (I _e) | 2 A | | | |
| Trojan 6 A600/AC-15 | (U _e) | 600V | 500V | 240V | 120V |
| | (I _e) | 1.2 A | 1.4 A | 3 A | 6 A |
| DC-13 | (U _e) | 24V | | | |
| | (I _e) | 2 A | | | |

| Operating Characteristics | |
|------------------------------|--|
| Break Contact Force, Min. | Trojan 5: 12 N (2.7 lbf) & 30 N (6.75 lbf) Trojan 6: 20 N (4.5 lbf) |
| Actuation Speed, Max. | 160 mm (6.29 in.)/s |
| Actuation Frequency, Max. | 2 cycles/s |
| Operating Radius, Min | 175 mm (6.89 in.) [60 mm (2.36 in.) with flexible actuator] |
| Operating Life @ 100 mA load | 1 x 10 ⁶ operations |

| Environmental | |
|-------------------------------|-------------------------|
| Enclosure Type Rating | IP67 |
| Operating Temperature [C (F)] | -20...+80° (-4...+176°) |

| Physical Characteristics | |
|--------------------------|------------------------------|
| Housing Material | UL Approved glass-filled PBT |
| Actuator Material | Stainless Steel |
| Weight [g (lb)] | 160 (0.35) |
| 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
- * The safety contacts are described as normally closed (N.C.) i.e., with the guard closed, actuator in place (where relevant) and the machine able to be started.

Product Selection

| Type | Contact | | | Actuator Type | Cat. No. | | | | | | |
|-------------------|---------|-----------|-------------------|------------------|-------------|----------------------|---|--|-------------|-------------|---|
| | Safety | Auxiliary | Action | | M20 Conduit | | Connector§ | | | | |
| | | | | | M20 | 1/2 inch NPT Adaptor | Connect to Distribution Box 6-Pin Micro (M12) | Connect to ArmorBlock Guard I/O 5-Pin Micro (M12)* | | | |
| Trojan 5 Standard | 2 N.C. | 1 N.O. | BBM | Standard | 440K-T11090 | 440K-T11202 | 440K-T11205 | — | | | |
| | | | | Guide/Semi-Flex | 440K-T11110 | 440K-T11203 | 440K-T11206 | — | | | |
| | | | | Guide/Fully-Flex | 440K-T11467 | 440K-T11204 | 440K-T11207 | 440K-T2NNBPS | | | |
| | | | | — | 440K-T11089 | — | 440K-T11129 | — | | | |
| | | | BBM Gold Contacts | Standard | 440K-T11085 | — | — | — | | | |
| | | | | — | — | — | — | — | | | |
| | | | MBB | Standard | 440K-T11118 | 440K-T11208 | 440K-T11224 | — | | | |
| | | | | Guide/Semi-Flex | 440K-T11123 | 440K-T11209 | 440K-T11363 | — | | | |
| | | | | Guide/Fully-Flex | 440K-T11468 | 440K-T11210 | 440K-T11364 | — | | | |
| | | | | — | 440K-T11146 | 440K-T11469 | 440K-T11365 | — | | | |
| Trojan 5 GD2 | 2 N.C. | 1 N.O. | BBM | GD2 Standard | 440K-T11336 | 440K-T11211 | 440K-T11366 | 440K-T2NNGPS-NG | | | |
| | | | | Guide/Semi-Flex | 440K-T11337 | 440K-T11212 | 440K-T11367 | — | | | |
| | | | | Guide/Fully-Flex | 440K-T11338 | 440K-T11213 | 440K-T11368 | — | | | |
| | | | | — | 440K-T11147 | — | 440K-T11226 | — | | | |
| | | | MBB | GD2 Standard | 440K-T11339 | 440K-T11470 | 440K-T11369 | — | | | |
| | | | | Guide/Semi-Flex | 440K-T11340 | 440K-T11471 | 440K-T11370 | — | | | |
| | | | | Guide/Fully-Flex | 440K-T11341 | 440K-T11472 | 440K-T11371 | — | | | |
| | | | | — | 440K-T11167 | — | 440K-T11372 | — | | | |
| | | | Trojan 5 30 N | 2 N.C. | 1 N.O. | BBM | Standard | 440K-T11333 | 440K-T91024 | 440K-T11492 | — |

§ For connector ratings see page 3-9.

* With a 5-pin micro (M12) connector, not all contacts are connected. See *Typical Wiring Diagram* on page 3-27 for wiring details.

| Type | Contact | | | Actuator Type | Cat. No. | | |
|--------------|---------|-----------|--------|---------------|-------------|----------------------|--------------------|
| | Safety | Auxiliary | Action | | M20 Conduit | | Connector§ |
| | | | | | M20 | 1/2 inch NPT Adaptor | 8-Pin Micro (M12)* |
| Trojan 6 | 3 N.C. | 1 N.O. | BBM | Standard | 440K-T11171 | 440K-T11435 | — |
| | | | | — | 440K-T11449 | 440K-T11408 | — |
| | 2 N.C. | 2 N.O. | BBM | Standard | 440K-T11174 | 440K-T11438 | — |
| | | | | — | 440K-T11452 | 440K-T11416 | 440K-W21BNPH |
| Trojan 6 GD2 | 3 N.C. | 1 N.O. | BBM | GD2 Standard | 440K-T11418 | 440K-T11466 | — |
| | | | | — | 440K-T11188 | 440K-T11444 | — |
| | | | MBB | — | 440K-T11456 | 440K-T11457 | — |
| | 2 N.C. | 2 N.O. | BBM | GD2 Standard | 440K-T11445 | 440K-T11425 | — |
| | | | | — | 440K-T11459 | 440K-T11433 | 440K-W21BNPH-NG |
| | | | | MBB | — | 440K-T11460 | 440K-T11461 |

§ For connector ratings see page 3-9.

* With an 8-pin micro (M12) connector, not all contacts are connected. See *Typical Wiring Diagram* on page 3-27 for wiring details.

Safety Switches

Tongue Switches

Trojan™ 5 & 6

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 | 5-24 | 440R-N23135 |
| MSR127TP | 3 N.O. | 1 N.C. | Removable (Screw) | Auto./Manual | 24V AC/DC | 5-24 | 440R-N23132 |
| MSR126T | 2 N.O. | None | Fixed | Auto./Manual | 24V AC/DC | 5-22 | 440R-N23117 |
| MSR30RT | 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 | 5-74 | 440R-H23176 |
| MSR220P Input Module | — | — | Removable | — | 24V DC | 5-78 | 440R-H23178 |
| MSR310P Base | MSR300 Series Output Modules | 3 PNP Solid State | Removable | Auto./Manual Monitored Manual | 24V DC | 5-94 | 440R-W23219 |
| MSR320P Input Module | — | 2 PNP Solid State | Removable | — | 24V DC from the base unit | 5-98 | 440R-W23218 |

Note: For additional Safety Relays connectivity, see the Safety Relays section (page 5-8) of this catalog.
 For additional Safety I/O and Safety PLC connectivity, see the Programmable Safety System section (page 5-107) of this catalog.
 For application and wiring diagrams, see the Safety Applications section (page 10-1) of this catalog.









Connection Systems

| Description | Trojan 5 | | Trojan 6 |
|------------------|-------------------|-------------------|-------------------|
| | 5-Pin Micro (M12) | 6-Pin Micro (M12) | 8-Pin Micro (M12) |
| Cordset | — | 889R-F6ECA-* | 889D-F8AB-* |
| Patchcord | 889R-F5ECRM-* | 889R-F6ECRM-⚡ | 889D-F8ABDM-⚡ |
| Distribution Box | — | 898R-F68MT-A5 | — |
| Shorting Plug | — | 898R-P61MU-RM | — |
| T-Port | — | — | — |

* 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.
 ‡ Replace symbol with 4 or 8 for number of ports.
Note: For additional information, see the Safety Connection System section (page 7-1) of this catalog.

3-Interlock Switches

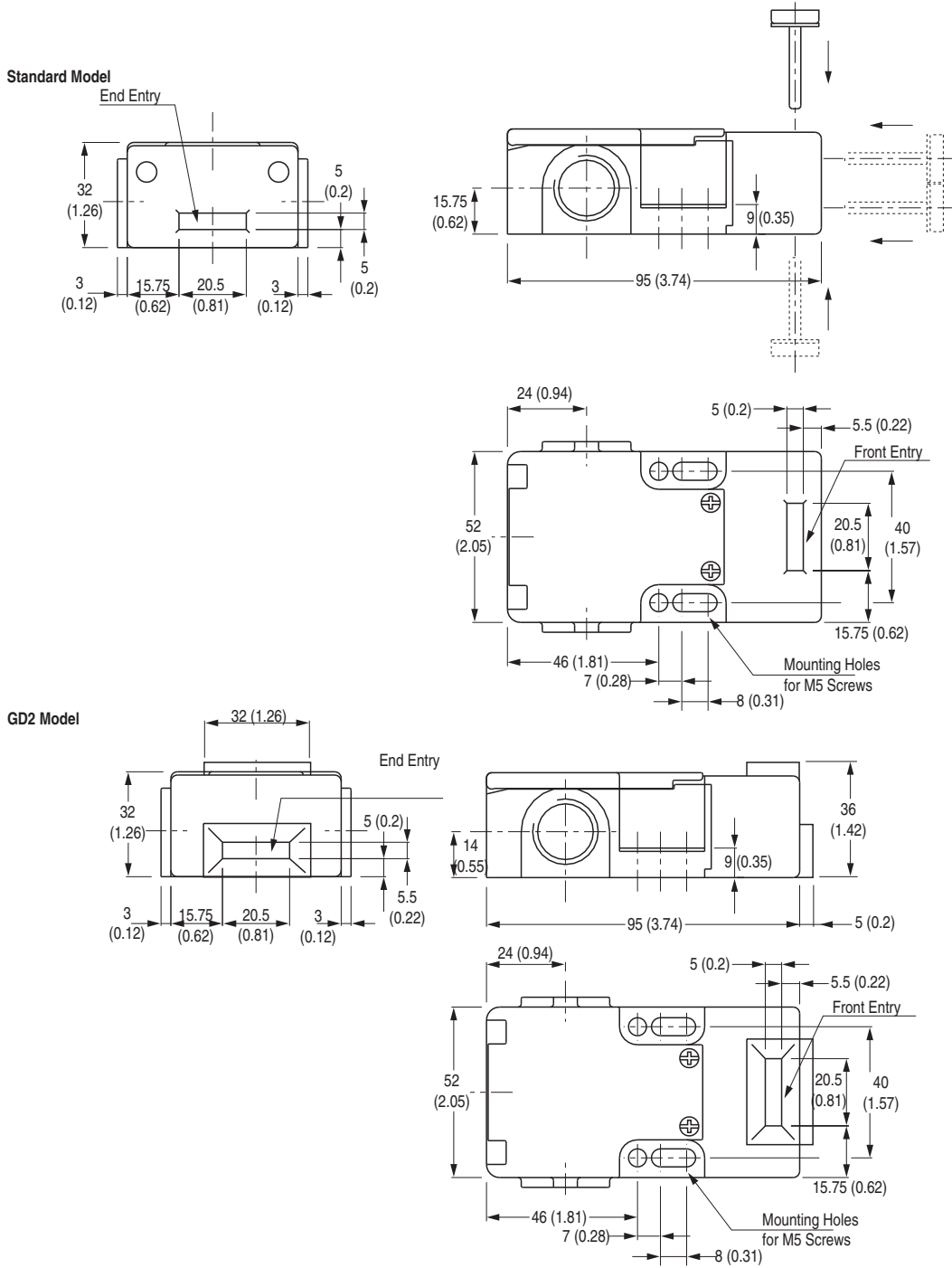
Accessories

| | Description | To Be Used With: | Dimensions | Cat. No. |
|---|--|--|------------|-------------|
|  | Standard actuator | Trojan T5 and T6 Standard Models Only | 3-51 | 440K-A11095 |
|  | GD2 standard actuator | GD2 Models Only | 3-50 | 440G-A27011 |
|  | GD2 flat actuator | GD2 Models Only | 3-51 | 440K-A11112 |
|  | Alignment guide with semi-flexible actuator | Discard Alignment Guide for GD2 Models | 3-51 | 440K-A11144 |
|  | Alignment guide with fully-flexible actuator | Discard Alignment Guide for GD2 Models | 3-52 | 440K-A27010 |
|  | Sliding bolt actuator | GD2 Models Only | 3-55 | 440G-A27163 |
|  | Catch and Retainer Kit | Trojan T5 and T6 Standard Models Only | 3-50 | 440K-A11094 |
|  | Replacement Cover | Trojan T5 Standard Models Only | — | 440A-A11495 |
| | | Trojan T5 GD2 | | 440A-A11496 |
| | | Trojan T6 Standard Models Only | | 440A-A11497 |
| | | Trojan T6 GD2 | | 440A-A11498 |
|  | Dust Cover | All Models | — | 440K-A17180 |

Safety Switches
Tongue Switches
Trojan™ 5 & 6

Approximate Dimensions

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



Note: 2D, 3D and electrical drawings are available on www.ab.com.

Typical Wiring Diagrams

| Description | Trojan 5 | | Trojan 6 | |
|--|-----------------|----------|-----------------|---|
| | 2 N.C. & 1 N.O. | | 2 N.C. & 2 N.O. | |
| Contact Configuration | | | | |
| Contact Action | | | | |
| 6-Pin Micro (M12) | | | — | |
| 5-Pin Micro (M12) for ArmorBlock Guard I/O | | | — | |
| 8-Pin Micro (M12) | — | | | |
| 6-Pin Cordset 889R-F6ECA-* | Red/White | Safety A | — | — |
| | Red/Black | | | |
| | Red | Safety B | | |
| | Red/Blue | | | |
| | Green | | | |
| Red/Yellow | Aux | | | |
| 8-Pin Cordset 889D-F8AB-* | Grey | — | Safety A | — |
| | Red | — | Safety B | — |
| | Yellow | — | Aux A | — |
| | Pink | — | NA | — |

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



Description

The MT-GD2 family is a robust, tongue-operated (or key-operated) safety-interlock switch designed to fit at the leading edge of sliding, hinged or lift-off guards. With its dual entry slots and rotatable head, the MT-GD2 can offer eight different options for actuator entry.

The MT-GD2 features a compact housing of only 117 x 40 x 43 mm (4.60 x 1.57 x 1.69 in.) with DIN 50041 standard fixing centres and includes forced guided contacts and a tamper-resistant mechanism.

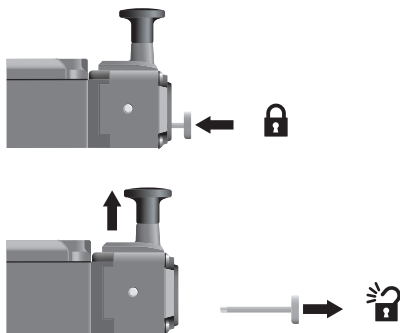
The MT-GD2 is available with a variety of contact configurations enabling it to be used as part of a system for higher-risk applications. Operation of the switch is achieved by the insertion of the specially-profiled stainless-steel actuator which should be permanently fixed to the leading edge of the guard door. An optional flexible actuator allows the MT-GD2 to operate on smaller-radius doors (≥ 60 mm) and a flat actuator gives additional mounting options, for example, on a chain.

A style incorporating a latch release mechanism allows manual retention of the actuator in the switch until the release mechanism is manually activated.

Features

- Strong and versatile, can be used in most applications
- Eight possible actuator entry points, easy to install
- Variety of contact configurations
- Snap acting MT-GD2 gives a min. break contact force of 40 N
- Optional latch release styles
- Industry standard fixing centers to DIN/EN50041

MT-GD2 Latch Release Style



Specifications

| Safety Ratings | |
|--------------------------|--|
| Standards | EN954-1, ISO13849-1, IEC/EN60204-1, NFPA79, EN1088, ISO14119, IEC/EN60947-5-1, ANSI B11.19, AS4024.1 |
| Safety Classification | Cat. 1 device per EN 954-1 dual channel interlocks suitable for Cat. 3 or 4 systems |
| Functional Safety Data * | B10d: $> 2 \times 10^6$ operations at min. load PFH _D : $> 3 \times 10^{-7}$ MTTFD: > 385 years Dual channel interlock may be suitable for performance levels Pl _e or Pl _d (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, cULus, TÜV, and CCC |

| Outputs | |
|---|---|
| Safety Contacts * | Standard: 3 N.C. or 2 N.C. direct opening action Snap acting: 2 N.C. direct opening forced disconnection |
| Auxiliary Contacts | Standard: 1 N.O. or 2 N.O. Snap Acting: 2 N.O. |
| Thermal Current _{I_{th}} | 10 A |
| Rated Insulation Voltage | (U _i) 500V |
| Switching Current @ Voltage, Min. | 5 mA @ 5V DC |

| Utilization Category | | | | | |
|------------------------|-------------------|-------|-------|------|------|
| A600/AC-15 | (U _e) | 600V | 500V | 240V | 120V |
| | (I _e) | 1.2 A | 1.4 A | 3 A | 6 A |
| Standard—DC-13 | (U _e) | 24V | | | |
| | (I _e) | 2 A | | | |
| Snap-Acting—A300/AC-15 | (U _e) | 240V | 120V | | |
| | (I _e) | 3 A | 6 A | | |
| Snap-Acting—DC-13 | (U _e) | 24V | | | |
| | (I _e) | 2 A | | | |

| Operating Characteristics | |
|------------------------------|--|
| Break Contact Force, Min. | BBM & MBB: 12 N (2.7 lbf) BBM & Extended Flat Actuator: 32 N (7.2 lbf) Snap acting: 40 N (9.0 lbf) |
| Actuation Speed, Max. | 160 mm (6.29 in.)/s |
| Actuation Frequency, Max. | 2 cycles/s |
| Operating Life @ 100 mA load | 1×10^6 operations |

| Environmental | |
|-------------------------------|-------------------------|
| Enclosure Type Rating | IP67 |
| Operating Temperature [C (F)] | -20...+80° (-4...+176°) |

| Physical Characteristics | |
|--------------------------|-----------------|
| Housing Material | Painted zinc |
| Actuator Material | Stainless Steel |
| Weight [g (lb)] | 520 (1.15) |
| Color | Yellow or 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
- * The safety contacts are described as normally closed (N.C.) i.e., with the guard closed, actuator in place (where relevant) and the machine able to be started.

Product Selection
Red Body Switches

| Type | Contact | | | Actuator Type | Cat. No. | | | | | |
|--------|---------|-----------|-------------|----------------|---------------------|---------------------|---------------------|--------------------|--|--------------|
| | Safety | Auxiliary | Action | | Conduit | | Connector§ | | | |
| | | | | | M20 | 1/2 in NPT | 12-Pin M23 | 8-Pin Micro (M12)* | Connect to ArmorBlock Guard I/O 5-Pin Micro (M12)* | |
| MT-GD2 | 3 N.C. | 1 N.O. | BBM | — | 440K-MT55002 | 440K-MT55085 | 440K-MT55094 | — | — | |
| | | | | GD2 Standard | 440K-MT55074 | 440K-MT55022 | 440K-MT55095 | — | — | |
| | | | | Fully Flexible | 440K-MT55075 | 440K-MT55029 | 440K-MT55096 | — | — | |
| | | | MBB | — | 440K-MT55004 | 440K-MT55088 | 440K-MT55100 | — | — | |
| | | | | — | 440K-MT55005 | 440K-MT55086 | 440K-MT55097 | 440K-M21BNDH | — | |
| | | | | GD2 Standard | 440K-MT55076 | 440K-MT55026 | 440K-MT55098 | — | — | |
| | 2 N.C. | 2 N.O. | BBM | Fully Flexible | 440K-MT55077 | 440K-MT55087 | 440K-MT55099 | — | — | |
| | | | | MBB | — | 440K-MT55006 | 440K-MT55089 | 440K-MT55101 | — | — |
| | | | | | — | — | 440K-M22ANDT | 440K-M22ANDL | 440K-M21ANDH | 440K-M2NNNDS |
| | | | Snap Acting | | Extended Flat | 440K-M22AEDM | 440K-M22AEDT | — | — | — |
| | | | | GD2 Standard | 440K-M22ASDM | 440K-M22ASDT | — | — | — | |
| | | | | Fully Flexible | 440K-M22ABDM | 440K-M22ABDT | — | — | — | |

§ For connector ratings see page 3-9.

* With a 5-pin micro (M12) connector, not all contacts are connected. See *Typical Wiring Diagram* on page 3-32 for wiring details.

⊗ With an 8-pin micro (M12) connector, not all contacts are connected. See *Typical Wiring Diagram* on page 3-32 for wiring details.

Yellow Body Switches

| Type | Contact | | | Actuator Type | Cat. No. | | |
|--------|---------|-----------|-------------|---------------|---------------------|--------------|--------------------|
| | Safety | Auxiliary | Action | | Conduit | Connector§ | |
| | | | | | 1/2 in NPT | 12-Pin M23 | 5-Pin Micro (M12)* |
| MT-GD2 | 2 N.C. | 2 N.O. | Snap Acting | — | 440K-M22ANYT | — | — |
| | | | | Extended Flat | 440K-M22AEYT | 440K-M22AEYL | 440K-M2NAEYS |
| — | 2 N.C. | 2 N.O. | MBB | — | 440K-M22MNYT-N5 | — | 440K-M2NNNYS-N5 |

§ For connector ratings see page 3-9.

* With a 5-pin micro (M12) connector, not all contacts are connected. See *Typical Wiring Diagram* on page 3-32 for wiring details.

⊗ With an 8-pin micro (M12) connector, not all contacts are connected. See *Typical Wiring Diagram* on page 3-32 for wiring details.

3-Interlock
Switches

Safety Switches

Tongue Switches

MT-GD2

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 | 5-24 | 440R-N23135 |
| MSR127TP | 3 N.O. | 1 N.C. | Removable (Screw) | Auto./Manual | 24V AC/DC | 5-24 | 440R-N23132 |
| MSR126T | 2 N.O. | None | Fixed | Auto./Manual | 24V AC/DC | 5-22 | 440R-N23117 |
| MSR30RT | 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 | 5-74 | 440R-H23176 |
| MSR220P Input Module | — | — | Removable | — | 24V DC | 5-78 | 440R-H23178 |
| MSR310P Base | MSR300 Series Output Modules | 3 PNP Solid State | Removable | Auto./Manual Monitored Manual | 24V DC | 5-94 | 440R-W23219 |
| MSR320P Input Module | — | 2 PNP Solid State | Removable | — | 24V DC from the base unit | 5-98 | 440R-W23218 |







Note: For additional Safety Relays connectivity, see the Safety Relays section (page 5-8) of this catalog.
 For additional Safety I/O and Safety PLC connectivity, see the Programmable Safety System section (page 5-107) of this catalog.
 For application and wiring diagrams, see the Safety Applications section (page 10-1) of this catalog.

Connection Systems

| Description | 4-Pin Micro (M12) | 5-Pin Micro (M12) | 8-Pin Micro (M12) | 12-Pin M23 |
|------------------|-------------------|-------------------|-------------------|--------------|
| Cordset | 889D-F4AC-* | — | 889D-F8AB-* | 889M-FX9AE-* |
| Patchcord | 889D-F4ACDM-* | 889D-F5ACDM-* | 889D-F8ABDM-* | — |
| Distribution Box | 898D-P4†LT-DM4 | — | — | — |
| Shorting Plug | 898D-41LU-DM | — | — | — |
| T-Port | 898D-43LY-D4 | — | — | — |

* 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.
 † Replace symbol with 4 or 8 for number of ports.
Note: For additional information, see the Safety Connection System section (page 7-1) of this catalog.

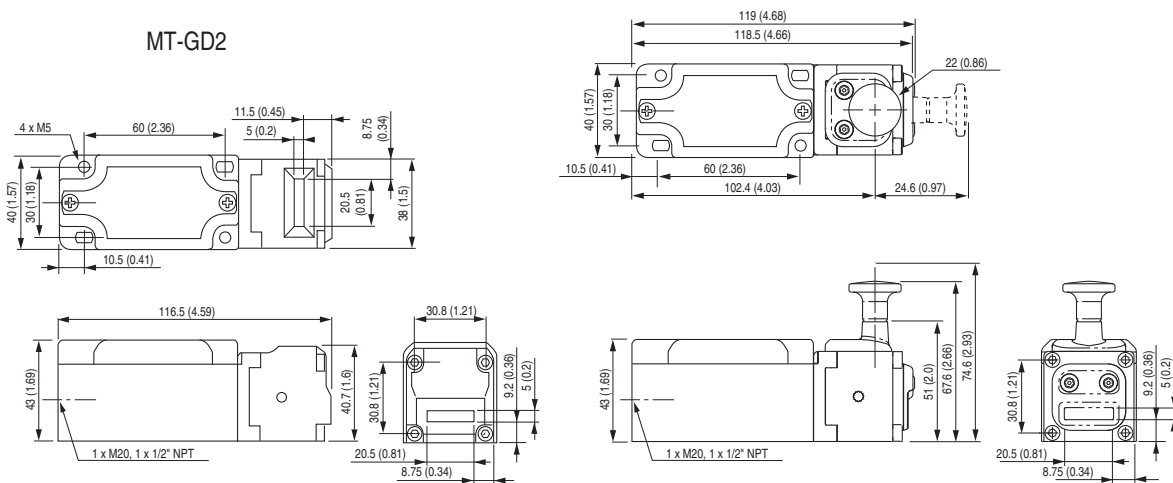
Accessories

| | Description | Dimensions | Cat. No. |
|---|------------------------|------------|-------------|
|  | GD2 standard actuator | 3-50 | 440G-A27011 |
|  | GD2 flat actuator | 3-51 | 440K-A11112 |
|  | Fully flex actuator | 3-50 | 440G-A27143 |
|  | Sliding bolt actuator | 3-55 | 440G-A27163 |
|  | Extended flat actuator | 3-51 | 440K-A17116 |
|  | Dust Cover | — | 440K-A17180 |

Approximate Dimensions

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

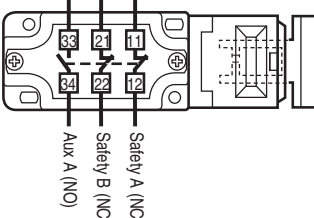
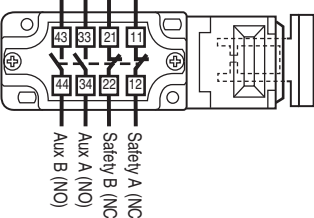
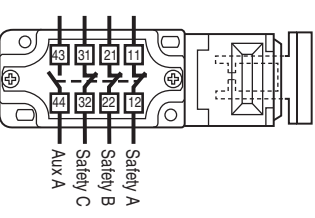
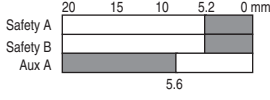
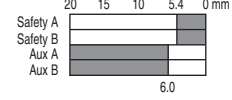
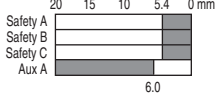
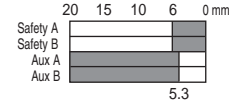
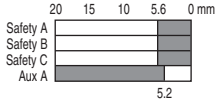
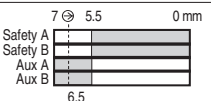


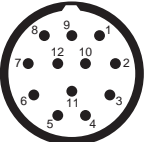
MT-GD2 Latch Release



Note: 2D, 3D and electrical drawings are available on www.ab.com.

Safety Switches
Tongue Switches
 MT-GD2

Typical Wiring Diagrams

| Description | | 2 N.C. & 1 N.O. | 2 N.C. & 2 N.O. | 3 N.C. & 1 N.O. |
|--|--|--|---|--|
| Contact Configuration | |  |  |  |
| Contact Action | |  <p>BBM</p> |  <p>BBM</p> |  <p>BBM</p> |
| | □ Open ■ Closed | — |  <p>MBB</p> |  <p>MBB</p> |
| | | — |  <p>Snap Acting</p> | — |
| 5-Pin Micro (M12) for Connection to ArmorBlock Guard I/O | | — |  | — |
| 8-Pin Micro (M12) | | — |  | — |
| 12-Pin Cordset |  <p>Pins 2, 5 and 11 are not connected.</p> | 1 and 3 Safety A 4 and 6 Safety B 7 and 8 NC 9 and 10 Aux A 12 Ground | Safety A Safety B Aux A Aux B Ground | Safety A Safety B Safety C Aux A Ground |
| 8-Pin Cordset 889D-F8AB-* | Grey Red Yellow Pink White Blue Green Brown | — | Safety A Safety B Aux A Ground Not Used | — |
| 12-Pin Cordset 889M-FX9AE-* | Brown Blue White Green Yellow Grey Pink Red Green/Yellow | Safety A Safety B Not Used Aux A Ground | Safety A Safety B Aux A Aux B Ground | Safety A Safety B Safety C Aux A Ground |

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

3-Interlock Switches