







Product Selection

Description	No. of P-Bolts	Cat. No.
	Installation Kit—5 m (16.4 ft)	3 440E-A13079
	Installation Kit—10 m (32.8 ft)	6 440E-A13080
	Installation Kit—15 m (49.2 ft)	8 440E-A13081
	Installation Kit—20 m (65.6 ft)	10 440E-A13082
	Installation Kit—30 m (98.4 ft)	14 440E-A13083
	Installation Kit—50 m (164 ft)	22 440E-A13084
	Installation Kit—75 m (246 ft)	32 440E-A13085

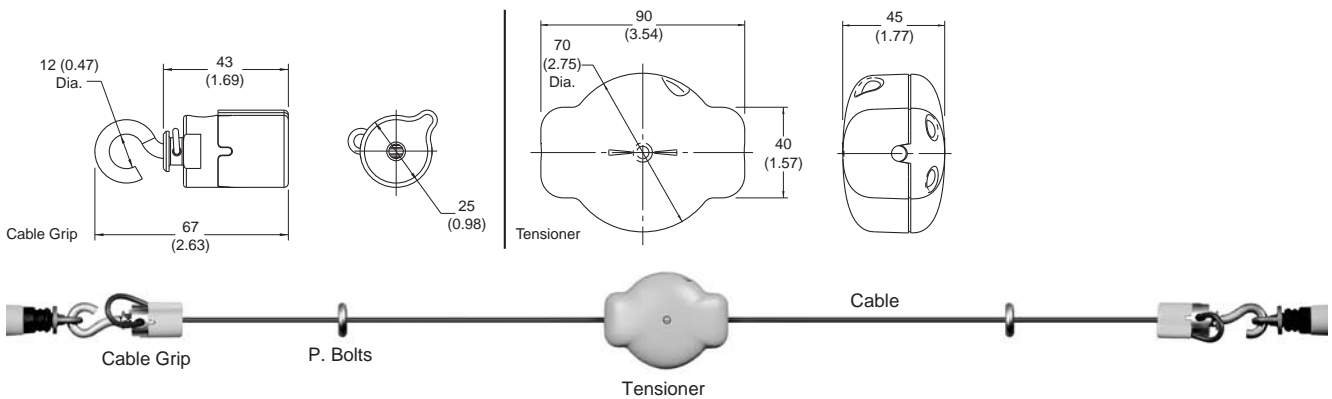
A stainless steel tensioner kit is available for use with the Lifeline 4 Stainless Steel, see page 4-18.

Accessories

Description	Cat. No.
	Lifeline tensioner and Allen key only 440E-A17105
	Lifeline gripper two pack 440E-A17107
	Lifeline gripper 20 pack 440E-A17106
	Lifeline tensioner, two grippers and Allen wrench 440E-A17112
	Two Lifeline tensioners, two grippers and Allen wrench 440E-A17140
 <p style="text-align: center;">Red Cable</p>	15 m (49.2 ft) 440E-A17026
	30 m (98.4 ft) 440E-A17027
	100 m (328 ft) 440E-A17028
	125 m (410 ft) 440E-A17129
	300 m (984 ft) 440E-A17095
	500 m (1640 ft) 440E-A17032
	UV resistant polypropylene covered steel cable
300 m (984 ft) 440E-A14740	

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.

4-Emergency Stop Devices



Description

The Lifeline 3 is a cable (rope) operated emergency stop device designed to meet the stringent requirements of ISO 13850 (Safety of Machinery—Emergency Stop Equipment). The Lifeline 3 system can be installed along or around awkward machinery such as conveyors and provides a constant-access emergency-stop facility.

1. The positive-mode mechanism helps ensure that the contacts are immediately latched open on actuation and can only be reset by the intentional action of turning the blue reset knob. The design also protects against nuisance tripping and the effects of thermal expansion.
2. The cable-status indicator makes the system easy to set up and maintain for spans up to 30 m (98 ft).
3. Four sets of contacts are provided: 2 N.C. + 2 N.O., or 3 N.C. + 1 N.O. contacts.
4. Sealed to IP 67 with rugged construction using die-cast alloy and stainless steel to withstand harsh conditions.

Features

- Switches up to 30 m (98 ft) span
- Universal mounting and operation
- Switch lockout on cable pulled and cable slack
- Cable-status indicator on switch lid
- Industry standard fixing centers to DIN/EN 50041
- Quick disconnect styles available

Specifications

Safety Ratings					
Standards	ISO 13850, EN ISO 12100, IEC 60947-5-1, IEC 60947-5-5				
Safety Classification	Cat. 1 device per EN 954-1 May be suitable for use in Cat 3 or Cat 4 systems depending on the architecture and application characteristics				
Functional Safety Data *	B10d: > 2 x 10 ⁶ operations at min. load PFH _D : < 3 x 10 ⁻⁷ MTTFd: > 385 years May be suitable for use in performance levels Pl _e or Pl _d systems (according to ISO 13849-1:2006) and for use in SIL2 or SIL3 systems (according to IEC 62061) depending on the architecture and application characteristics				
Certifications	CE Marked for all applicable directives, cULus, TÜV, and CCC				
Outputs					
Safety Contacts *	2 N.C. direct-opening action	3 N.C. direct-opening action			
Auxiliary Contacts	2 N.O. direct-opening action	1 N.O. direct-opening action			
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
DC-13	(U _e)	24V			
	(I _e)	2 A			
Operating Characteristics					
Cable Span Between Switches, Max.	30 m (98 ft)				
Tensioning Force to Run Position	103 N (23.17 lbf) typical				
Tensioning Force to Lockout	188 N (42.3 lbf) typical				
Operating Force, Min.	<125 N (28.1 lb) at 300 mm deflection				
Actuation Frequency, Max.	1 cycle/s				
Operating Life @ 100 mA load	1 x 10 ⁶				
Environmental					
Enclosure Type Rating	IP67				
Operating Temperature [C (F)]	-25...80° (-13...176°)				
Physical Characteristics					
Housing Material	Heavy-duty painted zinc-based die-cast alloy				
Indicator Material	Glass-filled nylon				
Eye Nut Material	Stainless steel				
Weight [g (lb)]	610 (1.34)				
Color	Yellow body, blue reset button				

* Usable for ISO 13849-1:2006 and IEC 62061. Data is based on the B10d value given and:

- 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.

Note: It is recommended that the LRTS (Lifeline Rope Tensioning System) should be used with the Lifeline 3 cable rope switch.

Product Selection

Contacts		Cat. No.				
Safety	Auxiliary	Conduits		Connectors*		
		M20	1/2 inch NPT	12-Pin M23	8-Pin Micro (M12)*	Connect to ArmorBlock Guard I/O 5-Pin Micro (M12)†
2 N.C.	2 N.O.	440E-D13118	440E-D13120	440E-D13132	440E-D21BNYH	440E-D2NNNYS
3 N.C.	1 N.O.	440E-D13112	440E-D13114	440E-D13124	—	—

* 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 4-9 for wiring details.

† For connection to ArmorBlock Guard I/O. With a 5-pin micro (M12) connector, not all contacts are connected. See *Typical Wiring Diagram* on page 4-9 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	5-26	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
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	5-82	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 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 5-115) of this catalog.

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

Connection Systems

Description	5-Pin Micro (M12)*	8-Pin Micro (M12)	12-Pin M23
Cordset	—	889D-F8AB-§	889M-FX9AE-§
Patchcord	889D-F5ACDM-♣	889D-F8ABDM-♣	889M-F12AHMU->

§ 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 0M3 (0.3 m), 0M6 (0.6 m), 1 (1 m), 2 (2 m) or 3 (3 m) for standard lengths.

* To connect to ArmorBlock Guard I/O.

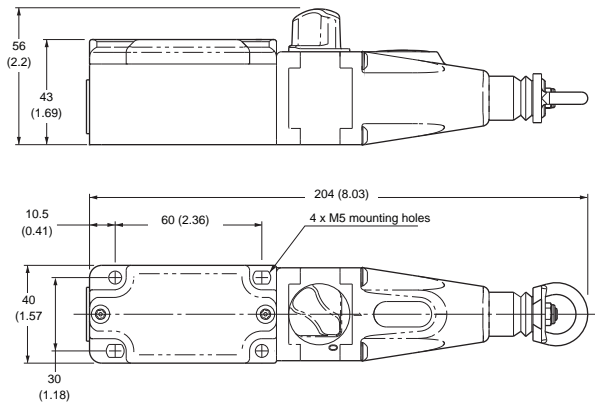
Operator Interface
Cable Pull Switches
 Lifeline™ 3

Accessories

Description		Cat. No.
	Lifeline P. bolt M8 x 1.25 thread size, 58 mm (2.28 in.) threaded length, 12 mm (0.47 in.) dia. eye, 95 mm (3.74 in.) overall length	440E-A17003
	Lifeline tensioner spring 19 mm (0.75 in.) diameter, 210 mm (8.27 in.) overall length, 50 N force	440E-A13078
	Lifeline inside corner pulley Internal diameter 16 mm (0.64 in.) zinc-plated mild steel	440A-A17101
	Lifeline outside corner pulley Outside diameter 38 mm (1.5 in.) zinc-plated mild steel	440A-A17102
	Blanking plug, M20 conduit	440A-A07265
	Cable grip, M20 conduit, accommodates cable diameter 7...10.5 mm (0.27...0.41 in.)	440A-A09028
	Adaptor, conduit, M20 to 1/2 inch NPT, plastic	440A-A09042
	Screwdriver including security bit	440A-A09018

Approximate Dimensions

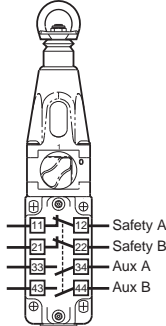
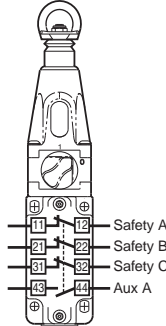
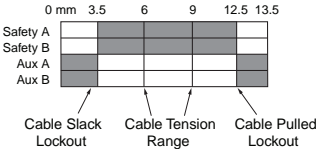
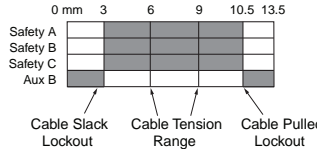
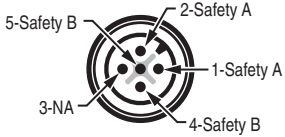
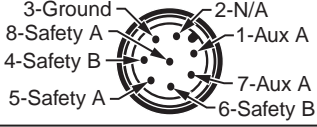
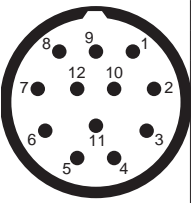
Dimensions are shown in mm (in.). Dimensions are not intended to be used for installation purposes.



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

4-Emergency
Stop Devices

Typical Wiring Diagrams

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

* Replace symbol with 2 (2 m), 5 (5 m), or 10 (10 m) for standard cable lengths.
 * Replace symbol with 0F5 (0.5 ft) or 1F (1 ft) for standard cable lengths.

4-Emergency Stop Devices



Description

The Lifeline 4 cable/push button operated system can be installed along or around awkward machinery such as conveyors and provide a constant emergency stop access.

The Lifeline 4 is the only device of its kind to incorporate the following features in one unit making it the most versatile cable switch on the market.

1. The positive mode mechanism helps ensure that the contacts are immediately latched open on actuation and can only be reset by the intentional action of turning the blue reset knob. The design also protects against nuisance tripping and the effects of thermal expansion.
2. A mushroom head emergency stop button is included on the unit to provide E-Stop access even at the extreme ends of the span.
3. The cable status indicator makes the system easy to set up and maintain for spans up to 125 meters.
4. Four sets of contacts are provided: 2 N.C. + 2 N.O. or 3 N.O. + 1 N.O. contacts
5. Sealed to IP66 with rugged construction using die-cast alloy and stainless steel to withstand harsh conditions.

Features

- Switches up to 125 meter span
- Universal mounting and operation
- Lid mounted emergency stop button, designed to conform to ISO 850
- Switch lockout on cable pulled and cable slack
- Cable status indicator on switch lid

Lid mounted E-Stop button

A mushroom head emergency stop button is included on the unit to provide total E-Stop access even at the extreme ends of the span.



Cable status indicator on lid

The cable status indicator makes the system easy to setup and maintain for spans up to 125 meters.



Specifications

Safety Ratings	
Standards	ISO 13850, EN ISO 12100, IEC 60947-5-1, IEC 60947-5-5
Safety Classification	Cat. 1 device per EN 954-1 May be suitable for use in Cat 3 or Cat 4 systems depending on the architecture and application characteristics
Functional Safety Data *	B10d: > 2 x 10 ⁶ operations at min. load PFH _D : < 3 x 10 ⁻⁷ MTTF _D : > 385 years May be suitable for use in performance levels Pl _e or Pl _d systems (according to ISO 13849-1:2006) and for use in SIL2 or SIL3 systems (according to IEC 62061) depending on the architecture and 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 *	2 N.C. direct-opening action	3 N.C. direct-opening action
Auxiliary Contacts	2 N.O. direct-opening action	1 N.O. direct-opening action
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
DC-13	(U _e)	24V			
	(I _e)	2 A			

Operating Characteristics	
Cable Span Between Switches, Max.	75 m (246 ft) standard model and 75...125 m (146...410 ft) extended length model
Tensioning Force to Run Position	103 N (23.16 lbf) typical
Tensioning Force to Lockout	188 N (42.3 lbf) typical
Operating Force, Min.	<125 N (28.1 lbf) at 300 mm deflection
Actuation Frequency, Max.	1 cycle/s
Operating Life @ 100 mA load	1 x 10 ⁶

Environmental	
Enclosure Type Rating	IP66
Operating Temperature [C (F)]	-25...80° (-13...176°)

Physical Characteristics	
Housing Material	Heavy-duty painted zinc-based die-cast alloy (LM24)
Indicator Material	Glass-filled nylon
Eye Nut Material	Stainless steel
Weight [g (lb)]	630 (1.38)
Color	Yellow body, blue reset button

- * Usable for ISO 13849-1:2006 and IEC 62061. Data is based on the B10d value given and:
 - 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.

Note: It is recommended that the LRTS (Lifeline Rope Tensioning System) should be used with the Lifeline 4 cable rope switch.

Product Selection

Cable Span	Safety Contacts	Auxiliary Contacts	Cat. No.				
			Conduits		Connectors*		
			M20	1/2 inch NPT	12-Pin M23	8-Pin Micro*	Connect to ArmorBlock Guard I/O 5-Pin Micro (M12)‡
75 m (246 ft)	2 N.C.	2 N.O.	440E-L13137	440E-L13133	440E-L13140	440E-L21BANYH	440E-L2NNNYS
	3 N.C.	1 N.O.	440E-L13042	440E-L13043	440E-L13141	—	—
75...125 m (146...410 ft)	2 N.C.	2 N.O.	440E-L13153	440E-L13155	440E-L13163	440E-L21BTYH	—
	3 N.C.	1 N.O.	440E-L13150	440E-L13152	440E-L13164	—	—

* For connector ratings, see page 3-9.

‡ For connection to ArmorBlock Guard I/O. With a 5-pin micro (M12) connector, not all contacts are connected. See page 4-15 for wiring details.

‡ With an 8-pin micro (M12) connector, not all contacts are connected. See page 4-15 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	5-26	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
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	5-82	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 5-4.

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	5-Pin Micro (M12)	8-Pin Micro (M12)	12-Pin M23
Cordset	—	889D-F8AB-§	889M-FX9AE-§
Patchcord	889D-F5ACDM-*	889D-F8ABDM-♣	889M-F12AHMU->

* Replace symbol with 0M3 (0.3 m), 1 (1 m), 2 (2 m), 3 (3 m), 5 (5 m), or 10 (10 m) for standard lengths.












§ 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 0M3 (0.3 m), 0M6 (0.6 m), 1 (1 m), 2 (2 m) or 3 (3 m) for standard length.










Operator Interface
Cable Pull Switches
 Lifeline™ 4

Accessories

	Description	Cat. No.
	Lifeline P. bolt	440E-A17003
	Lifeline tensioner spring	440E-A13078
	Replacement cover for Lifeline 4 cable/push button	440E-A13054
	Replacement cover for Lifeline 4 cable/push button, no E-Stop	440E-A17115
	Lifeline inside corner pulley	440A-A17101
	Lifeline outside corner pulley	440A-A17102
	Mounting bracket for Lifeline 4 cable/push button	440E-A17130
	Blanking plug, M20 conduit	440A-A07265
	Cable grip, M20 conduit, accommodates cable diameter 7...10.5 mm (0.27...0.41 in.)	440A-A09028
	Adaptor, conduit, M20 to 1/2 inch NPT, plastic	440A-A09042
	Screwdriver including security bit	440A-A09018

4-Emergency
 Stop Devices

Accessories (continued)

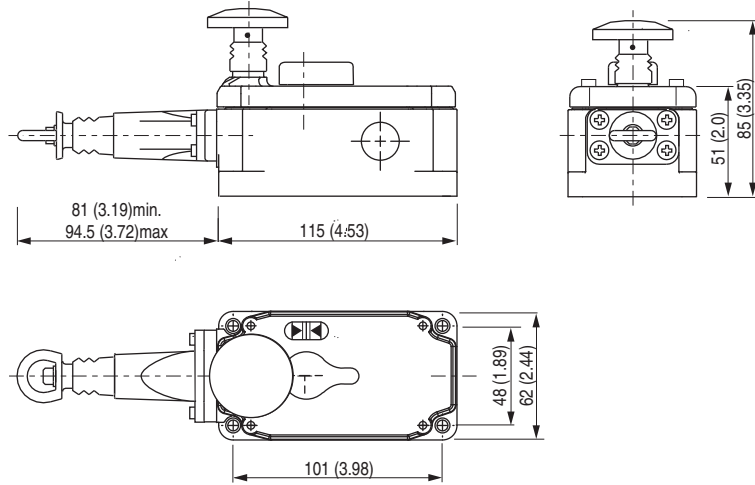
	Description	Cat. No.
	Indicator, M20 Conduit Pilot Light—Amber Lens T-3 1/4 Insert Use T-3 1/4 Bulb (Sold Separately)	440A-A19001
	Indicator, 1/2in NPT Conduit Pilot Light—Amber Lens T-3 1/4 Insert Use T-3 1/4 Bulb (Sold Separately)	440A-A19005
	Indicator, M20 Conduit Pilot Light—Amber Lens Bayonet Style Insert Use LED Bulb (Sold Separately)	440A-A17124
	Indicator, 1/2in NPT Conduit Pilot Light—Amber Lens Bayonet Style Insert Use LED Bulb (Sold Separately)	440A-A17122
	Indicator, M20 Conduit Pilot Light—Red Lens T-3 1/4 Insert Use T-3 1/4 Bulb (Sold Separately)	440A-A19002
	Indicator, 1/2in NPT Conduit Pilot Light—Red Lens T-3 1/4 Insert Use T-3 1/4 Bulb (Sold Separately)	440A-A19007
	Indicator, M20 Conduit Pilot Light—Red Lens Bayonet Style Insert Use LED Bulb (Sold Separately)	440A-A17125
	Indicator, 1/2in NPT Conduit Pilot Light—Red Lens Bayonet Style Insert Use LED Bulb (Sold Separately)	440A-A17123
	Bulb, 24V for Conduit Pilot Light 2.8W T-3 1/4 Bulb, Miniature Screw Base	440A-A09056
	Bulb, 110V for Conduit Pilot Light 2.6W T-3 1/4 Bulb, Miniature Screw Base	440A-A09055
	Bulb, 240V for Conduit Pilot Light 0.75W T-3 1/4 Bulb, Miniature Screw Base	440A-A09054
	Red LED Bulb, 24V AC/DC for Conduit Pilot Light Bayonet Style Insert	800T-N319R
	Amber LED Bulb, 24V AC/DC for Conduit Pilot Light Bayonet Style Insert	800T-N319A
	Red LED Bulb, 120V AC for Conduit Pilot Light Bayonet Style Insert	800T-N320R
	Amber LED Bulb, 120V AC for Conduit Pilot Light Bayonet Style Insert	800T-N320A

Operator Interface
Cable Pull Switches
 Lifeline™ 4

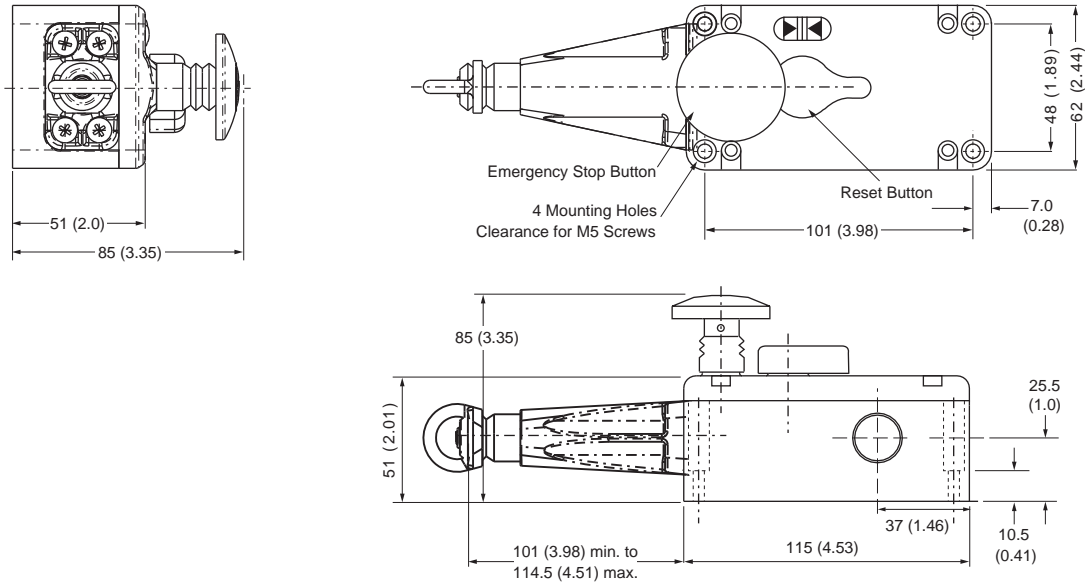
Approximate Dimensions

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

Standard Model



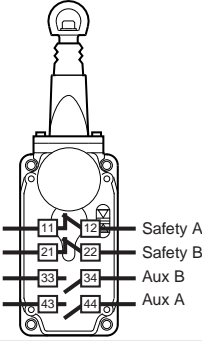
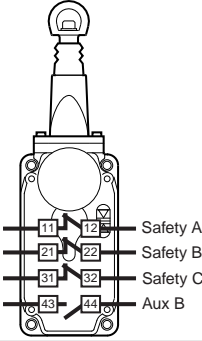
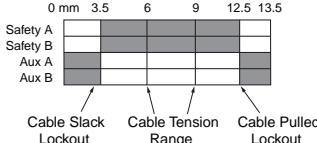
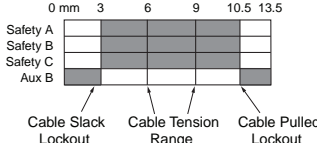
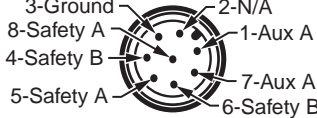
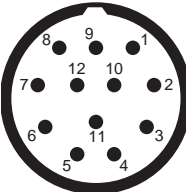
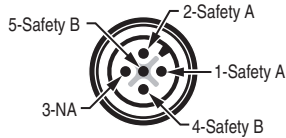
Extended Length Models (75...125 m cable span)



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

4-Emergency Stop Devices

Typical Wiring Diagrams

Description		2 N.C. & 2 N.O.	3 N.C. & 1 N.O.
Contact Configuration			
Contact Action		 <p>□ Open ■ Closed</p>	
8-Pin Micro (M12)			—
12-Pin M23  Pins 2, 5, 11 not connected	1-3	Safety A	Safety A
	4-6	Safety B	Safety B
	7-8	Aux A	Safety C
	9-10	Aux B	Aux A
	12	Ground	Ground
5-Pin Micro for ArmorBlock Guard I/O			—
8-Pin Cordset 889D-F8AB-*	Grey Red	Safety A	—
	Yellow Pink	Safety B	—
	White Blue	Aux A	—
	Green	Ground	—
	Brown	Not Used	
12-Pin Cordset 889M-FX9AE-*	Brown Blue	Safety A	Safety A
	White Green	Safety B	Safety B
	Yellow Grey	Aux A	Safety C
	Pink Red	Aux B	Aux A
	Green Yellow	Ground	Ground

* Replace symbol with 2 (2 m), 5 (5 m), or 10 (10 m) for standard cable lengths.
 * Replace symbol with 0F5 (0.5 ft) or 1F (1 ft) for standard cable lengths.

4-Emergency Stop Devices

Operator Interface

Cable Pull Switches

Lifeline™ 4 Stainless Steel



Description

The stainless steel Lifeline 4 cable/push button operated system can be installed along or around awkward machinery such as conveyors and provide a constant emergency stop access. This switch is made from stainless steel 316 and is suitable for external use, applications where there are hygiene requirements and other situations where a level of corrosion resistance is required.

The Lifeline 4 is the only device of its kind to incorporate the following features in one unit making it the most versatile cable switch on the market.

1. The positive mode mechanism helps ensure that the contacts are immediately latched open on actuation and can only be reset by the intentional action of turning the blue reset knob. The design also protects against nuisance tripping and the effects of thermal expansion.
2. A mushroom head emergency stop button is included on the unit to provide E-Stop access even at the extreme ends of the span.
3. The cable status indicator makes the system easy to set up and maintain for spans up to 75 meters.
4. Four sets of contacts are provided: 2 N.C. + 2 N.O.
5. Sealed to IP66 and IP69K with rugged construction using stainless steel 316 to withstand harsh conditions.

Features

- Switches up to 75 m (246 ft) span
- Universal mounting and operation
- Lid mounted emergency stop button, designed to conform to ISO 850
- Switch lockout on cable pulled and cable slack
- Cable status indicator on switch lid
- Made from stainless steel 316

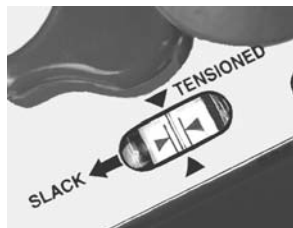
Lid mounted E-Stop button

A mushroom head emergency stop button is included on the unit to provide total E-Stop access even at the extreme ends of the span.



Cable status indicator on lid

The cable status indicator makes the system easy to setup and maintain for spans up to 75 m (246 ft).



Specifications

Safety Ratings	
Standards	EN 60947-5-5, ISO 13850, EN ISO 12100, IEC 60947-5-1
Safety Classification	Cat. 1 device per EN 954-1 May be suitable for use in Cat 3 or Cat 4 systems depending on the architecture and application characteristics
Functional Safety Data *	B10d: > 2 x 10 ⁶ operations at min. load PFH _D : < 3 x 10 ⁻⁷ MTTF _D : > 385 years May be suitable for use in performance levels Pl _e or Pl _d systems (according to ISO 13849-1:2006) and for use in SIL2 or SIL3 systems (according to IEC 62061) depending on the architecture and application characteristics
Note: For up-to-date information, visit http://www.ab.com/Safety/	
Certifications	CE Marked for all applicable directives, cULus Certified and TÜV
Outputs	
Safety Contacts *	2 N.C. direct opening action
Auxiliary Contacts	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
DC-13	(U _e) 24V (I _e) 2 A
Operating Characteristics	
Cable Span Between Switches, Max.	75 m (246 ft)
Tensioning Force to Run Position	103 N (23.17 lbf) typical
Tensioning Force to Lockout	188 N (42.3 lbf) typical
Operating Force, Min.	<125 N (28.1 lbf) at 300 mm deflection
Actuation Frequency, Max.	1 cycle/s
Operating Life @ 100 mA load	1 x 10 ⁶
Environmental	
Enclosure Type Rating	IP66, IP67, IP69K
Operating Temperature [C (F)]	-25...80° (-13...176°)
Physical Characteristics	
Housing Material	Stainless steel 316
Indicator Material	Acetal
Eye Nut Material	Stainless steel
Weight [g (lb)]	1442 (3.17)
Color	Unpainted metal
* Usable for ISO 13849-1:2006 and IEC 62061. Data is based on the B10d value given and: - 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.	
Note: It is recommended that the stainless steel installation kit should be used with the stainless steel Lifeline 4 as it is made of suitable materials for harsh conditions.	

Product Selection

Cable Span	Safety Contacts	Auxiliary Contacts	Cat. No.		
			Conduits		Connectors§
			M20	1/2 inch NPT	12-Pin M23
Up to 75 m (246 ft)	2 N.C.	2 N.O.	440E-L22BNSM	440E-L22BNST	440E-L22BNSL

§ For connector ratings, see 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	5-26	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
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	5-82	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 5-4.
 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	12-Pin M23
Cordset	889M-FX9AE-*
Patchcord	889M-F12AHMU-*

* Replace symbol with 2 (2 m), 5 (5 m), or 10 (10 m) for standard cable lengths.
 * Replace symbol with 0M3 (0.3 m), 0M6 (0.6 m), 1 (1 m), 2 (2 m) or 3 (3 m) for standard length.

Operator Interface
Cable Pull Switches
 Lifeline™ 4 Stainless Steel

Accessories

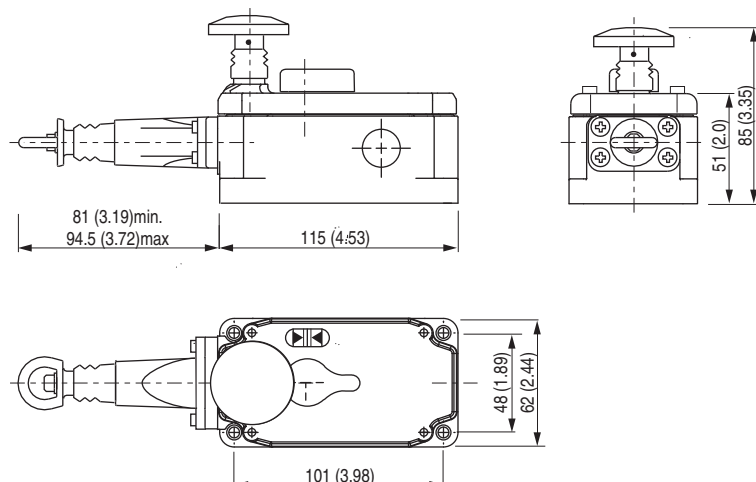
	Description	Eye Bolts	Cat. No.
	Stainless steel installation kit—5 m (16.4 ft)—polypropylene	4	440E-A13194
	Stainless steel installation kit—10 m (32.8 ft)—polypropylene	4	440E-A13195
	Stainless steel installation kit—15 m (49.2 ft)—polypropylene	7	440E-A13196
	Stainless steel installation kit—20 m (65.6 ft)—polypropylene	8	440E-A13197
	Stainless steel installation kit—30 m (98.4 ft)—polypropylene	12	440E-A13198
	Stainless steel installation kit—50 m (164 ft)—polypropylene	20	440E-A13199
Polypropylene Covered Steel Cable	Stainless steel installation kit—75 m (246 ft)—polypropylene	30	440E-A13200
	Stainless steel installation kit—5 m (16.4 ft)—UV resistant	4	440E-A13220
	Stainless steel installation kit—10 m (32.8 ft)—UV resistant	4	440E-A13221
	Stainless steel installation kit—15 m (49.2 ft)—UV resistant	7	440E-A13222
	Stainless steel installation kit—20 m (65.6 ft)—UV resistant	8	440E-A13223
	Stainless steel installation kit—30 m (98.4 ft)—UV resistant	12	440E-A13224
	Stainless steel installation kit—50 m (164 ft)—UV resistant	20	440E-A13225
	UV Resistant Polypropylene-Covered Steel Cable	Stainless steel installation kit—75 m (246 ft)—UV resistant	30
	Stainless steel turn buckle kit (no cable)		440E-A13227
	Stainless steel 304 eyebolt complete M8 x 1.25 thread size, 58 mm (2.28 in) threaded length, 12 mm (0.47 in) dia. eye 95 mm (3.74 in) overall length		440E-A13201
	Stainless steel 316 tensioner spring, 19 mm (0.75 in) dia. 210 mm (8.27 in) overall length		440E-A13202
	Replacement Cover		440E-A13203
	Replacement cover no E-Stop		440E-A13204
	Stainless steel 316 inside corner pulley		440E-A13205
	Stainless steel outside corner pulley		440E-A13206

Note: Installation Kits include the following parts: one rope, one turnbuckle tensioner, four thimbles, eight rope grips and eyebolts, nuts and washers depending on the length of the rope.

Approximate Dimensions

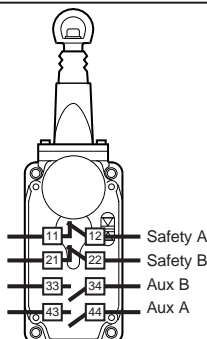
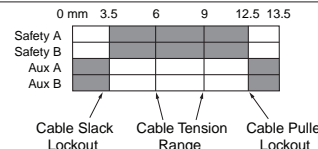
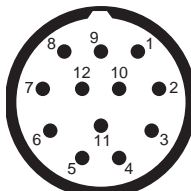
Dimensions are shown in mm (in.). Dimensions are not intended to be used for installation purposes.

Standard Model



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

Typical Wiring Diagrams

Description		2 N.C. & 2 N.O.										
Contact Configuration												
Contact Action	<input type="checkbox"/> Open <input checked="" type="checkbox"/> Closed											
12-Pin M23	 <p>Pins 2, 5, 11 not connected</p>	<table border="1"> <tr> <td>1-3</td> <td>Safety A</td> </tr> <tr> <td>4-6</td> <td>Safety B</td> </tr> <tr> <td>7-8</td> <td>Aux A</td> </tr> <tr> <td>9-10</td> <td>Aux B</td> </tr> <tr> <td>12</td> <td>Ground</td> </tr> </table>	1-3	Safety A	4-6	Safety B	7-8	Aux A	9-10	Aux B	12	Ground
1-3	Safety A											
4-6	Safety B											
7-8	Aux A											
9-10	Aux B											
12	Ground											
12-Pin Cordset 889M-FX9AE-*	<table border="1"> <tr> <td>Brown Blue</td> <td>Safety A</td> </tr> <tr> <td>White Green</td> <td>Safety B</td> </tr> <tr> <td>Yellow Grey</td> <td>Aux A</td> </tr> <tr> <td>Pink Red</td> <td>Aux B</td> </tr> <tr> <td>Green Yellow</td> <td>Ground</td> </tr> </table>	Brown Blue	Safety A	White Green	Safety B	Yellow Grey	Aux A	Pink Red	Aux B	Green Yellow	Ground	
Brown Blue	Safety A											
White Green	Safety B											
Yellow Grey	Aux A											
Pink Red	Aux B											
Green Yellow	Ground											

* Replace symbol with 0F5 (0.5 ft) or 1F (1 ft) for standard cable lengths.

4-Emergency Stop Devices

Operator Interface

Enabling Switches

Overview

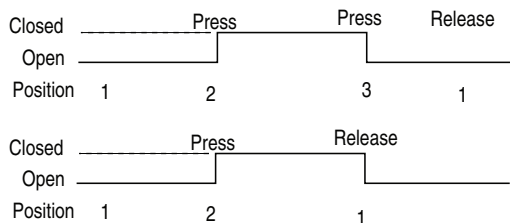
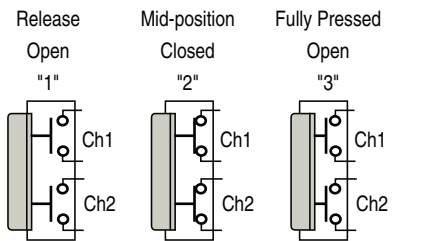


Overview

An enabling device is a manually operated control device used in conjunction with a start control. The safety function of the enabling switch has two parts: 1) when continuously actuated, the enabling device allows machine operation, and 2) when not actuated, the enabling device initiates a stop command to prevent machine operation.

Historically, many enabling devices used a two-position switch. In the event of an unexpected incident, the two-position switch is designed to open when the muscles relax. The three-position switch provides enhanced performance as it is designed to open when the muscles either relax or contract. The trend in machine safeguarding is towards the use of three-position switches. Various types of devices use the three-position switch as enabling devices. These are typically push buttons, grip switches and foot switches.

The Allen-Bradley Guardmaster 440J is a hand-operated grip style enabling device. Underneath the rubber boot, called the trigger switch, the 440J enabling device has two three-position switches. The contacts are closed when the actuator is in the mid-position (partly depressed). The contacts are open when the actuator is in the rest (released) position and in the fully pressed position. When transitioning from fully pressed to released, the contacts remain open. The 440J meets the requirements of IEC 60947-5-8:2006, which was written to describe the performance and design requirements of three-position enabling devices.



Enabling devices are typically used when access to the hazardous portion of the machine is needed while the machine is running. Visual observations, minor adjustments, troubleshooting, calibration, tool changes, and lubrication are examples of tasks that may utilize an enabling device. Before accessing the machine, the operator must usually place the machine in a reduced performance role. A risk assessment must be performed to determine the level of reduced performance. The concept is that in the event of an unexpected event, the operator will either release or squeeze the actuator of the enabling device and disable the machine, prior to getting injured.

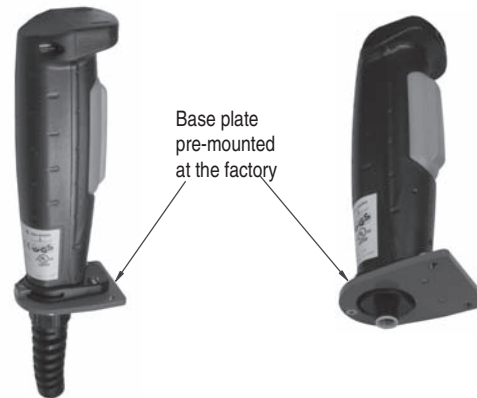
The 440J enabling switches come in three models: 1) standard switch with no additional buttons, 2) switch with an additional single normally open contact, and 3) switch with an additional dual channel e-stop button.

The model with the normally open contact is typically used as a jog or reset function. The safety system design must only allow the use of the jog or reset function when the trigger switch is in the mid-position.

The e-stop button has two normally closed contacts with direct opening action. The e-stop button latches when the contacts open per IEC 60947-5-5 and ISO 13850. When this model is selected with the quick disconnect option, the user must store the enabling switch in an out-of-sight location if it is disconnected.

Mounting Considerations

All three 440J enabling switches come with a base plate. All three models are offered with either a cable strain-relief or an M12 micro quick-disconnect connector.



Cable Strain Relief

M12 Micro Quick Disconnect

In some applications, the operation of the switch contacts is all that is needed. In this case, the holding bracket 440J-A00N is used.



440J-A00N



Additional accessory brackets can be added to achieve various arrangements. Cat. No. 440J-A01N right angle bracket is designed to accommodate Cat. No. 440K-A11238 (standard actuator) which is used with the standard Trojan 6 or Trojan T15 and Cat. No. 440G-A27011 (GD2 actuator) which is used with the GD2 interlocks.

4-Emergency Stop Devices



440J-A01N
 Bracket
 Shown with
 GD2 Actuator

With two additional screws, the right angle bracket can be mounted to the 440J enabling switch for horizontal mounting. An actuator can also be mounted for vertical use without the 440J-A01N bracket.



Shown with
 440G-A27011
 GD2 Actuator

Horizontal Mounting



Shown with
 440K-A11095
 Standard Actuator

Vertical Mounting



Horizontal Mount
 with MT-GD2

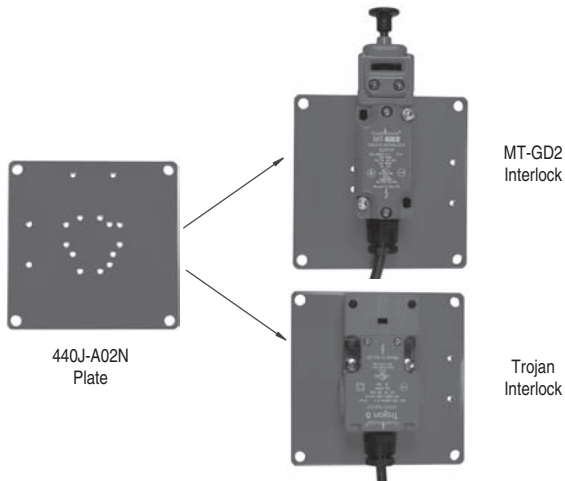


Vertical Mount
 with Trojan

In some applications, additional contacts are needed when the enabling switch is used. Two additional accessories are used to allow the enabling switch to interact with two interlocks.

Cat. No. 440J-A03N accessory mounts to the enabling switch base plate. This accessory has two sets of holes to accommodate either two standard or two GD2 actuators. This arrangement is used in conjunction with Cat. No. 440K-A04N accessory.

The mounting plate (Cat. No. 440J-A02N) has multiple pre-drilled and tapped holes to facilitate mounting of a single 440K-MT (MT-GD2) or 440K-T (Trojan) interlock. Four additional through-holes at the corners allow mounting of the plate to a flat surface.



440J-A02N
 Plate

MT-GD2
 Interlock

Trojan
 Interlock



440J-A03N



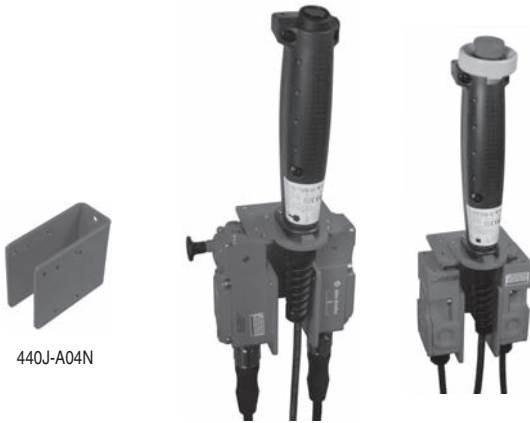
Enabling Switch mounted on
 440J-A03N, shown with
 two standard actuators

The U-shaped 440J-A04N can accommodate two interlocks: either 440K-MT or 440K-T. Using the 440J-A03N plate with dual actuators, a total of eight contacts, four in each switch, can be made available for the safety and control system.

The MT-GD2 with the manual latch release should be used for vertical mounting. The Trojan should only be used with horizontal actuator mounting. To use the 440K-T (Trojan 6 or T15), the head must be rotated 180°. The Trojan GD2 models cannot be used with the 440J-A02N as its head cannot be rotated.

The recommended method for single-switch mounting is to use the 440K-MT (MT-GD2) with the latch release. The latch holds the contacts closed when the enabling switch is bumped or rattled. An alternative is to use the 440K-T (Trojan 6 or T15) with a vertical mounting. The holding force of these interlocks is enough to keep the contacts closed under minor bumps and rattles.

Application Considerations



Dual Interlock Switches
 Provide Eight Contacts

Safety system designers will quickly realize that the enabling device by itself is easy to understand; it is simply a set of contacts. The application of the enabling device into a machine safeguarding system is the challenge.

Consideration must be given to the following:

1. Setting the machine in reduced performance mode.

In some cases, the speed or other characteristic of the machine must be reduced to allow the operator to avoid the hazard by releasing or squeezing the trigger switch. The control system must be designed so that the machine is not changed back to normal performance during the enabling task. A key-operated mode selector switch is one method of setting the machine in a reduced performance mode. The operator selects reduced mode and then removes the key from the switch, taking the key with him or her. Holding the trigger switch then allows the hazard to operate in a reduced mode.

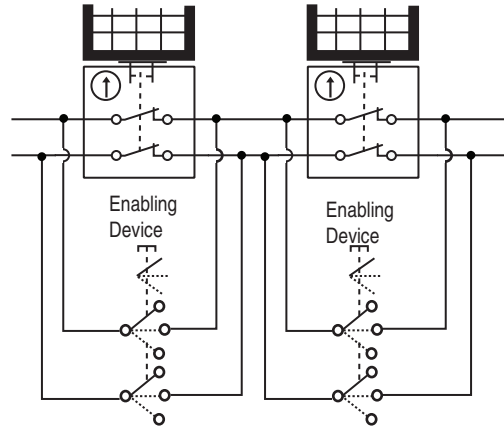
2. Knowing the machine is in reduced performance mode

Sensors can be used to determine that reduced performance of the machine is maintained. Position sensors, encoders or other devices, monitored by an appropriated logic device, provide feedback to the control system. If the performance (e.g., operating speed) were to increase beyond a predetermined limit, the control system would execute a stop command. Releasing the enabling device could also be used to execute a stop command.

3. Type of access

The safety system architecture will differ depending on whether partial body or full body access is required.

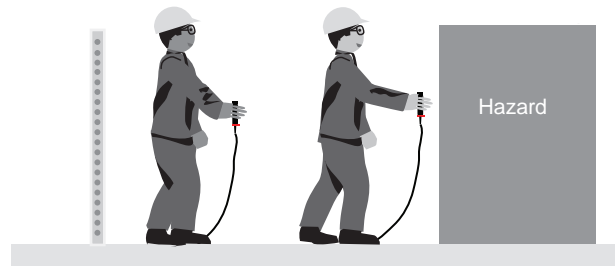
When partial body access is required, the enabling device must continuously bypass the primary safeguard (e.g. gate interlock, light curtain, safety mat, or safety scanner). Enabling devices must only bypass one primary safeguard—bypassing multiple safeguards with one enabling device must be avoided as access to the hazard may not be detected by the other bypassed safeguards.



If full body access is required, consideration must be given to whether the primary safeguard can or must be active during the operation of the enabling device. With the primary safeguard active, additional entries into the hazard area will be detected. If the primary safeguard must remain inactive, administrative procedures must ensure that additional personnel do not enter the hazard area.

4. Multiple Personnel Access

When more than one person must access the hazard, all persons must utilize their own enabling device. All enabling devices must be active to energize the hazard.



The table below summarizes when additional interlocking devices must be used in conjunction with the enabling device. For partial body access, three cases exist, depending on the type of device being bypassed and the logic unit used by the safety system.

1. The enabling switch can be connected directly across the safeguarding device that has dry contacts.
2. Devices with OSSD outputs, like the GuardShield Light curtain will need a single interlock with four contacts to avoid nuisance faults when a monitoring safety relay is used as the safety system logic device.
3. When a safety PLC is used as the logic device, the enabling device can be connected to separate inputs and internal programming logic can be used to bypass the light curtain when the enabling switch is needed.

For full body access, there are two cases, which depend on the logic device used by the safety system.

1. When a safety PLC is used, a single interlock with four contacts is needed. These four contacts are used to interlock the safety system reset function and the machine start function.
2. When a monitoring safety relay is used, two interlocks with four contacts each are needed. Four contacts are used to bypass the primary safeguarding device. Two contacts are used to reset the safety system. Two contacts are used to interlock the machine start control to prevent starting of the machine from the control panel.

Access Type	Safeguard Type	Logic Device	Interlocks Required
Partial Body	Dry Contact Interlocks (e.g., Elf, Cadet, Trojan, MT-GD2, Sipha, Ferrogard, 440G-MT, TLS-GD2, Atlas)	Monitoring Safety Relay or Safety PLC	None
		Safety PLC	
	Devices with OSSD Outputs (e.g., GuardShield Light Curtain, SensaGuard, SafeZone Multizone)	Monitoring Safety Relay	Single Interlock with Four Contacts
Full Body	All Types	Safety PLC	Single Interlock with Four Contacts
		Monitoring Safety Relay	Dual Interlocks, each with Four Contacts



Description

The three position enabling switch can be used as part of the conditions required to allow safe working inside a machine guard, e.g., set-up, maintenance, or troubleshooting. It is lightweight and ergonomically designed for easy use. The standard model includes two independent three-position switches which are actuated by squeezing the trigger. Additional models are available with an optional jog button or dual channel e-stop button.

The trigger switch has three positions. The mid-position is the “enabled” position.

Position 1—there is no pressure on the trigger switch, and the safety contacts are open.

Position 2—the trigger switch is squeezed to the mid-position, and the safety contacts are closed. This mid-position is the “enabled” position.

Position 3—the trigger switch is fully pressed and the safety contacts are open.

When the trigger switch is released from position three back to position one, the safety contacts remain open, as it passes through position two.

Features

- Dual three position enabling switches
- Lightweight and ergonomic
- Optional jog and e-stop functions

Specifications

Safety Ratings				
Standards	IEC/EN60947-5-8, IEC/EN 60947-5-1, IEC/EN 60204-1, NFPA 79, ANSI B11.19, ANSIR15.06, ISO 10218, ISO 11161			
Safety Classification	Cat. 1 Device per EN954-1; Dual channel suitable for Cat. 3 or 4 systems			
Certifications	CE Marked for all applicable directives, cULus Listed, BG			
Outputs				
Safety Contacts *	2 N.C. direct opening action			
Auxiliary Contacts	1 N.C.			
Jog Contact	1 N.O.			
E-Stop	2 N.C. Direct-Opening Action			
Thermal Current/ I_{th}	3 A			
Rated Insulation Voltage	(Ui) 250V (jog button 125V)			
Switching Current @ Voltage, Min.	5 mA @ 3V AC/DC			
Utilization Category		30V DC	125V AC	250V AC
3-Position Switch Terminals 1-2 and 3-4	DC-12 or AC-12 Resistive	2 A	3 A	0.5 A
	DC-13 or AC-15 Inductive	1 A	1.5 A	0.5 A
Monitor Switch Terminals 5-6	DC-12 or AC-12 Resistive	2 A	2 A	1 A
	DC-13 or AC-15 Inductive	1 A	1 A	0.5 A
E-Stop Switch Terminals 5-6 and 7-8	DC-12 or AC-12 Resistive			
	DC-13 or AC-15 Inductive			0.5 A
Operating Characteristics				
Operating Force, Min.	Position 2: 15 N (3.37 lbf) approx. Position 3: 50 N (11.2 lbf) max.			
Direct Opening Force	90 N (20 lbf)			
Actuation Frequency, Max.	1200 operations per hour			
Environmental				
Enclosure Type Rating	IP66 Standard Switch (NEMA 6) IP65 Jog Button and E-Stop Switches			
Relative Humidity	45...85%			
Operating Temperature [C (F)]	-10...+60° (14...140°)			
Vibration	5...55 Hz, 0.5 mm			
Shock	10 g			
Physical Characteristics				
Wire Size	0.14...1.5 mm ² (24...14 AWG)			
Cable Size	7...13 mm (0.27... 0.51 in.)			
Terminal Screw Torque	0.5...0.6 N•m (4.4...5.3 ibf•in)			
Conduit Type	M20			
Material	Polyamide (Nylon) PA66			
Boot Material	NBR/PVC Nitrile Blended with PVC			
Weight [g (lb)]	250 (0.55) with E-stop 210 (0.46) standard and jog			
Color	Black/grey			

* 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

Description	Cat. No.
	M20 Conduit with Cable Strain Relief
Standard Switch (No additional buttons)	440J-N21TNPM
Switch with Jog Button	440J-N21TNPM-NP
Switch with Emergency Stop Button	440J-N2NTNPM-NE

Note: Base plate included with all switches.

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	5-26	440R-N23135
MSR127TP	3 N.O.	1 N.C.	Removable (Screw)	Auto./Manual	24V AC/DC	5-26	440R-N23132
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 5-4.
 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	Cat. No.		
	4-Pin Micro (M12) Quick Disconnect	5-Pin Micro (M12) Quick Disconnect†	8-Pin Micro (M12) Quick Disconnect
Cordset	889D-F4AC-*	889D-F5AC-*	889D-F8AB-*
Patchcord	889D-F4ACDM-§	889D-F5ACDM-§	889D-F8ABDM-§

* 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), 5 (5 m), or 10 (10 m) for standard cable lengths.
 † To connect to ArmorBlock Guard I/O.

Operator Interface
Enabling Switches
 GripSwitch

Accessories

	Description	Cat. No.
	Mounting bracket suitable for single enabling switch*	440J-A00N
	Mounting bracket suitable for one actuator mounted onto switch* Includes four flat head screws and one resistorx bit.	440J-A01N
	Mounting bracket suitable for single enabling switch and single safety switch*	440J-A02N
	Mounting bracket suitable for two actuators mounted onto switch* Includes six flat head screws and one resistorx bit.	440J-A03N
	Mounting bracket suitable for single enabling switch and two safety switches*	440J-A04N
	NBR/PVC (silicone free) rubber boot kit	440J-A10N

* The bracket has predrilled holes suitable for mounting either the MT-GD2, Trojan 5, or Trojan 6. Please note that the enabling switch, safety switch, and actuator are not supplied with the mounting bracket and are available separately.