

Technical Data

Original Instructions



Allen-Bradley

by ROCKWELL AUTOMATION

Guardmaster®

Emergency Stop Devices

Bulletin Numbers 440E, 440J

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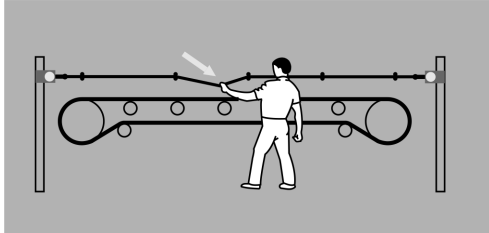
Summary of Changes

This publication contains the following new or updated information. This list includes substantive updates only and is not intended to reflect all changes.

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Updated Enabling Switch Overview	25

A cable pull device is a convenient and effective emergency stop device along the hazardous area (see [Figure 1](#)). Cable pull devices use a steel wire cable (rope) that connects to cable pull switches so if you pull on the cable in any direction at any point along its length, the switch trips and cuts off the machine power.

Figure 1 - Cable Pull Device



The cable pull switches must detect both a pull and a release on the cable. The detection of the release (slack) confirms that the cable is not cut and is ready for use.

Rockwell Automation developed a unique Lifeline™ Rope Tensioner System (LRTS) for quicker installations.

Mounting Specifications

- Locate the first and last P-bolt/eyebolt as close as possible to the cable-pull-switch eyelet. Maintain adequate clearance (125 mm [4.9 in.]) from the cable grips to allow for free movement. This configuration delivers a straight and efficient pulling action on the cable pull switches.
- Additional P-bolts/eyebolts that are spaced 2...3 m (6...9 ft) apart help maintain the perpendicular pull force (F) and distance (d) within IEC60947-5-5 specifications of 200 N (45 lbf) and 400 mm (15.75 in.).
- We recommend you use a cable pull switch at both cable ends, especially in applications with long cable runs or cable runs going around bends. This configuration helps maintain that the safety function is fulfilled upon actuation of the cable in any direction.
- ISO 13850 requires that the entire length of the cable is within view when the reset is turned to the run position, or you must inspect the machine over the whole length of the cable before and after reset.

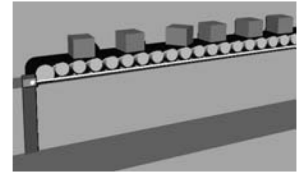
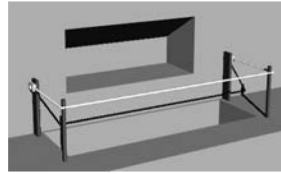
Table 1 - Selection Guide

Attribute	Lifeline 3	Lifeline 4	Stainless-steel Lifeline 4 ⁽¹⁾
Material	Painted zinc alloy	Painted aluminum alloy	316 stainless steel
Reset	Yes	Yes	Yes
E-stop	No	Yes	Yes
Cable span	30 m (98.42 ft)	75 m (246 ft) 125 m (410 ft) ⁽²⁾	75 m (246 ft)

(1) Use a dedicated stainless-steel installation kit.

(2) Extended model

Figure 2 - Typical Applications



- On shorter cable runs (10 m [32.8 ft], max), you can use a Lifeline tensioner spring at one end of the span. The installation must meet the previous requirements. When you use a spring, locate the last P-bolt/eyebolt as close as possible to the spring. Maintain adequate clearance (125 mm/5 in.) from the cable grips to allow for free movement. This configuration helps maintain that a pull near the end of the cable is between P-bolts/eyebolts results in the operation of the cable-pull-switch contacts instead of only movement in the spring.
- Confirm that the cable cannot become trapped or snagged. This design check is especially important when you use a tensioner spring because a cable snag between the location of the pull and the cable pull switch prevents the actuation of the safety function.
- When the installation is complete, perform a thorough functional test. This test includes checks on all types and directions of pull over the length of the cable and checks for slack-cable tripping.
- To determine whether to use two cable pull switches or one cable pull switch and a spring, perform a risk assessment that considers the probability of a trapped cable along the span.

Figure 3 - Extended Length Models

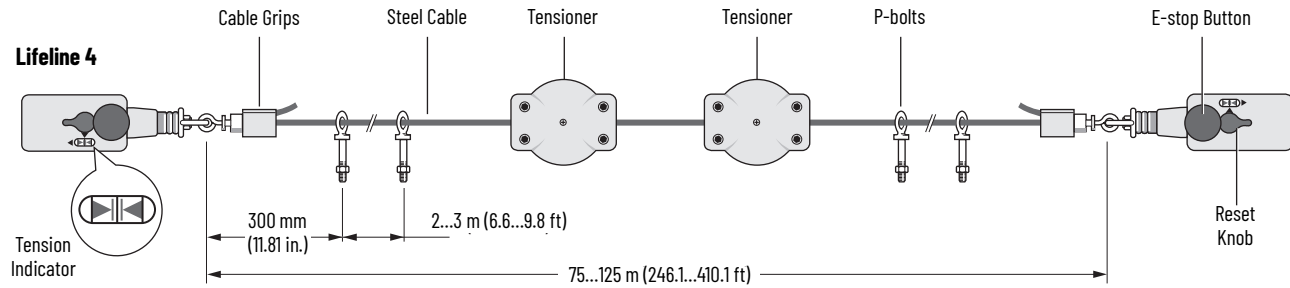


Figure 4 - Standard Cable Length Models

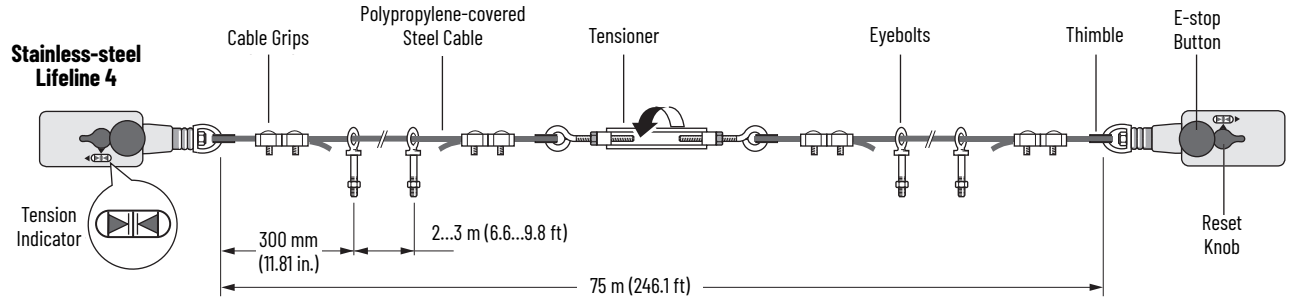
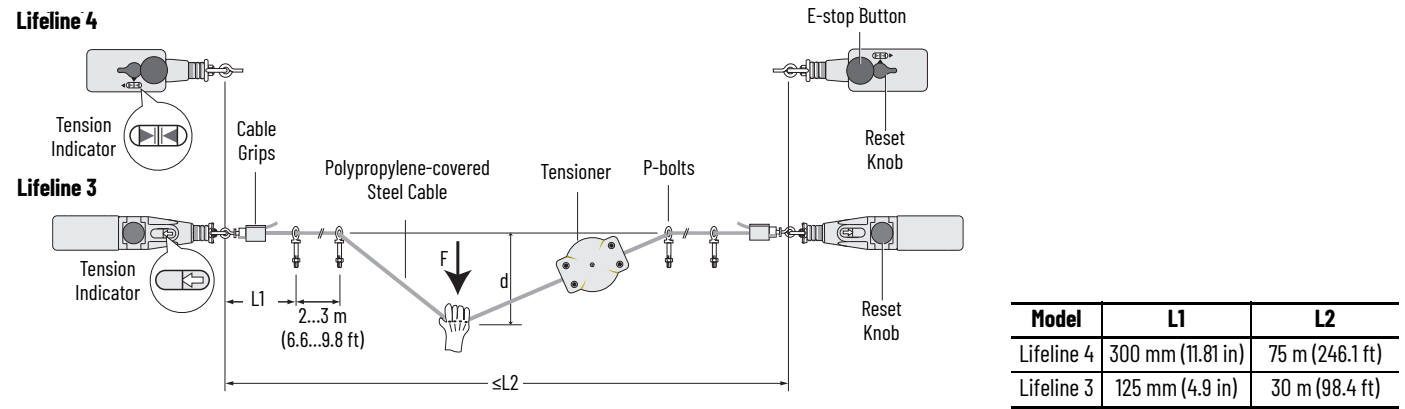
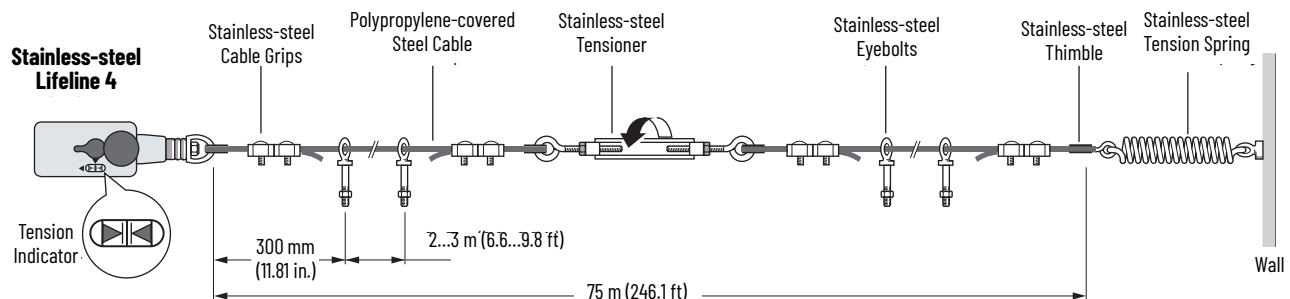
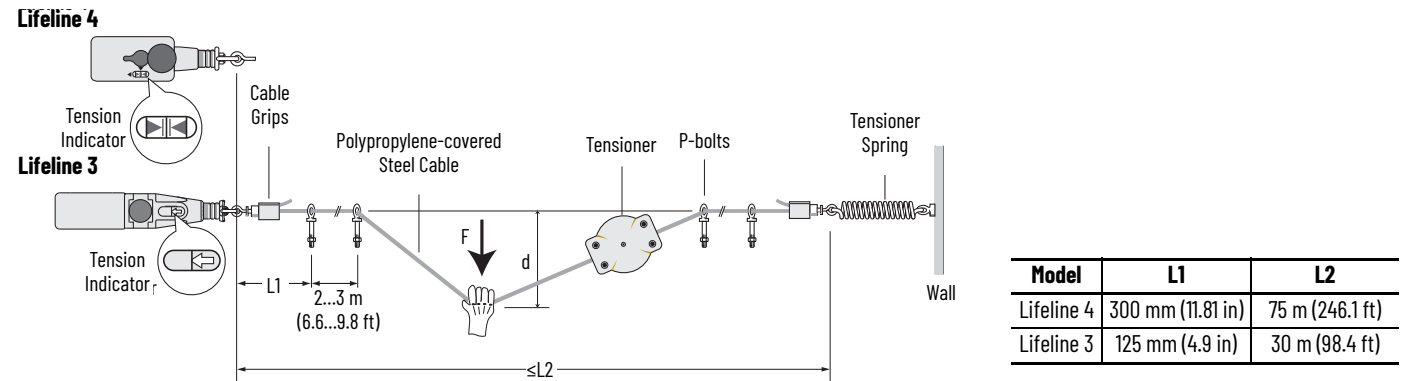


Figure 5 - Spring Tensioner



Lifeline 3 Cable Pull Switch



The Lifeline™ 3 Cable Pull Switch is a cable (rope) operated emergency stop device that meets the stringent requirements of ISO 13850 (Safety of Machinery—Emergency Stop Equipment). You can install the Lifeline 3 cable pull switch system along or around awkward machinery, such as conveyors, and provide a constant-access emergency stop facility.

We recommend you use the LRTS with a Lifeline 3 cable pull switch.

Features

- The positive-mode mechanism means the contacts immediately latch open upon actuation and can only reset with the blue reset knob. The design also helps prevent nuisance tripping and the effects of thermal expansion.
- The cable status indicator makes the system easy to build and maintain for spans up to 30 m (98 ft).
- The device has four sets of contacts: 2 N.C. + 2 N.O., or 3 N.C. + 1 N.O.
- Sealed to IP67 with rugged construction that uses die-cast alloy and stainless steel to withstand harsh conditions.
- Universal mounting and operation
- Switch lockout on cable pull and cable release
- Industry standard fixing centers to DIN/EN 50041
- Quick disconnect styles are available.

Specifications

Attribute	Lifeline 3 Cable Pull Switch			
Safety Ratings				
Standards	IEC 60947-5-5, ISO 13850, IEC 60947-5-1 Emergency stop device in accordance with ISO 13850			
Functional safety data	See SAFETY-SR001			
Certifications	cULus Listed, TÜV Certified, CE Marked for all applicable directives, and UKCA marked for all applicable regulations rok.auto/certifications			
Outputs				
Safety contacts ⁽¹⁾⁽²⁾	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 (Ui)	500V			
Switching current at voltage, min	3 mA at 18V DC			
Utilization category	A600/AC-15 (Ue) A600/AC-15 (Ie) DC-13 (Ue) DC-13 (Ie)	600V 1.2 A 24V 2 A	500V 1.4 A	240V 3.0 A 120V 6.0 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 (11.81 in.) deflection			
Actuation frequency, max	1 cycle/s			
Mechanical life	1,000,000 operations			
Environmental				
Enclosure type rating	IP67			
Operating temperature	-20...+80 °C (-4...+176 °F)			
Physical Characteristics				
Material	<ul style="list-style-type: none"> • Housing: Heavy-duty painted zinc-based die-cast alloy • Indicator: Glass-filled nylon • Eye nut: Stainless steel 			
Weight	610 g (1.34 lb)			
Color	Yellow body, blue Reset button			

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

(2) See [Product Selection on page 6](#).

Product Selection

Contacts		Cat. No.				
Safety	Auxiliary	Conduits		Connectors ⁽¹⁾		
		M20	1/2 inch NPT	12-pin M23	8-pin Micro (M12) ⁽²⁾	Connect to ArmorBlock Guard I/O 5-pin Micro (M12) ⁽³⁾
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	—	—

(1) For connector ratings, see [Table 2](#).

(2) With an 8-pin micro (M12) connector, not all contacts are connected. See [Typical Wiring Diagrams on page 7](#).

(3) For connection to ArmorBlock® Guard I/O™ modules. With a 5-pin micro (M12) connector, not all contacts are connected. See [Typical Wiring Diagrams on page 7](#).

Table 2 - Connector Ratings

	Max Ratings		Applicable Standards
	AC	DC	
4-pin Micro (M12)	250V, 4 A	250V, 4 A	IEC 61076-2-101:2003
5-pin Micro (M12)	60V, 4 A	60V, 4 A	IEC 61076-2-101:2003
8-pin Micro (M12)	30V, 2 A	30V, 2 A	IEC 61076-2-101:2003
12-pin M23	63V, 6 A	63V, 6 A	IEC 61984:2001

Table 3 - Connection Systems

Description	5-pin Micro (M12) ⁽¹⁾	8-Pin Micro (M12)	12-Pin M23
Cordset	—	889D-F8AB-x ⁽²⁾	889M-F12X9AE-x ⁽²⁾
Patchcord	889D-F5ACDM-y ⁽³⁾	889D-F8ABDM-y ⁽³⁾	889M-F12AHMU-z ⁽⁴⁾

(1) To connect to ArmorBlock Guard I/O modules.

(2) x = 2 (2 m [6.6 ft]), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) for standard cable lengths.

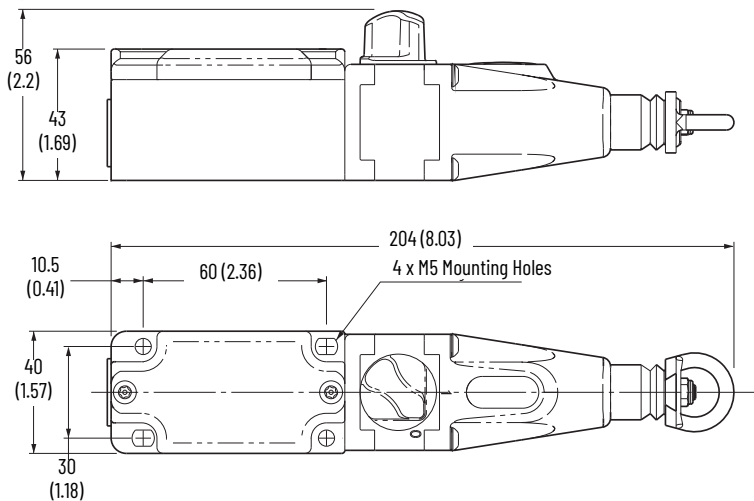
(3) y = 1 (1 m [3.3 ft]), 2 (2 m [6.6 ft]), 3 (3 m), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) for standard cable lengths.

(4) z = 0M3 (0.3 m [1 ft]), 0M6 (0.6 m [2 ft]), 1 (1 m [3.3 ft]), 2 (2 m [6.6 ft]) or 3 (3 m [9.8 ft]) for standard lengths.

Approximate Dimensions

Dimensions are not for installation purposes.

Figure 6 - Dimensions [mm (in.)]



Typical Wiring Diagrams

Description		2 N.C. and 2 N.O.	3 N.C. and 1 N.O.
Contact configuration			
Contact action □ Open ■ Closed			
5-pin Micro (M12) for ArmorBlock Guard I/O Modules			—
8-pin Micro (M12)			—
12-pin Cordset ⁽¹⁾ 	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-x ⁽²⁾	Gray Red	Safety A	
	Yellow Pink	Safety B	
	White Blue	Aux A	
	Green	Ground	
	Brown	Not Used	
12-pin Cordset 889M-F12X9AE-y ⁽³⁾	Brown Blue	Safety A	Safety A
	White Green	Safety B	Safety B
	Yellow Gray	Aux A	Safety C
	Pink Red	Aux B	Aux A
	Green/Yellow	Ground	Ground

(1) Pins 2, 5, and 11 are not connected.

(2) x = 2 (2 m [6.6 ft]), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) for standard cable lengths.

(3) y = 0F5 (0.5 ft [1.6 ft]) or 1F (1 ft [3.3 ft]) for standard cable lengths.

Notes:

Lifeline 4 Cable Pull Switch

You can install the Lifeline™ 4 Cable Pull Switch system along or around awkward machinery, such as conveyors, and provide a constant-access emergency stop facility.

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

We recommend you use the LRTS with the Lifeline 4 cable pull switch.



Standard Model
75 m (246 ft)



Extended Length Model
75...125 m (146...410 ft)

Features

- The positive-mode mechanism means the contacts immediately latch open upon actuation and can only reset with the blue reset knob. The design also helps prevent nuisance tripping and the effects of thermal expansion.
- The mushroom-shaped E-stop button provides E-stop access, even at the extreme ends of the span.
- The cable status indicator makes the system easy to build and maintain for spans up to 125 m (410 ft).
- The device has four sets of contacts: 2 N.C. + 2 N.O. or 3 N.O. + 1 N.O.
- Sealed to IP66 with rugged construction that uses die-cast alloy and stainless steel to withstand harsh conditions.
- Universal mounting and operation
- Switch lockout on cable pull and cable release
- Cable status indicator on switch lid

Specifications

Attribute	Lifeline 4 Cable Pull Switch				
Safety Ratings					
Standards	IEC 60947-5-5, ISO 13850, IEC 60947-5-1 Emergency stop device in accordance with ISO 13850				
Functional safety data	See SAFETY-SR001				
Certifications	cULus Listed, TÜV Certified, CE Marked for all applicable directives, and UKCA marked for all applicable regulations rok.auto/certifications				
Outputs					
Safety contacts ⁽¹⁾⁽²⁾	2 N.C. direct-opening action		3 N.C. direct-opening action		
Auxiliary contacts ⁽²⁾	2 N.O. direct-opening action		1 N.O. direct-opening action		
Thermal current I_{th}	10 A				
Rated insulation voltage (Ui)	500V				
Switching current at voltage, min	3 mA at 18V DC				
Utilization category	A600/AC-15 (Ue) A600/AC-15 (Ie) DC-13 (Ue) DC-13 (Ie)	600V 1.2 A 24V 2 A	500V 1.4 A	240V 3.0 A	120V 6.0 A
Operating Characteristics					
Cable span between switches, max	<ul style="list-style-type: none"> • Standard model 75 m (246 ft) • Extended length model 75...125 m (146...410 ft) 				
Tensioning force to run position	103 N (23.17 lbf) typical 6				
Tensioning force to lockout	188 N (42.3 lbf) typical				
Operating force, min	< 125 N (28.1 lbf) at 300 mm (11.8 in.) deflection				
Actuation frequency, max	1 cycle				
Mechanical life	1,000,000 operations				
Environmental					
Enclosure type rating	IP66				
Operating temperature	-25...+80 °C (-13...+176 °F)				
Physical Characteristics					
Material	<ul style="list-style-type: none"> • Housing: Heavy-duty painted zinc-based die-cast alloy (LM24) • Indicator: Glass-filled nylon • Eye nut: Stainless steel 				
Weight	630 g (1.38 lb)				
Color	Yellow body, blue reset button				

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

(2) See [Product Selection on page 10](#).

Product Selection

Cable Span	Safety Contacts	Auxiliary Contacts	Cat. No.				
			Conduits		Connectors ⁽¹⁾		
			M20	1/2 inch NPT	12-Pin M23	8-Pin Micro (M12) ⁽²⁾	Connect to ArmorBlock Guard I/O 5-pin Micro (M12) ⁽³⁾
75 m (246 ft)	2 N.C.	2 N.O.	440E-L13137	440E-L13133	440E-L13140	440E-L21BNYH	440E-L2NNYS
	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	—	—

(1) For connector ratings, see [Table 2 on page 6](#).

(2) With an 8-pin micro (M12) connector, not all contacts are connected. See [Typical Wiring Diagrams on page 12](#).

(3) For connection to ArmorBlock® Guard I/O™ modules. With a 5-pin micro (M12) connector, not all contacts are connected. See [Typical Wiring Diagrams on page 12](#).

Table 4 - Connection Systems

Description	5-pin Micro (M12)	8-pin Micro (M12)	12-pin M23
Cordset	—	889D-F8AB-w ⁽¹⁾	889M-F12X9AE-w ⁽²⁾
Patchcord	889D-F5ACDM-x ⁽²⁾	889D-F8ABDM-y ⁽³⁾	889M-F12AHMU-z ⁽⁴⁾

(1) w = 2 (2 m [6.6 ft]), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) for standard cable lengths.

(2) x = 0M3 (0.3 m [1 ft]), 1 (1 m [3.3 ft]), 2 (2 m [6.6 ft]), 3 (3 m [9.8 ft]), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) for standard lengths.

(3) y = 1 (1 m [3.3 ft]), 2 (2 m [6.6 ft]), 3 (3 m [9.8 ft]), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) for standard cable lengths.

(4) z = 0M3 (0.3 m [1 ft]), 0M6 (0.6 m [2 ft]), 1 (1 m [3.3 ft]), 2 (2 m [6.6 ft]), or 3 (3 m [9.8 ft]) for standard cable lengths.

Approximate Dimensions

Dimensions are not for installation purposes.

Figure 7 - Standard Model [mm (in.)]

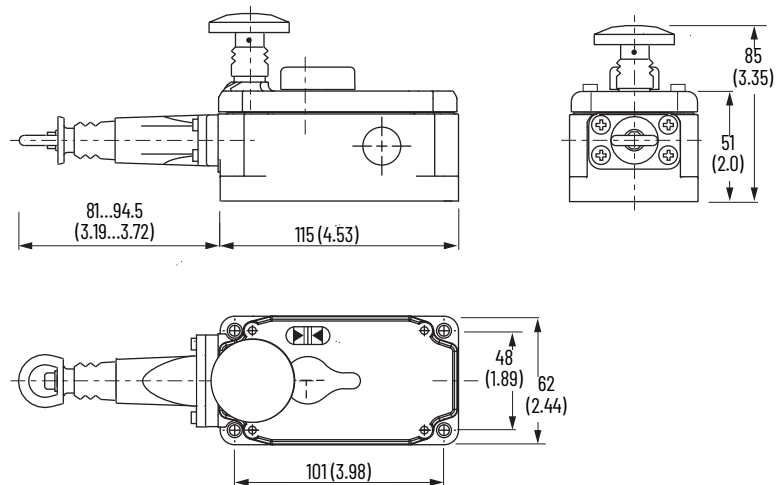
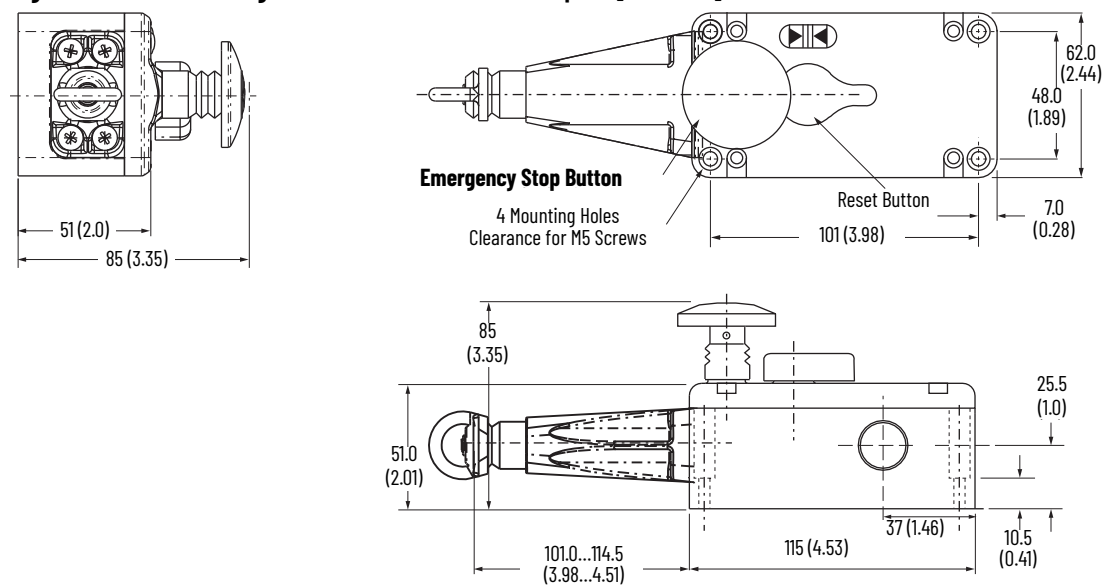


Figure 8 - Extended Length Models (75...125 m Cable Span) [mm (in.)] (a)



Typical Wiring Diagrams

Description		2 N.C. and 2 N.O.	3 N.C. and 1 N.O.
Contact configuration			
Contact action □ Open ■ Closed			
8-pin Micro (M12)			—
12-pin cordset ⁽¹⁾ 	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 modules 		—	—
8-pin cordset 889D-F8AB-x ⁽²⁾	Gray Red	Safety A	—
	Yellow Pink	Safety B	—
	White Blue	Aux A	—
	Green	Ground	—
	Brown	Not Used	—
12-pin cordset 889M-F12X9AE-x ⁽²⁾	Brown Blue	Safety A	Safety A
	White Green	Safety B	Safety B
	Yellow Gray	Aux A	Safety C
	Pink Red	Aux B	Aux A
	Green/Yellow	Ground	Ground

(1) Pins 2, 5, and 11 are not connected.

(2) x = 2 (2 m [6.6 ft]), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) for standard cable lengths.

Lifeline 4 Stainless Steel Cable Pull Switch

You can install the Lifeline™ 4 Stainless Steel Cable Pull Switch along or around awkward machinery, such as conveyors, and provide a constant-access emergency stop facility. This cable switch is made from stainless steel 316 and is suitable for external use, applications with hygiene requirements, and other situations that require a level of corrosion resistance.

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

Features

- The positive-mode mechanism means the contacts immediately latch open upon actuation and can only reset with the blue reset knob.
- The mushroom-shaped E-stop button provides E-stop access, even at the extreme ends of the span.
- The cable status indicator makes the system easy to build and maintain for spans up to 75 m (246 ft).
- The device has four sets of contacts: 2 N.C. + 2 N.O.
- Sealed to IP66 and IP69K with rugged construction that uses stainless steel 316 to withstand harsh conditions.
- Universal mounting and operation
- Switch lockout on cable pull and cable release
- Made from stainless steel 316
- IP69 rated

We recommend you use the stainless-steel installation kit with the stainless-steel Lifeline 4 cable pull switch because the kit is made of suitable materials for harsh conditions.



Stainless Steel Switch
without E-stop

Stainless Steel Switch
with E-stop

Specifications

Attribute	Lifeline 4 Stainless Steel Cable Pull Switch				
Safety Ratings					
Standards	IEC 60947-5-5, ISO 13850, IEC 60947-5-1 Emergency stop device in accordance with ISO 13850				
Functional safety data	See SAFETY-SR001				
Certifications	cULus Listed, TÜV Certified, CE Marked for all applicable directives, and UKCA marked for all applicable regulations rok.auto/certifications				
Outputs					
Safety contacts ⁽¹⁾	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 at voltage, min	3 mA at 18V DC				
Utilization category	A600/AC-15 (Ue) A600/AC-15 (Ie) DC-13 (Ue) DC-13 (Ie)	600V 1.2 A 24V 2 A	500V 1.4 A	240V 3.0 A	120V 6.0 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 lb) at 300 mm (11.8 in.) deflection				
Actuation frequency, max	1 cycle/s				
Mechanical life	1,000,000 operations				
Environmental					
Enclosure type rating	IP66, IP67, IP69K				
Operating temperature	-25...+80 °C (-13...+176 °F)				
Physical Characteristics					
Material	<ul style="list-style-type: none"> Housing: Stainless steel 316 Indicator: Acetal Eye nut: Stainless steel 				
Weight	1442 g (3.17 lb)				
Color	Unpainted metal				

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

Product Selection

E-stop	Safety Contacts	Auxiliary Contacts	Cat. No.		
			Conduits		Connectors ⁽¹⁾
			M20	1/2 inch NPT	12-Pin M23
Yes	2 N.C.	2 N.O.	440E-L22BNSM	440E-L22BNST	440E-L22BNSL
No			440E-L22BNSMNH	440E-L22BNSR	—

(1) For connector ratings, see [Table 2 on page 6](#)

Table 5 - Connection Systems

Description	12-pin M23
Cordset	889M-F12X9AE-x ⁽¹⁾
Patchcord	889M-F12AHMU-y ⁽²⁾

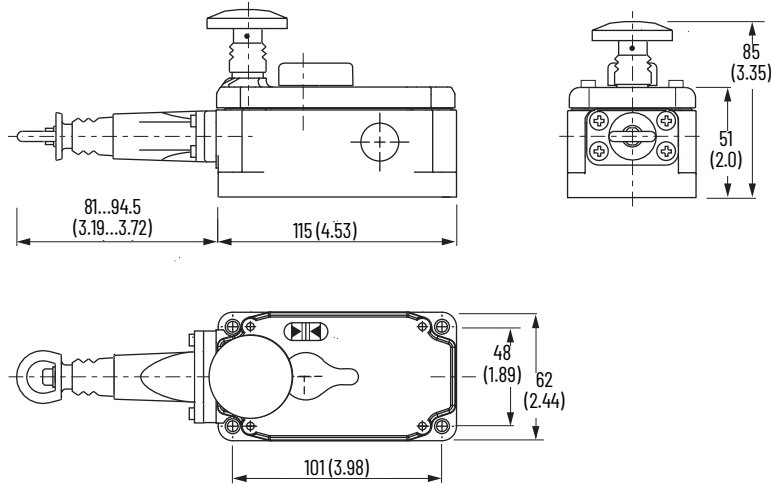
(1) x = 2 (2 m [6.6 ft]), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) for standard cable lengths.

(2) y = 0M3 (0.3 m [1 ft]), 0M6 (0.6 m [2 ft]), 1 (1 m [3.3 ft]), 2 (2 m [6.6 ft]), or 3 (3 m [9.8 ft]) for standard cable lengths.

Approximate Dimensions

Dimensions are not for installation purposes.

Figure 9 - Standard Model [mm (in.)]



Typical Wiring Diagrams

Description	2 N.C. and 2 N.O.	
Contact configuration	<p>Terminal connections: 11, 12: Safety A 21, 22: Safety B 33, 34: Aux B 43, 44: Aux A</p>	
Contact action <input type="checkbox"/> Open <input checked="" type="checkbox"/> Closed	<p>Chart Legend: 0 mm: Cable Slack Lockout 3.5 mm: Cable Tension Range 6 mm: Cable Tension Range 9 mm: Cable Tension Range 12.5 mm: Cable Pulled Lockout 13.5 mm: Cable Pulled Lockout</p>	
12-pin Cordset ⁽¹⁾	1...3	Safety A
	4...6	Safety B
	7...8	Aux A
	9...10	Aux B
	12	Ground
	12-pin cordset 889M-F12X9AE-x ⁽²⁾	Brown Blue
	White Green	Safety B
	Yellow Gray	Aux A
	Pink Red	Aux B
	Green/ Yellow	Ground

(1) Pins 2, 5, and 11 are not connected.

(2) x = 0F5 (0.5 ft) or 1F (1 ft) for standard cable lengths.

Notes:

Lifeline 5 Cable Pull Switch

The Lifeline™ 5 Cable Pull Switch is a microprocessor-based solution with advanced features and diagnostics that help enhance safety and improve productivity. The Lifeline 5 cable switch offers features and functions that simplify setup and allow for efficient maintenance and troubleshooting. The Lifeline 5 cable switch performs at the highest safety ratings (TUV certified to PLe, cat. 4, SIL 3).

The solid-state Lifeline 5 cable switch is offered in stainless steel (IP69K) or die-cast aluminum (IP66) housings with an optional emergency stop (E-stop) button. With constant access to the E-stop function, the Lifeline 5 cable switch has up to a 100 m (328 ft.) span with the ability to stop a machine hazard through a simple pull of the attached cable. Lifeline 5 cable switch operating temperatures range -20...+75 °C (-4...+167 °F) and constantly monitors cable tension and compensates for thermal expansion, cable sag, and spurious trips due to inadvertent strikes of the cable by objects or personnel. The 270° visible status indicators help with the tensioning of the cable for quick, precise setup and provides switch status and diagnostics during operation.

The Lifeline 5 cable switch is suitable for applications that require uninterrupted access to an E-stop. Key applications and industries include material handling equipment, distribution centers, and food and beverage applications.

Features

- Solid-state operation
- Enhanced safety and productivity with microprocessor-based reliability and advanced diagnostics
- Performs at the highest safety ratings, even in series connection
 - TÜV Certified
 - PLe, cat. 4 according to EN ISO 13849-1, SIL CL 3 per IEC 62061 and IEC 61508, EN ISO 13850, and IEC 60947-5-5
 - NFPA 79
- Rugged stainless steel (IP69K) or die-cast aluminum (IP66) housings with optional E-stop button
- Supports long cable spans up to 100 m (328 ft)
- Wide operating temperature range -20...+75 °C (-4...+167 °F)
- Electronic rope-monitoring system monitors the cable span and compensates for thermal expansion
- 270° visible status indicators offer diagnostic for switch and tensioning setup
- Built-in margin indication helps reduce downtime
- OSSD outputs
 - 2 OSSDs for safety
 - 1 auxiliary
 - 1 tension/margin (8-pin model only)



Aluminum Housing Standard Switch without E-stop



Aluminum Housing Standard Switch with E-stop



Stainless Steel Switch without E-stop

Specifications

Attribute	Lifeline 5 Cable Pull Switch		
	Aluminum Housing with E-stop	Aluminum Housing without E-stop	Stainless-steel Housing without E-stop
Safety Ratings			
Standards	<ul style="list-style-type: none"> IEC 60947-5-5, ISO 13850, IEC 60947-5-1 Emergency stop device in accordance with ISO 13850 PLe, cat. 4 according to ISO 13849-1, SIL 3 per IEC 62061 and IEC 61508 		
Functional safety data	See SAFETY-SR001		
Certifications	cULus Listed, TÜV Certified, CE Marked for all applicable directives, and UKCA marked for all applicable regulations rok.auto/certifications		
Outputs			
Safe state	De-energized (2 x PNP, OV), AUX energized (1 x PNP, 24V)		
Run state	Energized (2 x PNP, 24V), AUX de-energized (1 x PNP, OV)		
Tension	Energized (1 x PNP, 24V)		
No-load supply current	< 50 mA		
Load current	200 mA maximum		
Voltage drop	< 2V		
Operating Characteristics			
Cable span	100 m (328 ft)		
Tension force to run position	135 N (30.35 lbf)		
Tension force to lockout	195 N (43.84 lbf)		
Operating voltage	24V DC +10%/−15% Class 2 SELV or PELV power supply		
Response time (off)	60 ms		
Switches connected in series	Response time off is 5 ms for each additional switch		
Utilization Category DC-12 and DC-13 (Ue) DC-12 and DC-13 (Ie)	24V 200 mA		
Frequency of operating cycle	0.25 Hz		
Off-state output current	< 0.5 mA		
Environmental			
Operating temperature	−20...+75 °C (−4...+167 °F)		
Operating humidity	5...95% relative		
Housing material	Aluminum	Stainless steel 304	
Washdown rating	IP66	IP66, IP69K	
Shock and vibration	IEC 60068-2-27: 30 g, 11 ms IEC 60068-2-6: 10...500 Hz		
Pollution degree	IEC 60947-1: 3		
Electromagnetic Compatibility (EMC)			
Electrostatic discharge (ESD)	IEC 61000-4-2: Air discharge Per IEC 61326-1 (functional): 8 kV Per IEC 61000-6-7 (fail-safe): 8 kV IEC 61000-4-2: Contact discharge Per IEC 61326-1 (functional): 4 kV Per IEC 61000-6-7 (fail-safe): 6 kV		
Radiated EMF immunity	IEC 61000-4-3 Per IEC 61326-1 (functional): 10V/m Per IEC 61000-6-7 (fail-safe): 20V/m		
Electrical fast transient/burst immunity	IEC 61000-4-4 Per IEC 61326-1 (functional): 2 kV/5 kHz Per IEC 61000-6-7 (fail-safe): 2 kV/5 kHz		
Conducted immunity	IEC 61000-4-6 Per IEC 61326-1 (functional): 10V Per IEC 61000-6-7 (fail-safe): 20V		
Rated impulse withstand voltage	IEC 60947-1: 1 kV		
Protection	Short circuit, overload, reverse polarity, overvoltage, loss of ground		

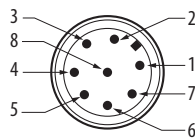
Product Selection

Description	Cat. No. ⁽¹⁾	Outputs	Connection	Connection Cable ⁽²⁾
Lifeline 5 with E-stop	440E-LL5SE5	2 OSSD outputs, 1 aux output	5-pin Micro (M12)	889D-F5AC-2
			5-pin Micro (M12) connects to ArmorBlock® Guard I/O™ Modules	889D-F4ACDM-2
	440E-LL5SE8	2 OSSD inputs, 2 OSSD outputs, 1 aux output, 1 tension output	8-pin Micro (M12)	889D-F8AB-2
Lifeline 5 without E-stop	440E-LL5SN5	2 OSSD outputs, 1 aux output	5-pin Micro (M12)	889D-F5AC-2
			5-pin Micro (M12) connects to ArmorBlock Guard I/O Modules	889D-F4ACDM-2
	440E-LL5SN8	2 OSSD inputs, 2 OSSD outputs, 1 aux output, 1 tension output	8-pin Micro (M12)	889D-F8AB-2
Lifeline 5 stainless steel without E-stop	440E-LL5SS5	2 OSSD outputs, 1 aux output	5-pin Micro (M12)	889DS-F5AC-2
			5-pin Micro (M12) connects to ArmorBlock Guard I/O Modules	889D-F4ACDM-2
	440E-LL5SS8	2 OSSD inputs, 2 OSSD outputs, 1 aux output, 1 tension output	8-pin Micro (M12)	889DS-F8AB-2

(1) Tension spring included.

(2) Replace the 2 with 5 (5 m [16.4 ft]) or 10 (10 m [32.8 ft]) for standard cable lengths.

Table 6 - 8-pin Connection



Pin Number	Wire Color	Signal
1	White	Auxiliary Output
2	Brown	24V DC
3	Green	Tension Output
4	Yellow	Safety OSSD 2 Input
5	Gray	Safety OSSD 1 Output
6	Pink	Safety OSSD 2 Output
7	Blue	0V
8	Red	Safety OSSD 1 Input

Table 7 - M12 8-pin Cordset

Description	Temperature Rating	Jacket Material	Coupling Nut	Cat. No. ⁽¹⁾
M12 8-pin cordset	-20...+105 °C (-4...+221 °F)	PVC	Epoxy-coated zinc	889D-F8AB-2
			Stainless steel	889DS-F8AB-2

(1) Replace the 2 with 5 (5 m [16.4 ft]) or 10 (10 m [32.8 ft]) for standard cable lengths.

Table 8 - 5-pin Connection



Pin Number	Wire Color	Signal
1	Brown	+24V
2	White	Safety OSSD 1 Output
3	Blue	0V
4	Black	Safety OSSD 2 Output
5	Gray	Auxiliary Output

Table 9 - M12 4- and 5-pin Cordsets

Description	Temperature Rating	Jacket Material	Coupling Nut	Cat. No. ^{(1) (2)}
M12 5-pin cordset	-20...+105 °C (-4...+221 °F)	PVC	Epoxy-coated zinc	889D-F5AC-2
			Stainless steel	889DS-F5AC-2
M12 4-pin cordset	-50...+105 °C (-58...+221 °F)	TPE	Stainless steel	889DS-F4HJ-2

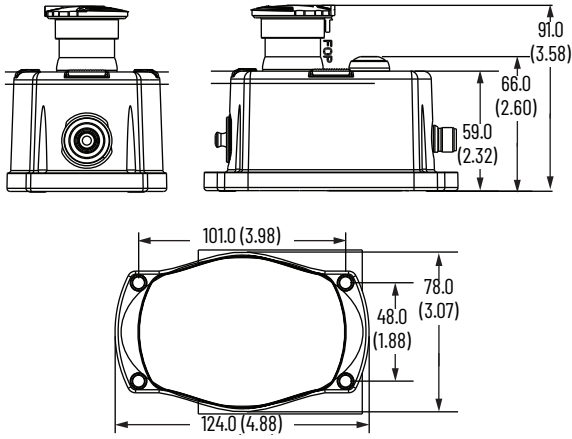
(1) Replace the 2 with 0M3 (0.3 m [0.98 ft]), 1 (1 m [3.28 ft]), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) for standard cable lengths.

(2) If you do not require the auxiliary signal, use a 4-pin cordset (Cat. No. 889D-F4AC-2). For low temperature applications, use a 4-pin cordset (Cat. No. 889DS-F4HJ-2).

Approximate Dimensions

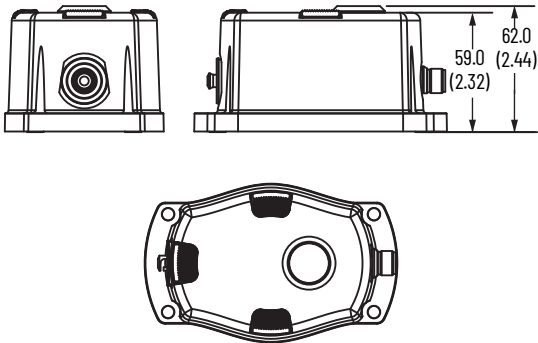
Dimensions are not for installation purposes.

Figure 10 - Standard Housing [mm (in.)]



- Scale 0.75
- The spring rate is 1.36 N•m (12 lb•in) and the material is carbon steel/spring steel.
- Use M5 or #10-32 bolts to mount the sensor to the frame of the machine.

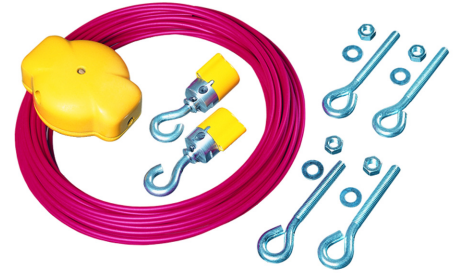
Figure 11 - Stainless-steel Housing [mm (in.)]



The spring rate is 1.36 N•m (12 lb•in) and the material is stainless steel 302.

Lifeline Rope Tensioner System

The Lifeline™ Rope Tensioner System (LRTS) is a unique cable (rope) tensioning system, which allows for quick installation of cable actuated systems. Other methods can be time consuming and awkward to fit.



Features

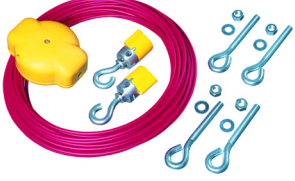





- Cable adjustment up to 300 mm (11.8 in.), 150 mm (5.9 in.) on either side of the tensioner
- Quick thread and grip of cable with cable grip
- Cable tidy incorporated into the cable grips
- Simple tensioning via the tensioner with a hex key
- You can install and commission in approximately 3 minutes.
- Easy installation, no specialty tools are required

The quick installation and universal use of the LRTS means you can also use the system for applications other than cable-actuated emergency stop systems.

Specifications

Attribute	Lifeline Rope Tensioner System
Material	<ul style="list-style-type: none">• Tensioner: Glass-filled nylon• Cable gripper: Acetal, zinc alloy, stainless steel• Cable gripper gears: Stainless steel• Cable: Cable to BS 302:1987, wire Ø4.0, steel core with polypropylene sheath• P-bolt: Stainless steel
Color	<ul style="list-style-type: none">• Tensioner: Yellow• Cable gripper: Yellow/natural• Cable: Red• P-bolt: Natural
Weight	<ul style="list-style-type: none">• Tensioner: 140 g (0.31 lb)• Cable gripper: 80 g (0.17 lb)
Operating temperature	-25...+80 °C (-13...+176 °F)
Cable O.D.	4 mm (0.15 in.)
Cable adjustment range, max	300 mm (11.8 in.)
Tensioner holding force, max	500 N (112.5 lbf)
Gripper holding force, Max	280 N (63.0 lbf)
Enclosure type rating	IP30
Tensioner adjustment tool	5 mm (0.20 in.) A/F hex key

Product Selection

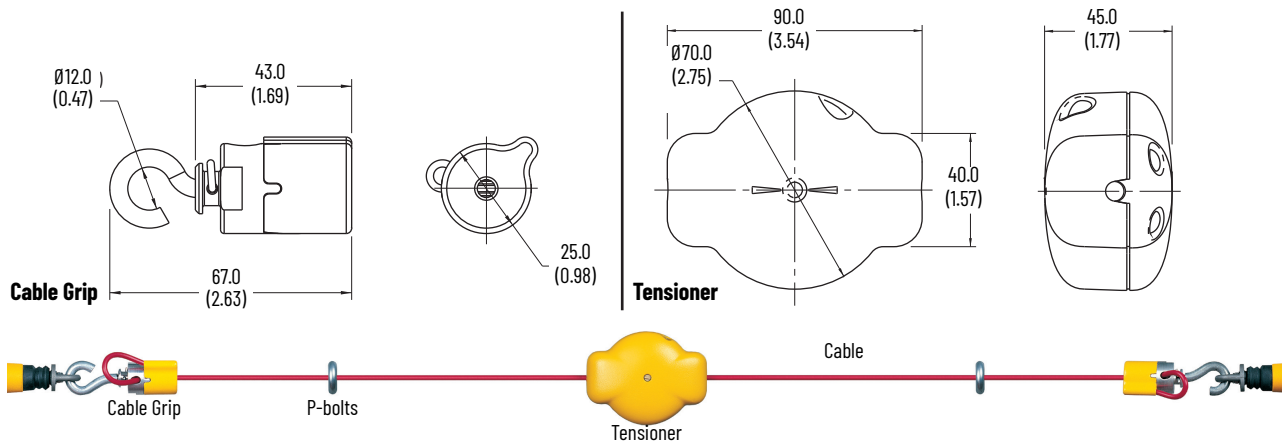
	Description		Cat. No.	
	Installation kit	5 m (16.4 ft)	3 eyebolts	440E-A13079
		10 m (32.8 ft)	6 eyebolts	440E-A13080
		15 m (49.2 ft)	8 eyebolts	440E-A13081
		20 m (65.6 ft)	10 eyebolts	440E-A13082
		30 m (98.4 ft)	14 eyebolts	440E-A13083
		50 m (164 ft)	22 eyebolts	440E-A13084
		75 m (246 ft)	32 eyebolts	440E-A13085
	Lifeline tensioner and hex key only		440E-A17105	
	Lifeline gripper	Two pack	440E-A17107	
		20 pack	440E-A17106	
	Lifeline tensioner, two grippers and hex key		440E-A17112	
	Two Lifeline tensioner, two grippers and hex key		440E-A17140	
 <p>Red Cable</p>	Polypropylene-covered steel cable	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	100 m (328 ft)	440E-A14739	
		300 m (984 ft)	440E-A14740	

A stainless-steel tensioner kit is available for use with the Lifeline 4 stainless steel cable pull switch, see [Lifeline 4 Stainless-steel Cable Pull Switches on page 24](#).

Approximate Dimensions

Dimensions are not for installation purposes.







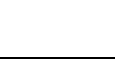










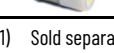
Figure 12 - Dimensions [mm (in.)]



Lifeline 3 and Lifeline 4 Cable Pull Switches











Description	Cat. No.
 Lifeline™ P-bolt M8 x 1.25 thread size, 60 mm (2.36 in.) threaded length, 12 mm (0.47 in.) diameter eye, 80 mm (3.15 in.) overall length, stainless steel	440E-A17191
 Lifeline eyebolt M8 x 1.25 thread size, 60 mm (2.36 in.) threaded length, 12 mm (0.47 in.) diameter eye, 75 mm (2.95 in.) overall length, mild steel	440E-A17003
 Lifeline tensioner spring 19 mm (0.75 in.) diameter, 210 mm (8.27 in.) overall length, 50 N (11.24 lbf) 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
 Adapter, conduit, M20 to 1/2 in. NPT, plastic	440A-A09042
 Screwdriver including security bit	440A-A09018

Lifeline 4 Cable Pull Switches



Description	Cat. No.
 Replacement cover for Lifeline 4 cable/ push button	440E-A13054
 Replacement cover for Lifeline 4 cable/ push button, no E-stop	440E-A17115
 Mounting bracket for Lifeline 4 cable/ push button	440E-A17130
 Indicator, M20 conduit pilot light – Amber lens T-3 1/4 insert Use T-3 1/4 bulb ⁽¹⁾	440A-A19001
 Indicator, 1/2 inch NPT conduit pilot light – Amber lens T-3 1/4 insert Use T-3 1/4 bulb ⁽¹⁾	440A-A19005
 Indicator, M20 conduit pilot light – Amber lens bayonet-style insert Use light-emitting diode (LED) bulb ⁽¹⁾	440A-A17124
 Indicator, 1/2 in. NPT conduit pilot light – Amber lens bayonet-style insert Use LED bulb ⁽¹⁾	440A-A17122
 Indicator, M20 conduit pilot light – Red lens T-3 1/4 insert Use T-3 1/4 bulb ⁽¹⁾	440A-A19002
 Indicator, 1/2 inch NPT conduit pilot light – Red lens T-3 1/4 insert Use T-3 1/4 bulb ⁽¹⁾	440A-A19007
 Indicator, M20 conduit pilot light – Red lens bayonet-style insert Use LED bulb ⁽¹⁾	440A-A17125
 Indicator, 1/2 in. NPT conduit pilot light – Red lens bayonet-style insert Use LED bulb ⁽¹⁾	440A-A17123
 Bulb, 24V for conduit pilot light 2.8 W T-3 1/4 bulb, miniature screw base	440A-A09056
 Bulb, 110V for conduit pilot light 2.6 W T-3 1/4 bulb, miniature screw base	440A-A09055
 Bulb, 240V for conduit pilot light 0.75 W T-3 1/4 bulb, miniature screw base	440A-A09054
 Red LED bulb, 24V AC/DC for conduit pilot light bayonet-style insert	800T-N419R
 White LED bulb, 24V AC/DC for conduit pilot light bayonet-style insert	800T-N419W
 Red LED Bulb, 120V AC for conduit pilot light bayonet-style insert	800T-N421R
 White LED Bulb, 120V AC for conduit pilot light bayonet-style insert	800T-N421W

(1) Sold separately

Lifeline 4 Stainless-steel Cable Pull Switches

Description			Cat. No.
 Polypropylene Covered Steel Cable	Stainless-steel installation kit – 5 m (16.4 ft)	4 eyebolts	440E-A13194
	Stainless-steel installation kit – 10 m (32.8 ft)	4 eyebolts	440E-A13195
	Stainless-steel installation kit – 15 m (49.2 ft)	7 eyebolts	440E-A13196
	Stainless-steel installation kit – 20 m (65.6 ft)	8 eyebolts	440E-A13197
	Stainless-steel installation kit – 30 m (98.4 ft)	12 eyebolts	440E-A13198
	Stainless-steel installation kit – 50 m (164 ft)	20 eyebolts	440E-A13199
	Stainless-steel installation kit – 75 m (246 ft)	30 eyebolts	440E-A13200
 UV Resistant Polypropylene-Covered Steel Cable	Stainless-steel installation kit – 5 m (16.4 ft)	4 eyebolts	440E-A13220
	Stainless-steel installation kit – 10 m (32.8 ft)	4 eyebolts	440E-A13221
	Stainless-steel installation kit – 15 m (49.2 ft)	7 eyebolts	440E-A13222
	Stainless-steel installation kit – 20 m (65.6 ft)	8 eyebolts	440E-A13223
	Stainless-steel installation kit – 30 m (98.4 ft)	12 eyebolts	440E-A13224
	Stainless-steel installation kit – 50 m (164 ft)	20 eyebolts	440E-A13225
	Stainless-steel installation kit – 75 m (246 ft)	30 eyebolts	440E-A13226
	Stainless-steel turn buckle kit (no cable)		440E-A13227
	Stainless-steel P-bolt, M8 x 1.25 thread size, 60 mm (2.36 in.) threaded length, 12 mm (0.47 in.) diameter eye, 80 mm (3.15 in.) overall length		440E-A17191
	Stainless-steel eyebolt, M8 x 1.25 thread size, 58 mm (2.28 in.) threaded length, 12 mm (0.47 in.) diameter eye, 75 mm (2.95 in.) overall length		440E-A13201
	Stainless steel 316 tensioner spring, 19 mm (0.75 in) diameter. 210 mm (8.27 in) overall length		440E-A13202
	Replacement cover		440E-A13203
	Replacement cover with no E-stop		440E-A13550
	Stainless steel 316 inside corner pulley		440E-A13205
	Stainless-steel outside corner pulley		440E-A13206

Lifeline 5 Cable Pull Switches

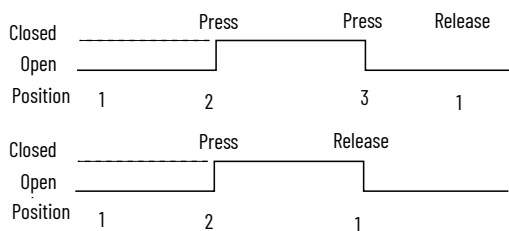
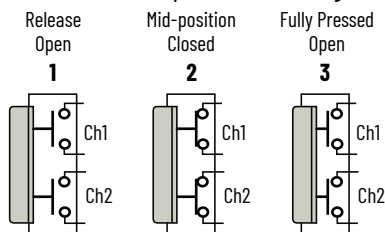
Description		Cat. No.
	Steel replacement spring	440E-ASPRING
	Stainless-steel replacement spring	440E-ASPRING-SS

An enabling switch is a manually operated control device that is used with a start control. The safety function of the enabling switch has two parts:

- Continuous actuation of the enabling device allows machine operation.
- When not actuated, the enabling device initiates a stop command to restrict machine operation.

Historically, many enabling switches used a two-position switch. If an unexpected incident occurs, the two-position switch opens when the muscles relax. The three-position switch provides enhanced performance as it opens when the muscles either relax or contract. Machine safeguarding trends towards the use of three-position switches. Various types of devices use the three-position switch as enabling switches, such as push buttons, grip switches, and foot switches.

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



Enabling switches are typically used in cases when you require access to the hazardous portion of the machine while the machine is running. Tasks where you can use an enabling switch include visual observations, minor adjustments, troubleshooting, calibration, tool changes, and lubrication. Typically, you must place the machine in a reduced performance role before you access the machine. Perform a risk assessment to determine the level of reduced performance. If an unexpected event occurs, you can release or squeeze the actuator of the enabling switch to deactivate the machine to avoid injury.

The 440J enabling switches come in three models:

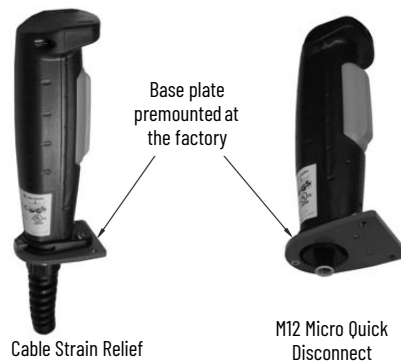
- Standard switch with no additional buttons
- Switch with an additional single normally open (N.O.) contact
- Switch with an additional dual-channel E-stop button

Typical use for the N.O. contact model is 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 midposition.

Mounting Considerations

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

Figure 13 - 440J Enabling Switch with Base Plate



Some applications only require the operation of the switch contacts. In this case, the Cat. No. 440J-A00N mounting bracket is used.

Figure 14 - 440J Enabling Switch with Mounting Bracket



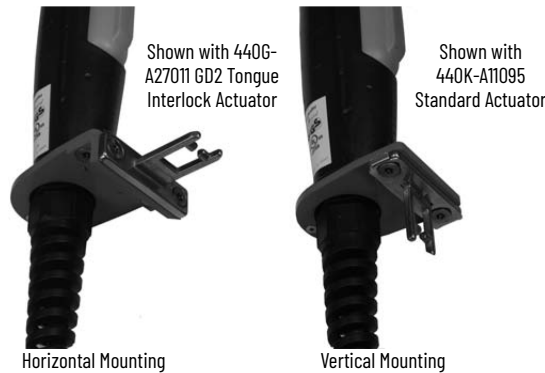
Add additional accessory brackets to achieve various arrangements. The Cat. No. 440J-A01N right-angle bracket accommodates the Cat. No. 440K-A11238 standard actuator (for use with the standard Trojan™ 6 or Trojan T15 tongue interlock) and the GD2 Cat. No. 440G-A27011 actuator (for use with the GD2 tongue interlocks).

Figure 15 - 440J-A01N Bracket



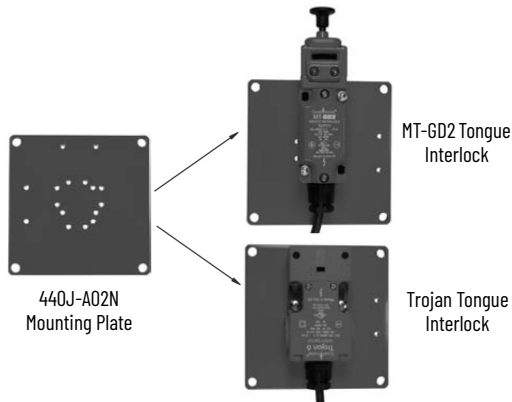
With two additional screws, you can mount the right angle bracket to the 440J enabling switch for horizontal mounting. You can mount an actuator for vertical use without the Cat. No. 440J-A01N bracket.

Figure 16 - Horizontal and Vertical Mounting



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

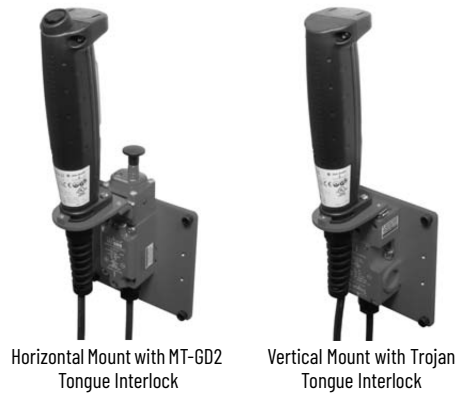
Figure 17 - Mounting Plate



For horizontal actuator mounting, use the MT-GD2 tongue interlock with the manual latch release. Only use the Trojan tongue interlock for vertical mounting. To use the 440K-T (Trojan 6 or T15 tongue interlocks), rotate the head 180°. You cannot use Trojan GD2 tongue interlock models with the Cat. No. 440J-A02N mounting plate as you cannot rotate the head.

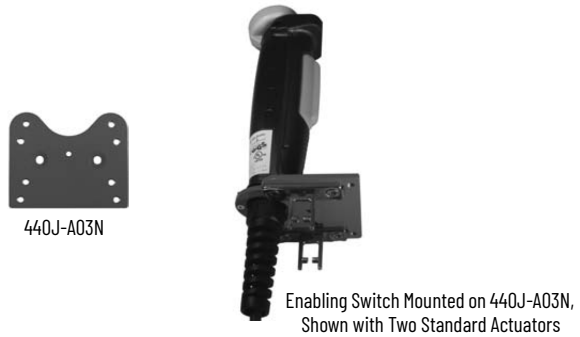
For single-switch mounting, we recommend you use the 440K-MT (MT-GD2) tongue interlock with the latch release. The latch holds the contacts closed when the enabling switch is bumped or rattled. Alternatively, use the 440K-T (Trojan 6 or T15 tongue interlocks) with a vertical mounting. The holding force of these interlock switches is enough to keep the contacts closed under minor bumps and rattles.

Figure 18 - Single-switch Mounting



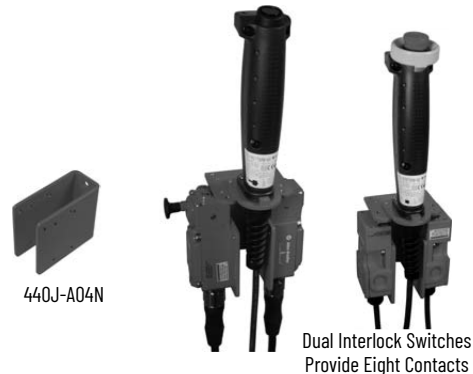
In some applications, you need additional contacts when you use the enabling switch. Two additional accessories are available to allow the enabling switch to interact with two interlocks.

The 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 tongue interlock actuators. Use this arrangement with the Cat. No. 440K-A04N accessory.



The U-shaped Cat. No. 440J-A04N plate can accommodate two tongue interlocks: Either 440K-MT or 440K-T. When you use the Cat. No. 440J-A03N plate with dual actuators, a total of eight contacts (four in each switch) are available for the safety and control system.

Application Considerations



The enabling device by itself is simply a set of contacts, however, the application of the enabling device into a machine safeguarding system can be complicated.

Consideration the following:

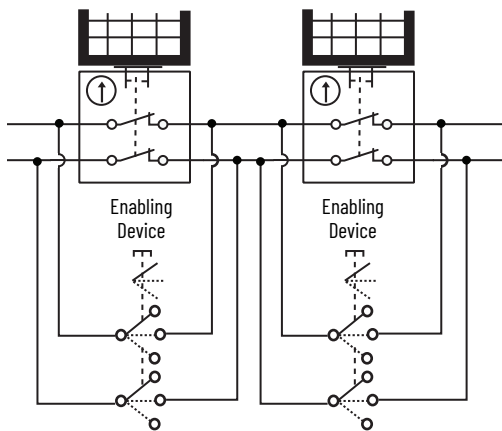
- Set the machine in a reduced performance mode.
In some cases, the speed or other characteristic of the machine must reduce so you can release or squeeze the trigger switch to avoid the hazard. Design the control system so that the machine does not change back to normal performance during the enabling task. A key-operated mode selector switch is one method of setting the machine in a reduced performance mode. Select Reduced mode, remove the key from the switch, and take the key with you. Hold the trigger switch to allow the hazard to operate in a reduced mode.
- Reduced Performance mode status.

You can use sensors to confirm the reduced performance of the machine. Position sensors, encoders, or other devices that an appropriated logic device monitors, provide feedback to the control system. If the performance (for example, operating speed) increases beyond a predetermined limit, the control system executes a stop command. You can also release the enabling device to execute a stop command.

- Type of access.

The safety system architecture differs depending on whether you require partial body or full body access.

For partial body access, the enabling device must continuously bypass the primary safeguard (for example, gate interlock, safety light curtain, safety mat, or safety scanner). Enabling devices must only bypass one primary safeguard. Avoid the bypass of multiple safeguards with one enabling device, as it is possible that the other bypassed safeguards do not detect access to the hazard.



For full body access, consider 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 hazardous area are detected. If the primary safeguard must remain inactive, administrative procedures must confirm that additional personnel do not enter the hazardous area.

- Multiple personnel access.

When multiple personnel must access the hazard, each person must use their own enabling device. All enabling devices must be active to energize the hazard.

Figure 19 - Multiple Personnel Access

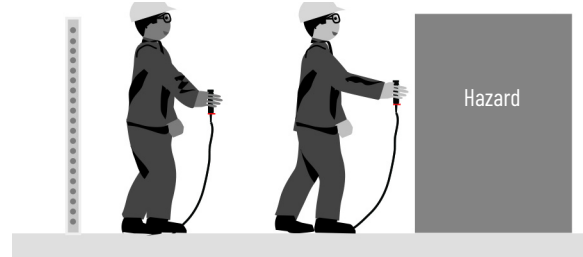


Table 10 summarizes the use of additional interlocking devices with the enabling device. For partial body access, three cases exist, depending on the type of device you bypassed and the logic unit the safety system uses.

- The enabling switch can connect directly across the safeguarding device that has dry contacts.
- Devices with OSSD outputs, like GuardShield™ safety light curtains need one interlock with four contacts to avoid nuisance faults when you use a monitoring safety relay as the safety system logic device.
- When you use a safety PLC as the logic device, the enabling device can connect to separate inputs and you can use internal programming logic to bypass the safety light curtain when the enabling switch is needed.

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

- When you use a safety PLC, an interlock with four contacts is required. The four contacts are used to interlock the safety system reset function and the machine start function.
- When you use a monitoring safety relay, two interlocks with four contacts each are required. 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 help prevent the start of the machine from the control panel.

Table 10 - Interlock Requirements

Access Type	Safeguard Type	Logic Device	Interlocks Required
Partial body	Dry contact interlocks (for example, Elf™, Cadet™, Trojan, MT-GD2, Sipa™, Ferrogard™, 440G-MT, TLS-GD2, Atlas™)	Monitoring safety relay or safety PLC	None
	Devices with OSSD outputs (for example, GuardShield light curtain, SensaGuard™, SafeZone™ Multizone)	Safety PLC	Single interlock with four contacts
Full body	All types	Monitoring safety relay	
		Safety PLC	Dual interlocks, each with four contacts

Notes:

440J Enabling Switch

You can use the 440J Enabling Switch as part of the required conditions to allow safe working inside a machine guard. These enabling switches are lightweight and ergonomically designed for easy use. The standard model includes two independent three-position switches that actuate by squeezing the trigger. Additional models are available with an optional jog button or dual-channel E-stop button.



Features

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

Specifications

Table 11 - General Specifications

Attribute		440J Enabling Switch					
Applicable standards		IEC 60947-5-1, EN 60947-5-1, GS-ET-22, JIS C 8201-5-1, UL 508, CSA C22.2 No. 14, IEC 60947-5-8, EN 60947-5-8, GB/T14048.5					
Standards for use		ISO 12100/EN ISO 12100, IEC 60204-1/ EN 60204-1, ISO 11161/EN ISO 11161, ISO 10218-1/EN ISO 10218-1, ANSI/RIA/ISO 10218-1, ANSI/RIA R15.06, ANSI B11.19, ISO 13849-1/EN ISO 13849-1					
Certifications		CE Marked for all applicable directives, UKCA Marked for all applicable regulations, cULus Listed, TÜV Certified					
Contact configuration 3-position switch		Two contacts					
Auxiliary contacts		1 N.C.					
E-stop contacts		2 N.C.					
Push-button contact		1 N.O.					
Rated operational voltage (Ue)		30V	125V	250V			
Rated operating current (Ie)	3-position switch	440J-N21TNPM, 440J-N21TNPM-NP, 440J-N2NTNPM-NE	AC	Resistive load (AC-12)	–	1 A	0.5 A
				Inductive load (AC-15)	–	0.7 A	0.5 A
		DC	Resistive load (DC-12)	1 A	0.2 A	–	
			Inductive load (DC-13)	0.7 A	0.1 A	–	
	Auxiliary switch	440J-N21TNPM, 440J-N21TNPM-NP	AC	Resistive load (AC-12)	–	2.5 A	1.5 A
				Inductive load (AC-15)	–	1.5 A	0.75 A
			DC	Resistive load (DC-12)	2.5 A	1.1 A	0.55 A
				Inductive load (DC-13)	2.3 A	0.55 A	0.27 A
	E-stop switch	440J-N2NTNPM-NE	AC	Resistive load (AC-12)	–	2.5 A	2.5 A
				Inductive load (AC-15)	–	2.5 A	1.5 A
			DC	Resistive load (DC-12)	2 A	0.44 A	0.2 A
				Inductive load (DC-13)	1 A	0.22 A	0.1 A
	Push-button switch	440J-N21TNPM-NP	AC	Resistive load (AC-12)	–	0.5 A	–
				Inductive load (AC-15)	–	0.3 A	–
			DC	Resistive load (DC-12)	1 A	0.2 A	–
				Inductive load (DC-13)	0.7 A	0.1 A	–
Minimum current		3V, 5 mA AC/DC					
Short-circuit protection device		250V, 10 A fuse (IEC 60127-1)					
Thermal current (I _{th})		2.5 A					
Rated insulation voltage (Ui)		250V (push-button switch: 125V)					
Rated impulse withstand voltage (U _{imp})		2500V (except push-button switch)					
Pollution degree		3					
Operating force (dependent on the ambient temperature)		<ul style="list-style-type: none"> • Position 2: 15 N approximate • Position 3: 50 N maximum 					
Actuation frequency, max		1200 operations per hour					
Protection		<ul style="list-style-type: none"> • IP66: 440J-N21TNPM • IP65: 440J-N21TNPM-NP, 440J-N2NTNPM-NE 					
Conduit entry		1 x M20 (enclosed within the switch)					
Applicable cable diameter		7...13 mm (0.27...0.51 in.)					
Insulation resistance, min		100 M Ω					

Table 11 - General Specifications (Continued)

Attribute	440J Enabling Switch
Contact resistance, max	100 Ω
Temperature rise - contact, max	30 °C (86 °F)
Temperature rise - terminal, max	30 °C (86 °F)
Actuator strength, min	500 N
Weight	<ul style="list-style-type: none"> • 440J-N21TNPM: 195 g (0.43 lb) • 440J-N21TNPM-NP: 205 g (0.45 lb) • 440J-N2NTNPM-NE: 210 g (0.46 lb)
Color	Black/gray
Case material of switch body	PA66
Rubber boot material	NBR/PVC
Operating temperature	-10...+60 °C (14...140 °F)
Mechanical life - enabling switch	<ul style="list-style-type: none"> • Position 1 - 2 - 1: 1,000,000 operations • Position 1 - 2 - 3 - 1: 100,000 operations
Electrical life	<ul style="list-style-type: none"> • Enabling switch: 100,000 operations • Emergency stop: 100,000 operations • Push button: 100,000 operations

Product Selection

IMPORTANT Base plate included with all switches.

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 E-stop button	440J-N2NTNPM-NE

Connection Systems







Description	Cat. No.		
	4-pin Micro (M12) Quick Disconnect	5-pin Micro (M12) Quick Disconnect ⁽¹⁾	8-pin Micro (M12) Quick Disconnect
Cordset	889D-F4AC-x ⁽²⁾	889D-F5AC-x	889D-F8AB-x
Patchcord	889D-F4ACDM-y ⁽³⁾	889D-F5ACDM-y	889D-F8ABDM-y

(1) To connect to ArmorBlock® Guard I/O™ modules.

(2) Replace the x with 2 (2 m [6.6 ft]), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) for standard cable lengths.

(3) Replace the y with 1 (1 m [3.3 ft]), 2 (2 m [6.6 ft]), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) for standard cable lengths.

Accessories

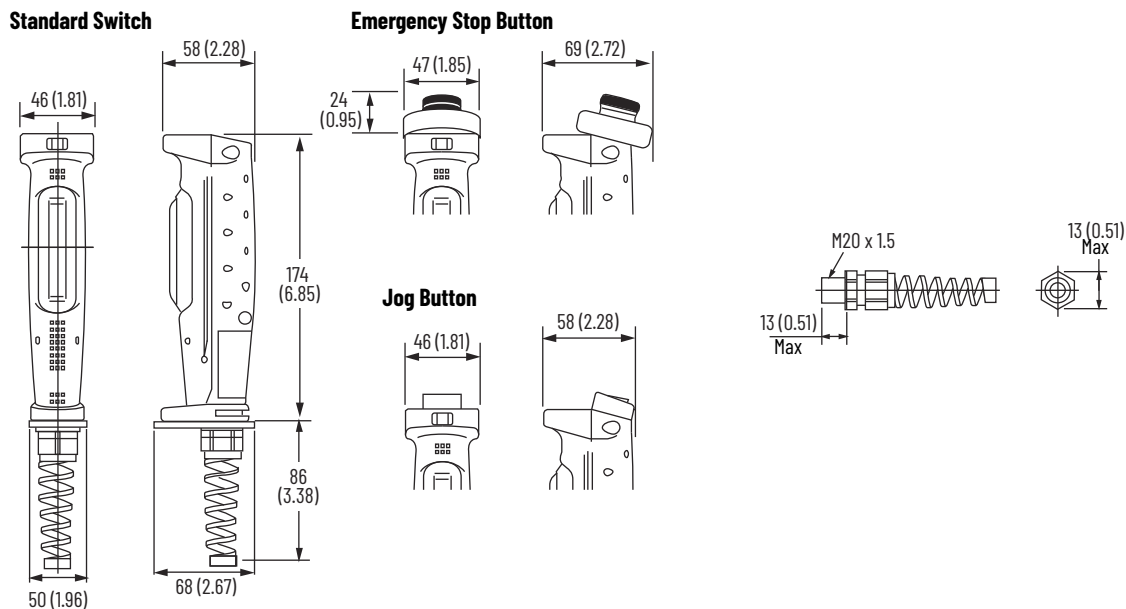
	Description	Cat. No.
	Mounting bracket suitable for a single enabling switch.	440J-A00N ⁽¹⁾
	Mounting bracket suitable for one actuator that mounts onto the switch. Includes four flat head screws and one resistor x bit.	440J-A01N ⁽¹⁾
	Mounting bracket suitable for a single enabling switch and a single safety switch.	440J-A02N ⁽¹⁾
	Mounting bracket suitable for two actuators mounted onto switch. Includes six flat head screws and one resistor x bit.	440J-A03N ⁽¹⁾
	Mounting bracket suitable for a single enabling switch and two safety switches.	440J-A04N ⁽¹⁾
	NBR/PVC (silicone free) rubber boot kit.	440J-A10N

(1) The bracket has predrilled holes suitable for mounting either the MT-GD2, Trojan 5, or Trojan 6 tongue interlock. The enabling switch, safety switch, and actuator are not supplied with the mounting bracket and are available separately.

Approximate Dimensions

Dimensions are not for installation purposes.

Figure 20 - Enabling Switches [mm (in.)]



Mounting Brackets

A range of brackets are available to mount the enabling switch alone, or with one or two safety switches. A small bracket is fitted to the enabling switch onto which the actuator bracket mounts. Application technique publications are available at rok.auto/literature for information on the use of the enabling switch with a safety switch.

Figure 21 - Enabling Switch Mounting Bracket (Cat. No. 440J-A00N) [mm (in.)]

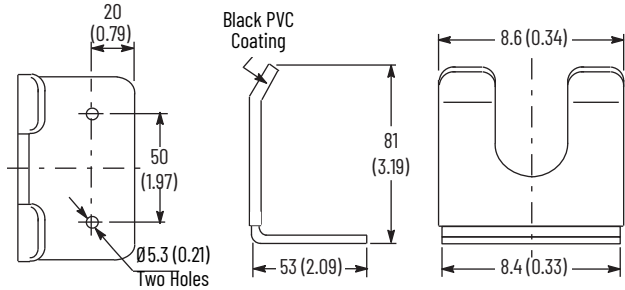


Figure 24 - Double Actuator Plate (Cat. No. 440J-A03N) [mm (in.)]

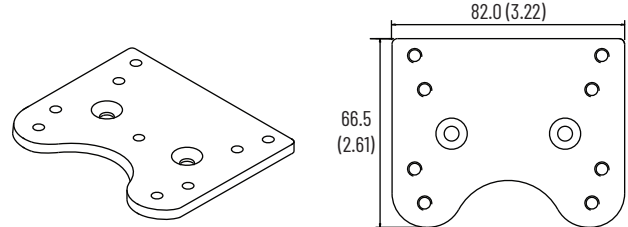


Figure 22 - Single Actuator Bracket (Cat. No. 440J-A01N) [mm (in.)]

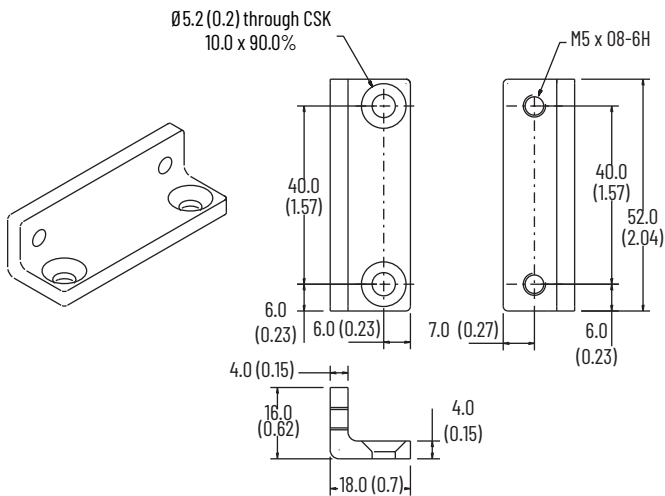


Figure 25 - Double Safety Switch Bracket (Cat. No. 440J-A04N) [mm (in.)]

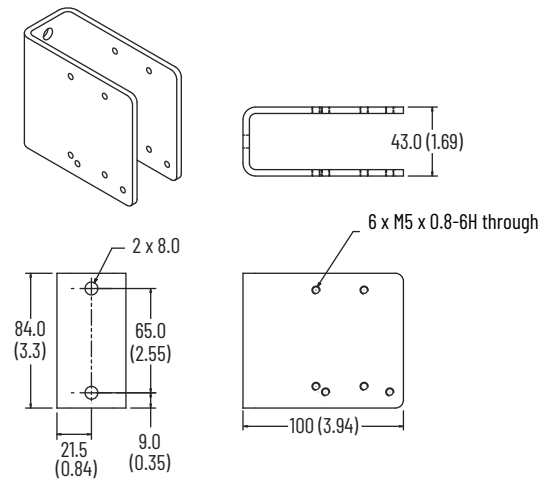
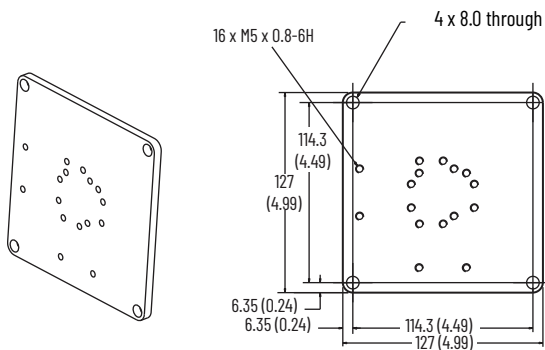


Figure 23 - Single Safety Switch Plate (Cat. No. 440J-A02N) [mm (in.)]



Typical Wiring Diagram

	Standard		With Jog Button		With E-stop Button			
Contact operation □ Contact Open ■ Contact Closed								
Cable termination								
Quick disconnect termination								
Mating cordsets	889D-F4AC-x		889D-F5AC-x		889D-F8AB-x		889D-F8AB-x	
	1 Brown 2 White	Safety A	1 Brown 2 White	Safety A	1 White 2 Brown	Safety A	1 White 2 Brown	Safety A
	—	—	3 Blue	—	3 Green 4 Yellow	Safety B	3 Green 4 Yellow	Safety B
	3 Blue 4 Black	Safety B	4 Black 5 Gray	Safety B	5 Gray 6 Pink	Aux	5 Gray 6 Pink	E-stop A
				7 Blue 8 Red	Jog	7 Blue 8 Red	E-stop B	

Notes:

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation. You can view or download publications at rok.auto/literature.

Resource	Description
Cordsets and Field Attachables Technical Data, publication 889-TD002	Provides an overview of cordsets and field attachables that Rockwell Automation provides.
Lifeline 5 Cable-pull Safety Switch Installation Instructions, publication 440E-IN008	Provides general guidelines for installing the Lifeline™ 5 cable-pull safety switch.
Lifeline 4 Cable-pull Safety Switch, publication 440E-IN006	Provides general guidelines for installing the Lifeline 4 cable-pull safety switch.
Dual Lifeline 4 Installation Instructions, publication 440E-IN002	Provides general guidelines for installing dual Lifeline 4 cable-pull safety switches.
EtherNet/IP Network Devices User Manual, publication ENET-UM006	Describes how to configure and use EtherNet/IP™ devices to communicate on the EtherNet/IP network.
Ethernet Reference Manual, publication ENET-RM002	Describes basic Ethernet concepts, infrastructure components, and infrastructure features.
System Security Design Guidelines Reference Manual, publication SECURE-RM001	Provides guidance on how to conduct security assessments, implement Rockwell Automation® products in a secure system, harden the control system, manage user access, and dispose of equipment.
UL Standards Listing for Industrial Control Products, publication CMPNTS-SR002	Assists the original equipment manufacturers (OEMs) with the construction of panels so they conform to the requirements of Underwriters Laboratories.
American Standards, Configurations, and Ratings: Introduction to Motor Circuit Design, publication IC-AT001	Provides an overview of American motor circuit design, based on methods that are outlined in the NEC.
Industrial Components Preventive Maintenance, Enclosures, and Contact Ratings Specifications, publication IC-TD002	Provides a quick reference tool for Allen-Bradley® industrial automation controls and assemblies.
Safety Guidelines for the Application, Installation, and Maintenance of Solid-state Control, publication SGI-1.1	Designed to harmonize with NEMA Standards Publication No. ICS 1.1-1987 and provides general guidelines for the application, installation, and maintenance of solid-state control in the form of individual devices or packaged assemblies incorporating solid-state components.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, rok.auto/certifications	Provides declarations of conformity, certificates, and other certification details.

Rockwell Automation Support

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Technical Support Center	Find help with how-to videos, FAQs, chat, user forums, and product notification updates.	rok.auto/support
Knowledgebase	Access Knowledgebase articles.	rok.auto/knowledgebase
Local Technical Support Phone Numbers	Locate the telephone number for your country.	rok.auto/phonesupport
Literature Library	Find installation instructions, manuals, brochures, and technical data publications.	rok.auto/literature
Product Compatibility and Download Center (PCDC)	Download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes.	rok.auto/pcdc

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