



Emergency Stop Devices

Bulletins 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.

Topic	Page
Corrected catalog number in Lifeline 5 Electronic Monitored E-stop section to 440E-LL5SNE5	11 and 12

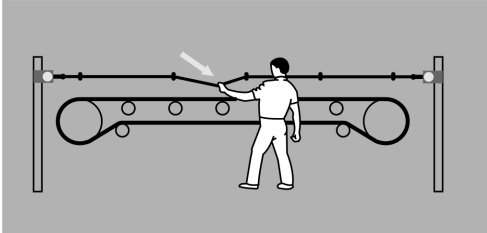
Additional Resources

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.

As shown in the following image, a Lifeline™ cable-pull device is a convenient and effective emergency stop device along the hazardous area. 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.

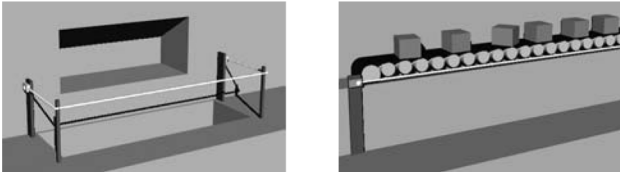
Figure 1 - Cable-pull Device



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.

Figure 2 - Typical Applications



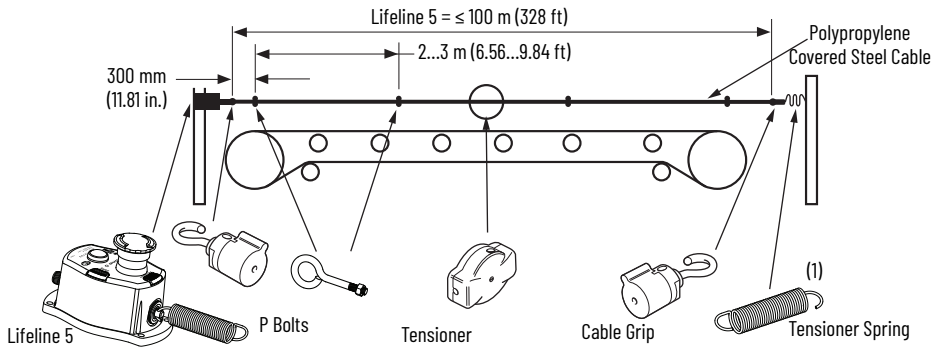
Mounting Specifications

- 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 (6.6...9.8 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.
- 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.

Typical Mounting Examples

Lifeline 5 Cable-pull Switches

Figure 3 - Mount One Switch with the Lifeline Rope Tensioner System (LRTS)



(1) For this installation example, use catalog number 440E-ASPRING for the standard model and catalog number 440E-ASPRINGSS for the stainless-steel model.

Figure 4 - Mount Two Switches with the LRTS

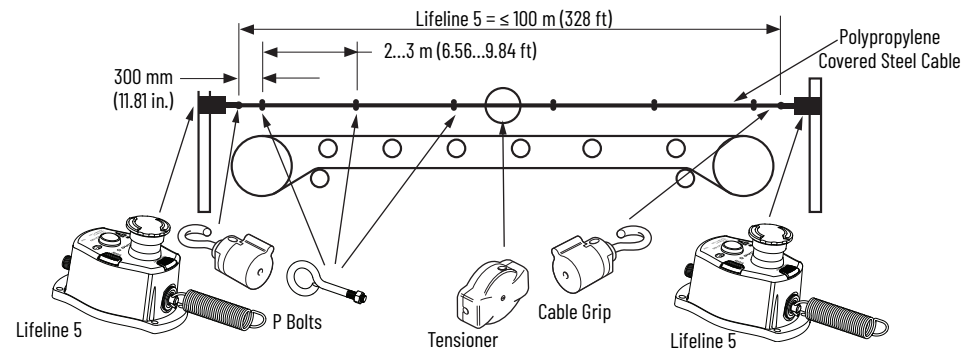
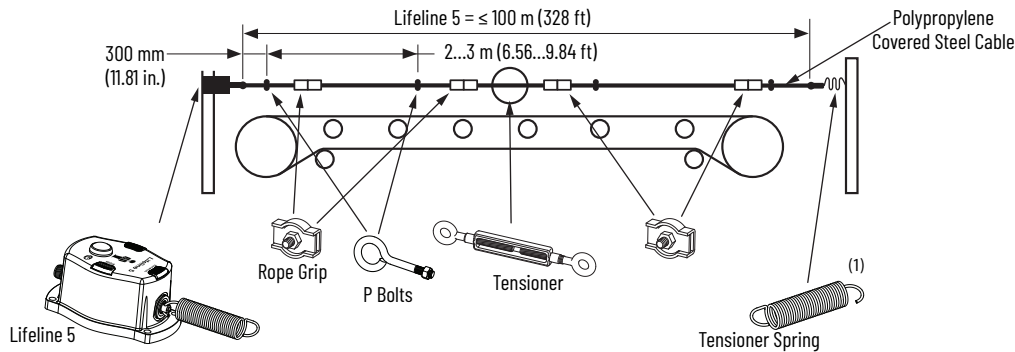
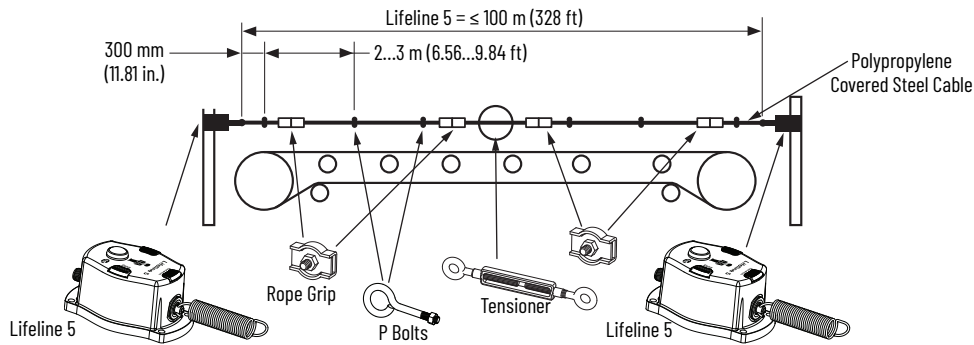
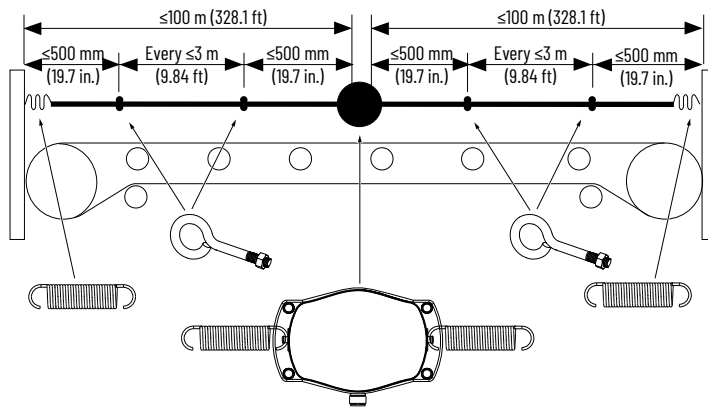


Figure 5 - Mount One Switch with the Stainless-steel Installation Kit



(1) For this installation example, use catalog number 440E-ASPRING for the standard model and catalog number 440E-ASPRINGSS for the stainless-steel model.

Figure 6 - Mount Two Switches with the Stainless-steel Installation Kit**Figure 7 - Dual-head Installation**

A secondary spring can be used when it is likely that actuation is attempted by pulling the wire along its axis. When you pull the wire in either direction, it generates the emergency stop command.

The choice between two switches or one switch is a matter of a risk assessment while considering the probability of a trapped rope along the span.

Lifeline 3 and Lifeline 4

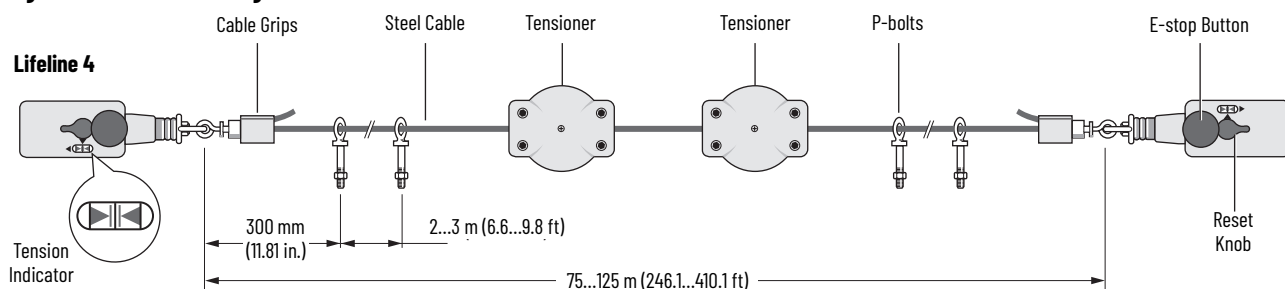
Figure 8 - Extended Length Models

Figure 9 - Standard Cable Length Models

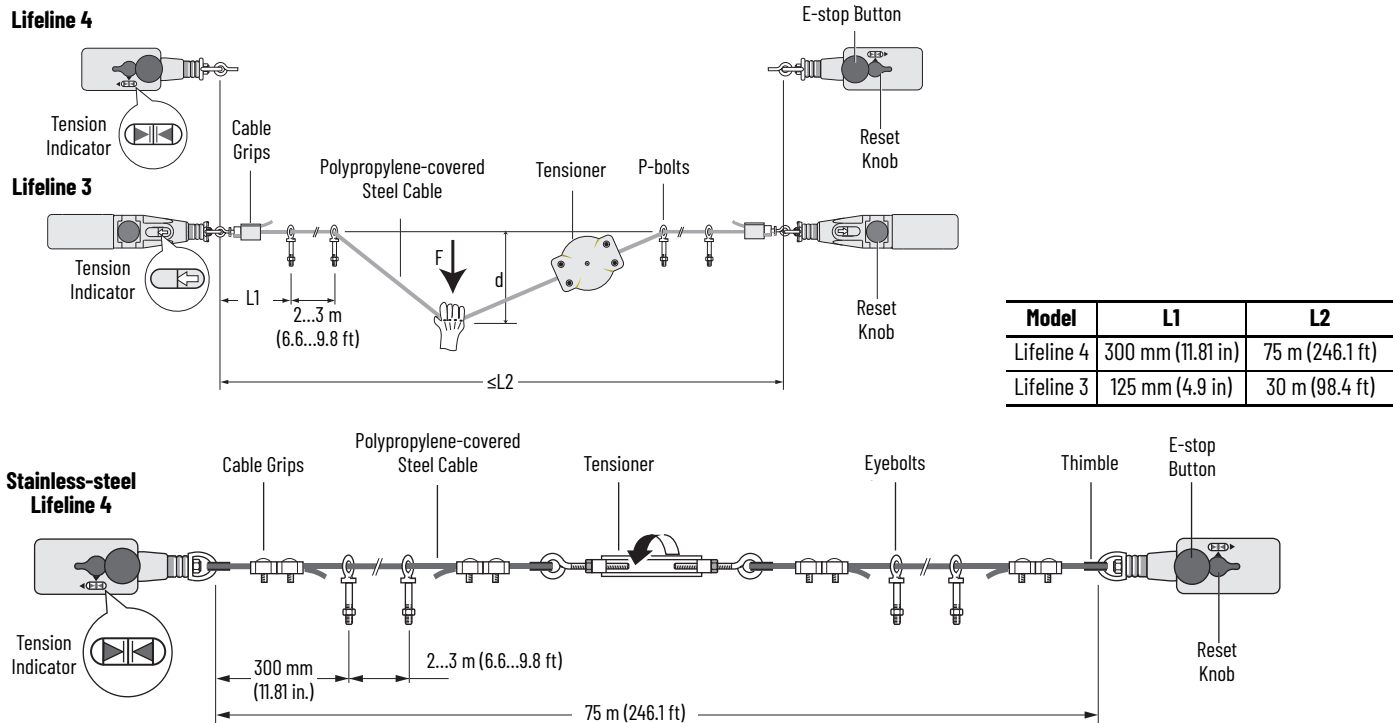
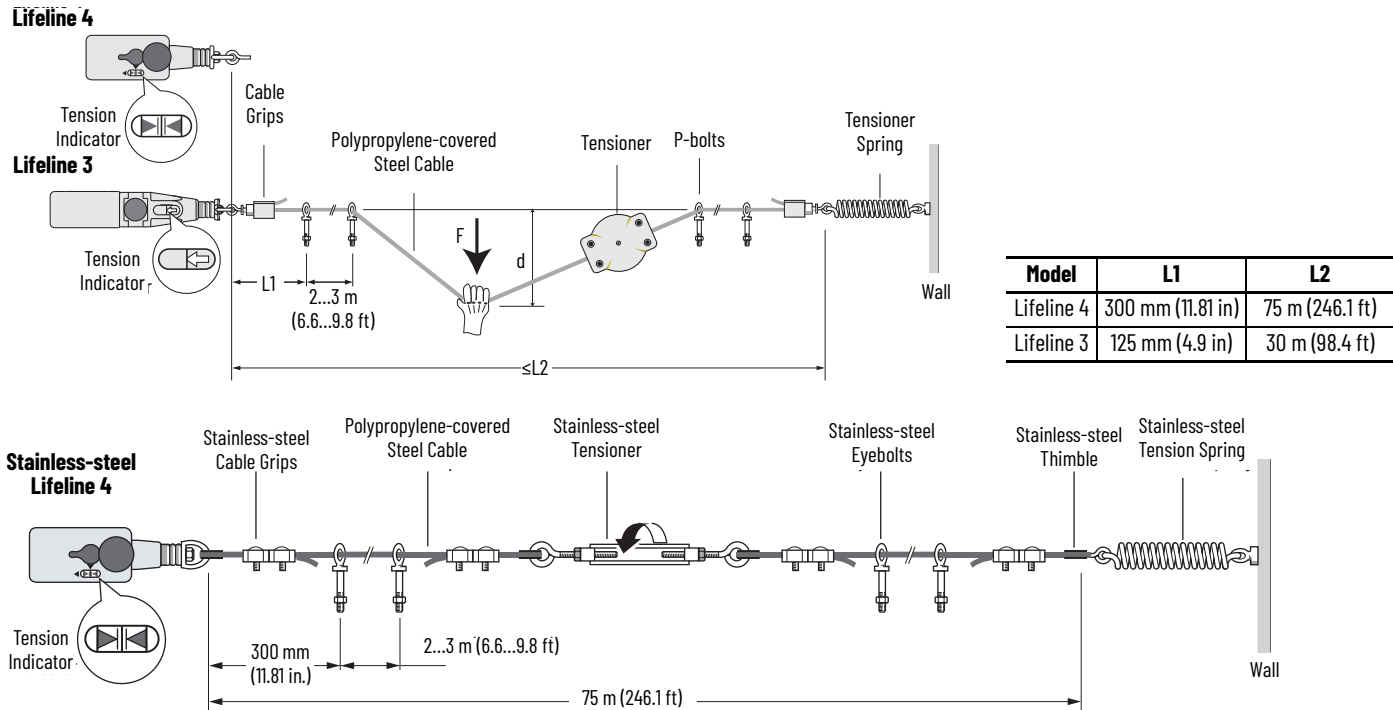


Figure 10 - Spring Tensioner



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 solid-state Lifeline 5 cable-pull switch is offered in stainless-steel or die-cast aluminum 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 200 m (656.2 ft) span (model-dependent) with the ability to stop a machine hazard through a simple pull of the attached cable.



Lifeline 5 cable switch 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 provide switch status and diagnostics during operation.

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

The Lifeline 5 cable pull switch is now enhanced with GuardLink® technology, our intelligent safety communication protocol. This upgrade brings powerful diagnostics and streamlines your wiring to your safety system.

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 61508
- Rugged stainless-steel (IP66, IP67, IP69) or die-cast aluminum (IP66) housings with an optional E-stop button
- Supports long cable spans up to 200 m (656.2 ft)
- Wide operating temperature range:
 - Aluminum housing: -20...+75 °C (-4...+167 °F)
 - Stainless-steel housing: -40...+75 °C (-40...+167 °F) for M12 5-pin connection and -20...+75 °C (-4...+167 °F) for M12 8-pin connection
- 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
- Auto-detect between OSSD and GuardLink mode

Specifications



All specifications apply to both single-head and dual-head models unless noted.

Attribute	Standard Aluminum Housing with E-stop	Standard Aluminum Housing without E-stop	Stainless-steel Housing without E-stop
Safety Ratings			
Standards Safety classification	PLe Cat 4 according to EN ISO 13849-1, SIL CL 3 per IEC 61508. Suitable for use in IEC 60621 applications. The intent of the operational functionality that EN ISO 13850 and IEC 60947-5-5 require is achieved by using electronic technology.		
Functional safety data	PFHd = 1.45E-9 (average frequency of a dangerous failure per hour) T1 = 20 (Proof test interval)		
Certifications	CE Marked for all applicable directives, UKCA marked for all applicable regulations, cULus Listed (UL 508), CCC Marked, and TÜV Certified.		
Operating Characteristics			
Cable span	- Single-head: 100 m (328.1 ft) - Dual-head: 200 m (656.2 ft)		
Tension force to run position	135 N (30.35 lbf)		
Tension force to lock out	195 N (43.84 lb)		
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 (OSSD mode only)		
Utilization category according to U _e /I _e	DC-12 and DC-13 24V 200 mA		
Frequency of operating cycle	0.25 Hz		
Off-state output current	< 0.5 mA		
Outputs (OSSD Mode Only)			
Safe state	De-energized (2 x PNP, 0V), AUX energized (1 x PNP, 24V)		
Run state	Energized (2 x PNP, 24V), AUX de-energized (1 x PNP, 0V)		
Tension	Energized (1 x PNP, 24V) (M12 8-pin only)		
No-load supply current	< 50 mA		
Load current	200 mA maximum		
Voltage drop	< 2V		
Mechanical			
Housing material	Aluminum		304 stainless steel
Environmental			
Operating temperature	-20...+75 °C (-4...+167 °F)		- M12 5-pin: -40...+75 °C (-40...+167 °F) - M12 8-pin: -20...+75 °C (-4...+167 °F)
Operating humidity	5...95% relative		
Washdown rating	IP66	IP66	IP66, IP67, IP69
Shock and vibration	IEC 60068-2-27: 30 g (1.05 oz), 11 ms IEC 60068-2-6: 10...500 Hz		
Pollution degree	IEC 60947-1: 3		
Attribute	Single Head (440E-LL5SS8, 440E-LL5SS5, 440E-LL5SE8, 440E-LL5SE5, 440E-LL5SN8, 440E-LL5SN5), Dual Head (440E-LL5DSE5, 440E-LL5DSN5, 440E-LL5DSS5)		
Electromagnetic Compatibility (EMC) ⁽¹⁾			
Electrostatic discharge (ESD)	IEC 61000-4-2: Air discharge		
	IEC 61000-4-2: Contact discharge		
Radiated EMF immunity	IEC 61000-4-3		
Electrical fast transient/burst immunity	IEC 61000-4-4		
Conducted immunity	IEC 61000-4-6		
Rated impulse withstand voltage	IEC 60947-1: 1 kV		
Protection	Short circuit, overload, reverse polarity, overvoltage, loss of ground		

(1) EMC requirements were tested to safety levels per IEC 61326-3-1.

Product Selection

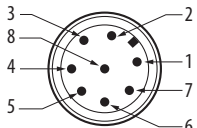
Description	Cat. No. ⁽¹⁾	Outputs ⁽²⁾	Connection	Connection Cable ⁽³⁾
Single-head Lifeline 5 with E-stop	440E-LL5SE5	2 OSSD outputs, 1 aux output	5-pin micro (M12)	889D-F5AC-2
	440E-LL5SE8	2 OSSD inputs, 2 OSSD outputs, 1 aux output, 1 tension output	5-pin micro (M12) connects to ArmorBlock® Guard I/O™ modules 8-pin micro (M12)	889D-F4ACDM-2 889D-F8AB-2
Single-head Lifeline 5 without E-stop	440E-LL5SN5	2 OSSD outputs, 1 aux output	5-pin micro (M12)	889D-F5AC-2
	440E-LL5SN8	2 OSSD inputs, 2 OSSD outputs, 1 aux output, 1 tension output	5-pin micro (M12) connects to ArmorBlock Guard I/O modules 8-pin micro (M12)	889D-F4ACDM-2 889D-F8AB-2
Single-head Lifeline 5 stainless steel without E-stop	440E-LL5SS5	2 OSSD outputs, 1 aux output	5-pin micro (M12)	889DS-F5AC-2
	440E-LL5SS8	2 OSSD inputs, 2 OSSD outputs, 1 aux output, 1 tension output	5-pin micro (M12) connects to ArmorBlock Guard I/O modules 8-pin micro (M12)	889D-F4ACDM-2 889DS-F8AB-2
Dual-head Lifeline 5 with E-stop	440E-LL5DSE5	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
Dual-head Lifeline 5 without E-stop	440E-LL5DSN5	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
Dual-head Lifeline 5 stainless steel without E-stop	440E-LL5DSS5	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

(1) Tension spring included.

(2) All M12 5-pin devices: Autodetects between OSSD and GuardLink mode.

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

Table 1 - 8-pin Connection (OSSD Only) ⁽¹⁾

	Pin	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

(1) Not available for dual-head switches.

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

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

Table 2 - 5-pin Connection

	Pin	Color	Function	
			OSSD Mode	GuardLink Mode
	1	Brown	+24V DC	+24V DC
	2	White	Safety OSSD 1 Output	Safety Out
	3	Blue	0V	Ground 0V
	4	Black	Safety OSSD 2 Output	Safety In
	5	Gray	Auxiliary Output	CLU

Description	Temperature Rating	Jacket Material	Coupling Nut	Cat. No.
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

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

IMPORTANT

If you do not require the auxiliary signal, a 4-pin cordset (Cat. No. 889D-F4AC-2) can be used. This cordset cannot be used in GuardLink applications.

For low temperature applications, use a 4-pin cordset (Cat. No. 889DS-F4HJ-2).

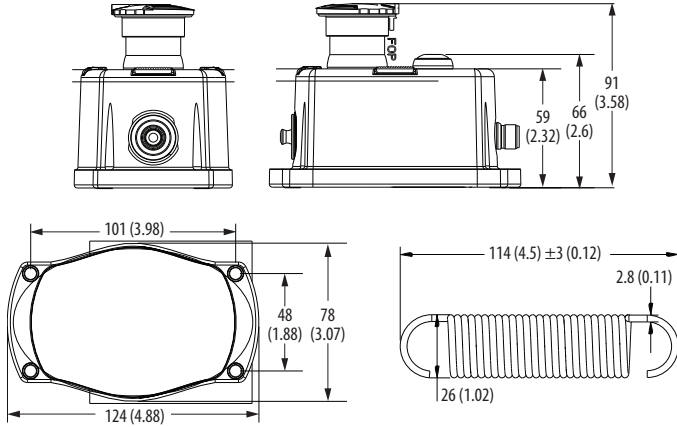
The recommended patchcord for use with ArmorBlock Guard I/O is 2 m (6.5 ft) - 889D-F4ACDM-2. Replace the 2 with OM3 (0.3 m [0.98 ft]), 1 (1 m [3.28 ft]), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) for standard cable lengths.

Approximate Dimensions

Single-head Switches

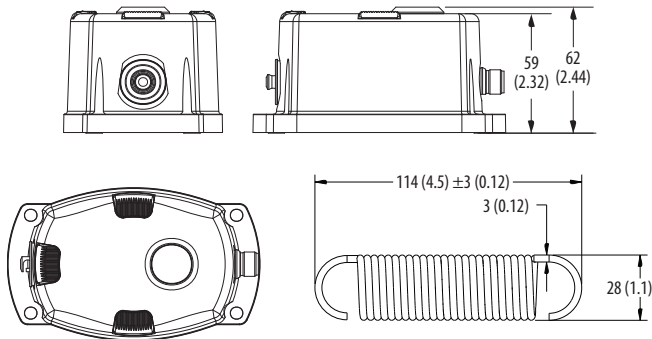
For the standard housing, the spring rate is 2.1 N/mm (12 lbf/in.) and the spring material is carbon steel/spring steel.

Figure 11 - Standard Housing [mm (in.)]



For the stainless-steel housing, the spring rate is 2.1 N/mm (12 lbf/in.) and the spring material is 302 stainless steel.

Figure 12 - Stainless-steel Housing [mm (in.)]



Dual-head Switches

For the standard housing, the spring rate is 2.1 N/mm (12 lbf/in.) and the spring material is carbon steel/spring steel.

Figure 13 - Standard Housing, No E-stop [mm (in.)]

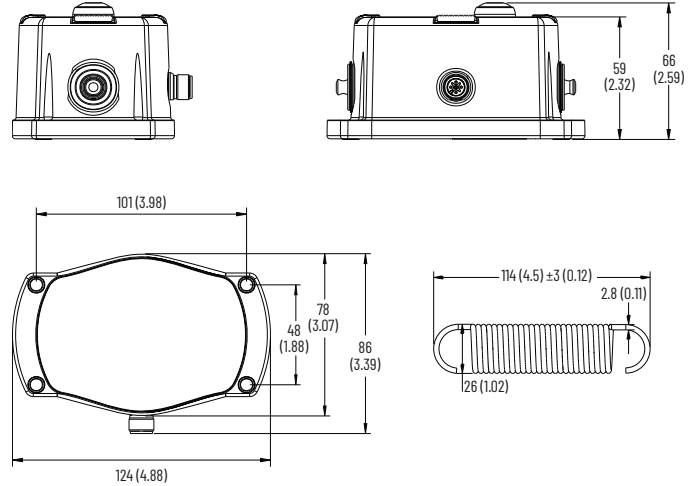
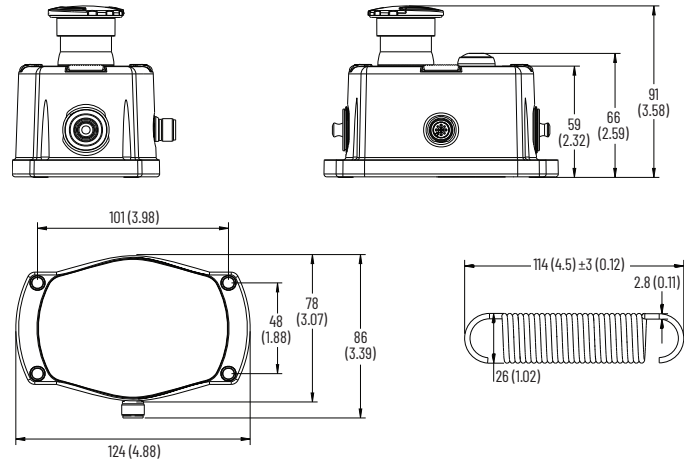
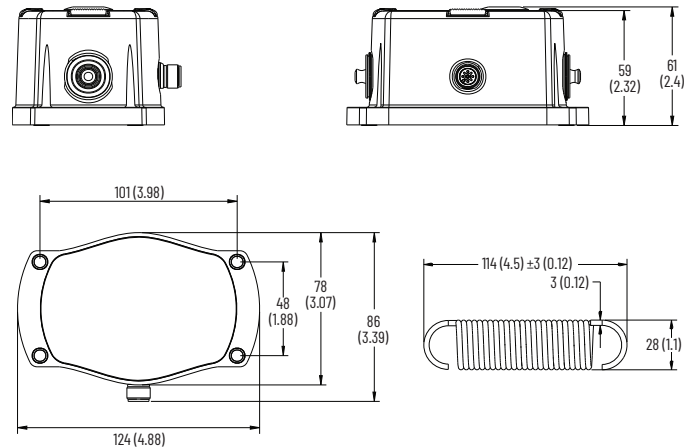


Figure 14 - Standard Housing, with E-stop [mm (in.)]



For the stainless-steel housing, the spring rate is 2.1 N/mm (12 lbf/in.) and the spring material is 302 stainless steel.

Figure 15 - Stainless-steel Housing [mm (in.)]



Lifeline 5 Electronic Monitored E-stop

The Lifeline™ 5 Electronic Monitored E-stop is a microprocessor-based solution with advanced features and diagnostics that help enhance safety and improve productivity.



Features

- Solid-state operation
- Enhanced safety and productivity with microprocessor-based reliability and advanced diagnostics
- Performs at the highest safety ratings
 - TÜV Certified
 - PLe Cat 4 according to EN ISO 13849-1, IEC 60947-5-5, IEC 61508, and NFPA 79
- Rugged die-cast aluminum (IP66) housing
- Wide operating temperature range of -20...+75 °C (-4...+167 °F)
- 270° visible status indicators offer diagnostic for switch and tensioning setup
- Auto-detect between OSSD and GuardLink® mode

Specifications

Attribute	Cat. No. 440E-LL5SNE5
Safety Ratings	
Standards Safety classification	PLe Cat 4 according to EN ISO 13849-1, IEC 60947-5-5, IEC 61508, and NFPA 79
Functional safety data	PFHd = 1.45E-9 (average frequency of a dangerous failure per hour) T1 = 20 (Proof test interval)
Certifications	CE Marked for all applicable directives, UKCA marked for all applicable regulations, cULus Listed (UL 508), CCC Marked, and TÜV Certified
Operating Characteristics	
Operating voltage	24V DC +10%/-15% Class 2 SELV or PELV power supply
Response time (off)	60 ms
Utilization category according to Ue Ie	DC-12 and DC-13 24V 200 mA
Frequency of operating cycle	0.25 Hz
Off-state output current	< 0.5 mA
Outputs	
Safe state	De-energized (2 x PNP, 0V), AUX energized (1 x PNP, 24V)
Run state	Energized (2 x PNP, 24V), AUX de-energized (1 x PNP, 0V)
No-load supply current	< 50 mA
Load current	200 mA maximum
Voltage drop	< 2V
Mechanical	
Housing material	Aluminum
Environmental	
Operating temperature	-20...+75 °C (-4...+167 °F)
Operating humidity	5...95% relative
Washdown rating	IP66
Shock and vibration	IEC 60068-2-27: 30 g (1.05 oz), 11 ms IEC 60068-2-6: 10...500 Hz
Pollution degree	IEC 60947-1: 3

Attribute	Cat. No. 440E-LL5SNE5
Electromagnetic Compatibility (EMC) ⁽¹⁾	
Electrostatic Discharge ESD	IEC 61000-4-2: Air discharge
	IEC 61000-4-2: Contact discharge
Radiated EMF immunity	IEC 61000-4-3
Electrical fast transient/burst immunity	IEC 61000-4-4
Conducted immunity	IEC 61000-4-6
Rated impulse withstand voltage	IEC 60947-1: 1 kV
Protection	Short circuit, overload, reverse polarity, overvoltage, loss of ground

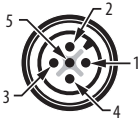
(1) EMC requirements were tested to safety levels per IEC 61326-3-1.

Product Selection

Description	Cat. No. ⁽¹⁾	Outputs	Connection	Connection Cable ⁽²⁾
Lifeline 5 with E-stop	440E-LL5SNE5	2 OSSD outputs, 1 aux output	5-pin micro (M12)	889D-F5AC-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 3 - 5-pin Connection

	Pin	Color	Function	
			OSSD Mode	GuardLink Mode
	1	Brown	+24V DC	+24V DC
	2	White	Safety OSSD 1 Output	Safety Out
	3	Blue	0V	Ground 0V
	4	Black	Safety OSSD 2 Output	Safety In
	5	Gray	Auxiliary Output	CLU

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

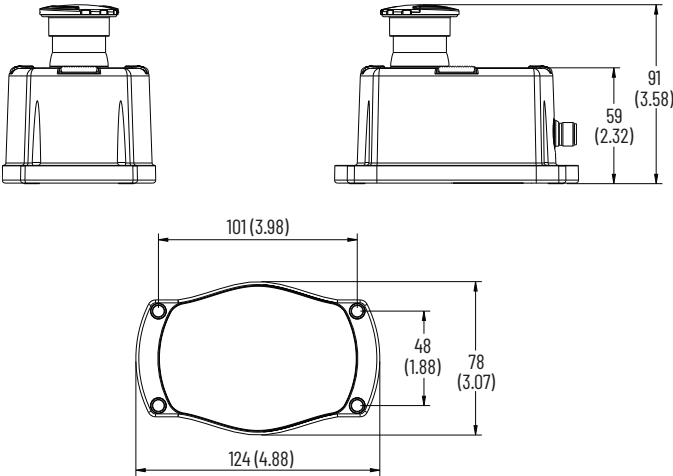
- (1) Replace the 2 with 5 (5 m [16.4 ft]) or 10 (10 m [32.8 ft]) for standard cable lengths.

IMPORTANT If you do not require the auxiliary signal, a 4-pin cordset (Cat. No. 889D-F4AC-2) can be used.

The recommended patchcord for use with ArmorBlock® Guard I/O™ is 2 m (6.5 ft) - 889D-F4ACDM-2. Replace the 2 with OM3 (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.

Approximate Dimensions

Figure 16 - Electronic E-stop (Cat. No. 440E-LL5SNE5) [mm (in.)]



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)	600V	500V	240V	120V
	A600/AC-15 (Ie)	1.2 A	1.4 A	3.0 A	6.0 A
	DC-13 (Ue)	24V			
	DC-13 (Ie)	2 A			
Operating Characteristics					
Cable span between switches, max		• 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 lock out		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		• 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 14](#).

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 4](#).

(2) With an 8-pin micro (M12) connector, not all contacts are connected. See [Typical Wiring Diagrams on page 16](#).

(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 16](#).

Table 4 - 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 5 - 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

Figure 17 - Standard Model [mm (in.)]

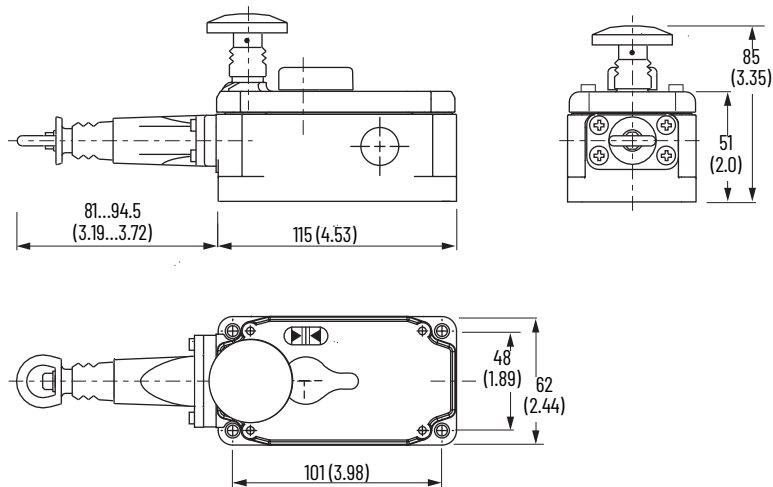
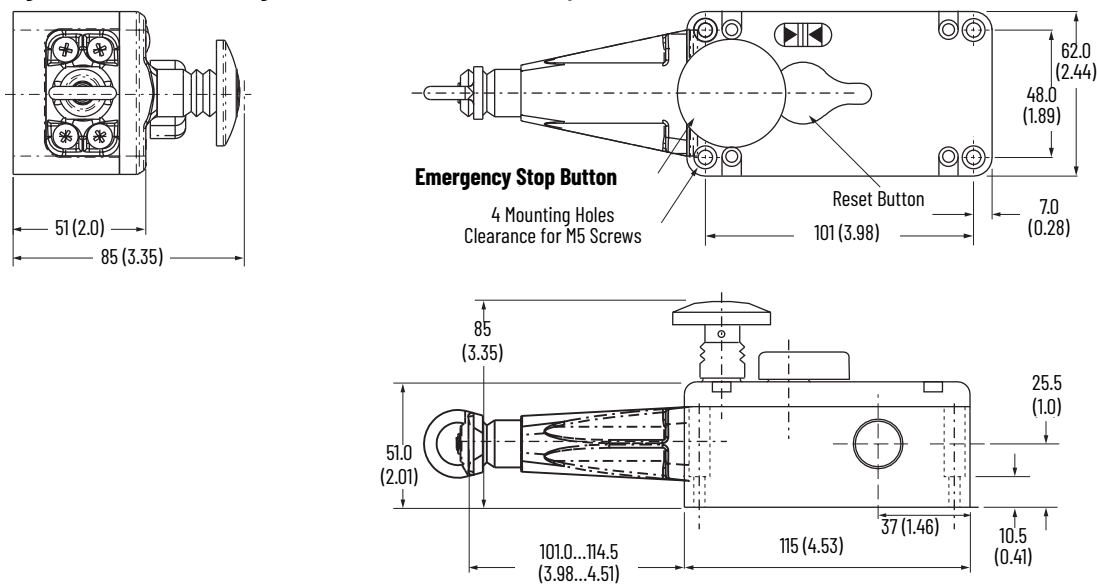
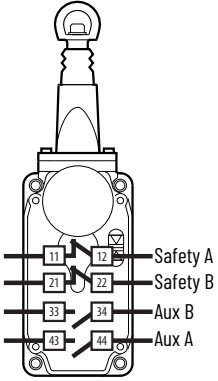
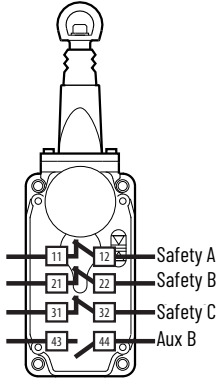
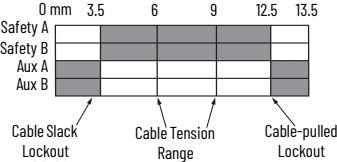
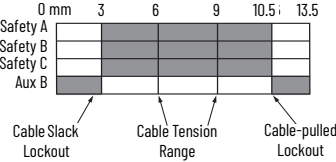
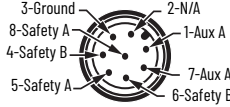
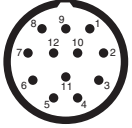


Figure 18 - Extended Length Models (75...125 m Cable Span) [mm (in.)]



Typical Wiring Diagrams

Description		2 N.C. and 2 N.O.	3 N.C. and 1 N.O.
Contact configuration			
Contact action □ Open ■ Closed			
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 316 stainless steel and is suitable for external use, applications with hygiene requirements, and other situations that require a level of corrosion resistance.

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.

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 316 stainless steel to withstand harsh conditions.
- Universal mounting and operation
- Switch lockout on cable pull and cable release
- Made from 316 stainless steel
- 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	- Housing: 316 stainless steel - 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 4 on page 14](#)

Table 6 - Connection Systems

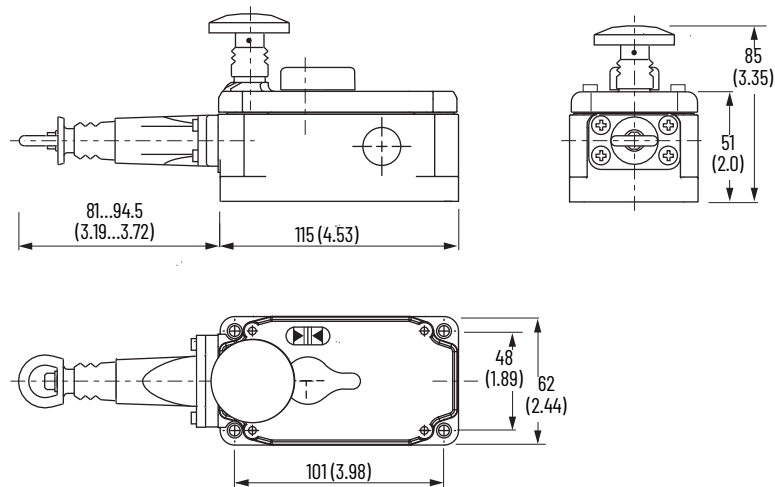
Description	12-pin M23
Cordset	889M-F12X9AE-x ⁽¹⁾
Patchcord	889M-F12AHMU-y ⁽²⁾

(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.

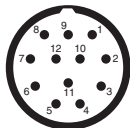
(2) y = 0M3 (0.3 m [1 ft]), 0M6 (0.6 m [2 ft]), 1 (1 m [3.3 ft]), 2 (2 m [6.6 ft]), or 3 (3 m [9.8 ft]) for standard cable lengths.

Approximate Dimensions

Figure 19 - Standard Model [mm (in.)]



Typical Wiring Diagrams

Description		2 N.C. and 2 N.O.																																				
Contact configuration																																						
Contact action		<table border="1"><thead><tr><th></th><th>0 mm</th><th>3.5</th><th>6</th><th>9</th><th>12.5</th><th>13.5</th></tr></thead><tbody><tr><td>Safety A</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Safety B</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Aux A</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Aux B</td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table> □ Open ■ Closed Cable Slack Lockout Cable Tension Range Cable Pulled Lockout			0 mm	3.5	6	9	12.5	13.5	Safety A							Safety B							Aux A							Aux B						
	0 mm	3.5	6	9	12.5	13.5																																
Safety A																																						
Safety B																																						
Aux A																																						
Aux B																																						
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	Safety A																																				
	Blue	Safety B																																				
	White	Aux A																																				
	Green	Aux B																																				
	Yellow/Gray	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 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 (see [Lifeline Rope Tensioner System on page 25](#)).



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		• 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 22](#).

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 4 on page 14](#).
(2) With an 8-pin micro (M12) connector, not all contacts are connected. See [Typical Wiring Diagrams on page 23](#).
(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 23](#).

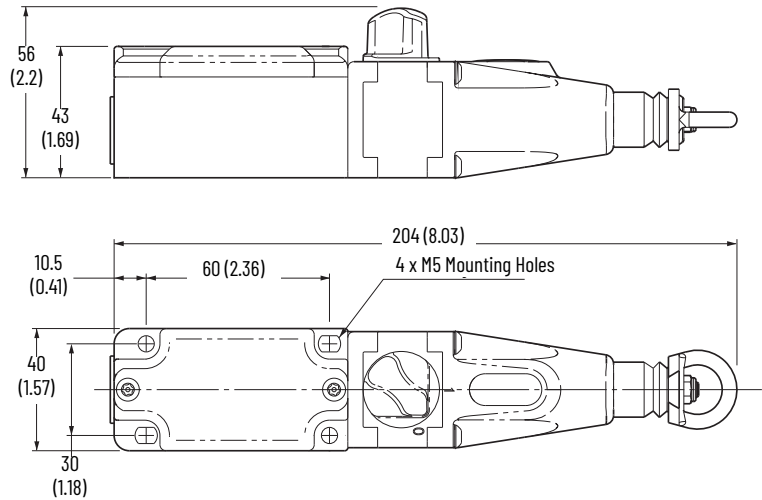
Table 7 - Connection Systems

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

Figure 20 - 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	Safety A
		Yellow Pink Safety B	Safety B
		White Blue Aux A	Aux A
		Green Ground	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.

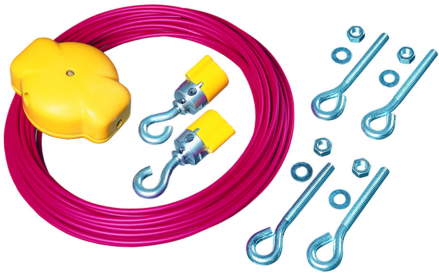
(3) y = 0F5 (0.5 ft [1.6 ft]) or 1F (1 ft [3.3 ft]) for standard cable lengths.

Notes:

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 that you can also use the system for applications other than cable-actuated emergency stop systems.

Specifications

Attribute	Lifeline Rope Tensioner System
Material	• 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	• Tensioner: Yellow • Cable gripper: Yellow/natural • Cable: Red • P-bolt: Natural
Weight	• 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

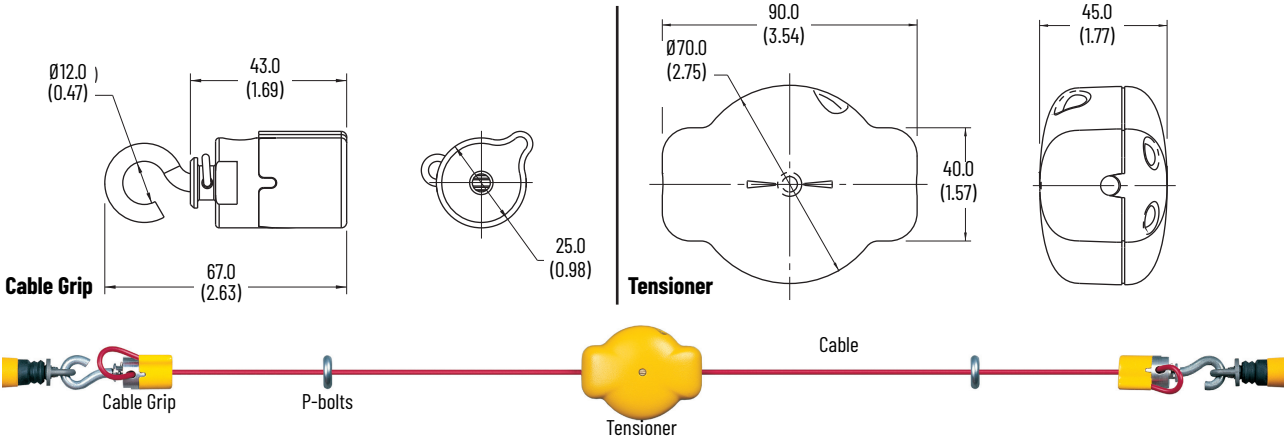
Product Selection

	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
 Red Cable	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 Switch on page 17](#)).

Approximate Dimensions

Figure 21 - 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
	316 stainless steel 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
	316 stainless steel inside corner pulley		440E-A13205
	Stainless-steel outside corner pulley		440E-A13206

Lifeline 5 Cable Pull Switches

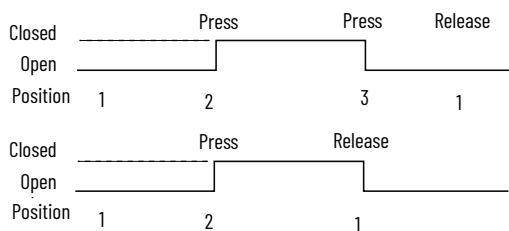
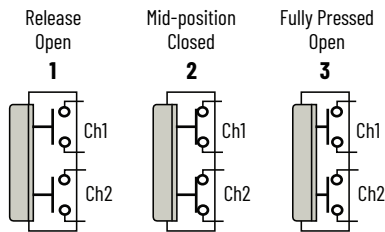
Description		Cat. No.
	Steel replacement spring	440E-ASPRING
	Stainless-steel replacement spring	440E-ASPRING-SS

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:

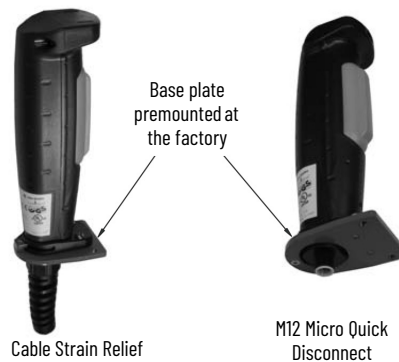
- Standard switch with no additional buttons
- Switch with an additional single normally open (N.O.) contact
- Switch with an additional dual-channel E-stop button

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 22 - 440J Enabling Switch with Base Plate



Some applications only require the operation of the switch contacts. In this case, the catalog number 440J-A00N mounting bracket is used.

Figure 23 - 440J Enabling Switch with Mounting Bracket



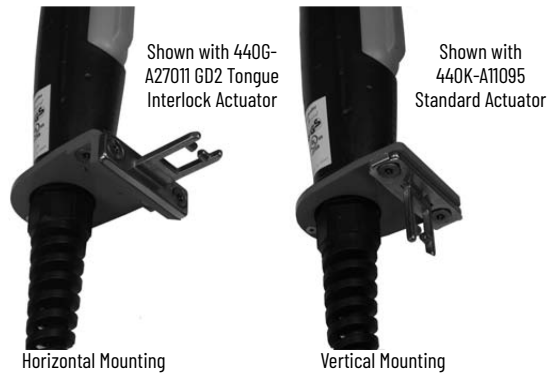
Add additional accessory brackets to achieve various arrangements. The catalog number 440J-A01N right-angle bracket accommodates the catalog number 440K-A11238 standard actuator (for use with the standard Trojan™ 6 or Trojan T15 tongue interlock) and the GD2 catalog number 440G-A27011 actuator (for use with the GD2 tongue interlocks).

Figure 24 - 440J-A01N Bracket



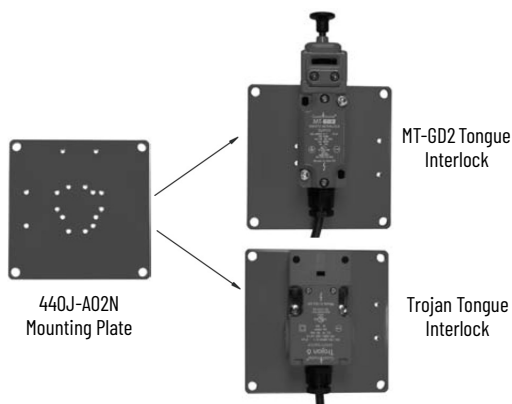
With two additional screws, you can mount the right angle bracket to the 440J enabling switch for horizontal mounting. You can mount an actuator for vertical use without the catalog number 440J-A01N bracket.

Figure 25 - Horizontal and Vertical Mounting



The catalog number 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 26 - 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 catalog number 440J-A02N mounting plate as you cannot rotate the head.

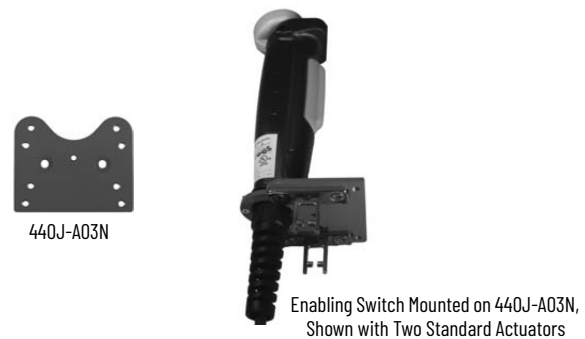
For single-switch mounting, we recommend that you use the 440K-MT (MT-GD2) tongue interlock with the latch release. The latch holds the contacts closed when the enabling switch is bumped or rattled. Alternatively, use the 440K-T (Trojan 6 or T15 tongue interlocks) with a vertical mounting. The holding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

Figure 27 - Single-switch Mounting



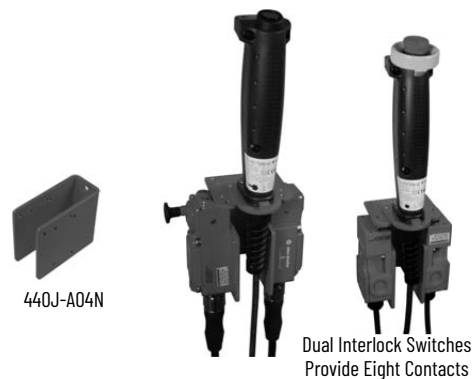
In some applications, you need additional contacts when you use the enabling switch. Two additional accessories are available to allow the enabling switch to interact with two interlocks.

The catalog number 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 catalog number 440K-A04N accessory.



The U-shaped plate (catalog number 440J-A04N) can accommodate two tongue interlocks: Either 440K-MT or 440K-T. When you use the catalog number 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:

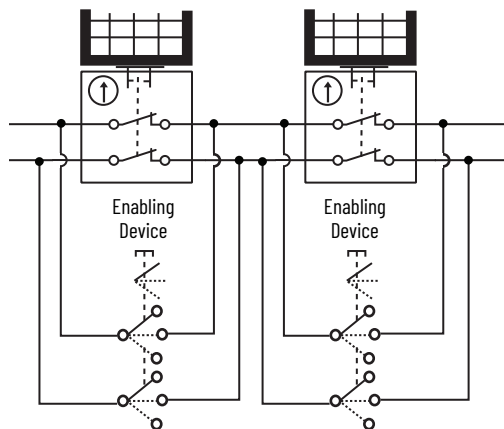
- Set the machine in a reduced performance mode.
In some cases, the speed or other characteristic of the machine must reduce so you can release or squeeze the trigger switch to avoid the hazard. Design the control system so that the machine does not change back to normal performance during the enabling 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.

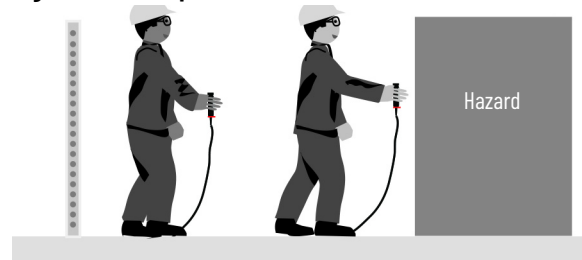


For full body access, consider whether the primary safeguard can or must be active during the operation of the enabling device. With the primary safeguard active, additional entries into the hazardous area are detected. If the primary safeguard must remain inactive, administrative procedures must confirm 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 28 - Multiple Personnel Access



[Table 8](#) 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 8 - 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	
Full body	All types	Monitoring safety relay	Single interlock with four contacts
		Safety PLC	Single interlock with four contacts
		Monitoring safety relay	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 9 - 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)				• Position 2: 15 N approximate • Position 3: 50 N maximum					
Actuation frequency, max				1200 operations per hour					
Protection				• 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 9 - 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	• 440J-N2ITNPM: 195 g (0.43 lb) • 440J-N2ITNPM-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	• Position 1 - 2 - 1: 1,000,000 operations • Position 1 - 2 - 3 - 1: 100,000 operations
Electrical life	• 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-N2ITNPM
Switch with jog button	440J-N2ITNPM-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.

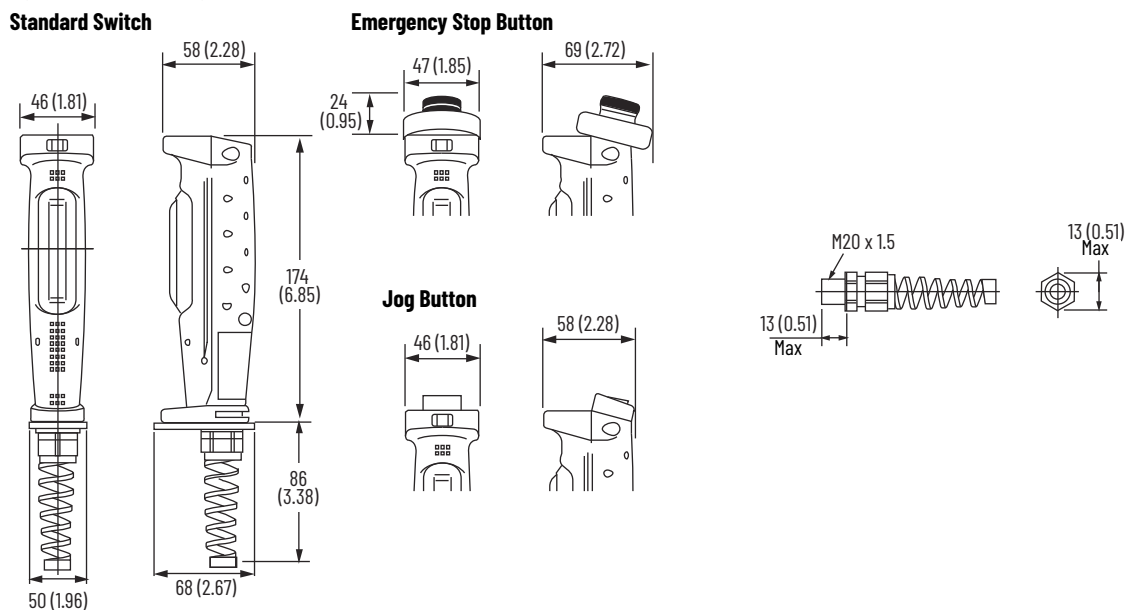
Accessories

	Description	Cat. No.
	Mounting bracket suitable for one 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 one enabling switch and one 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 one 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

Figure 29 - 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 30 - Enabling Switch Mounting Bracket (Catalog Number 440J-A00N) [mm (in.)]

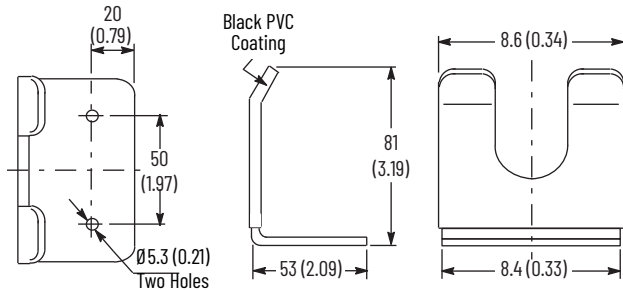


Figure 33 - Double Actuator Plate (Catalog Number 440J-A03N) [mm (in.)]

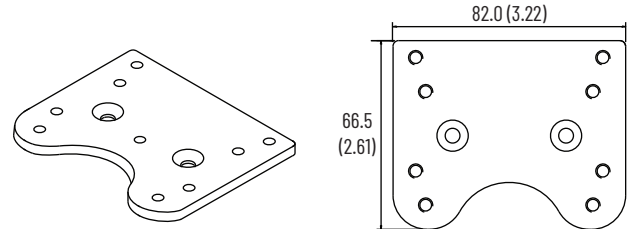


Figure 31 - Single Actuator Bracket (Catalog Number 440J-A01N) [mm (in.)]

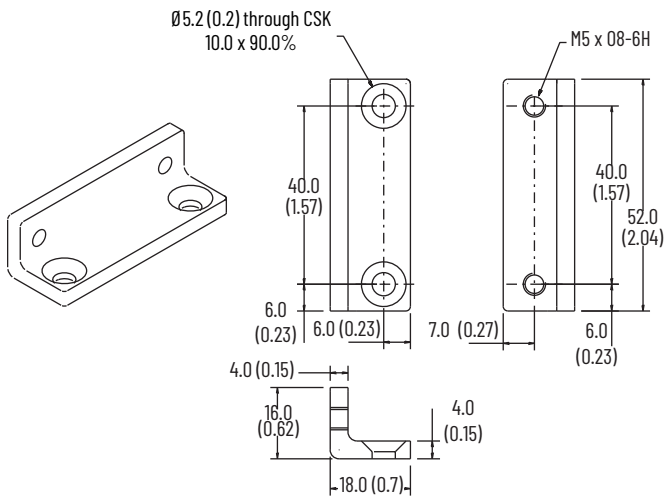


Figure 34 - Double Safety Switch Bracket (Catalog Number 440J-A04N) [mm (in.)]

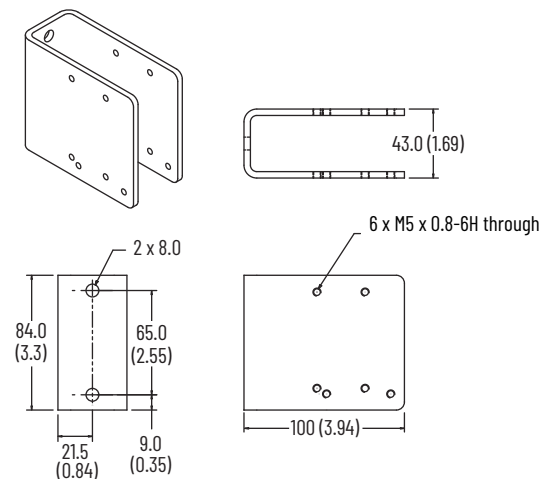
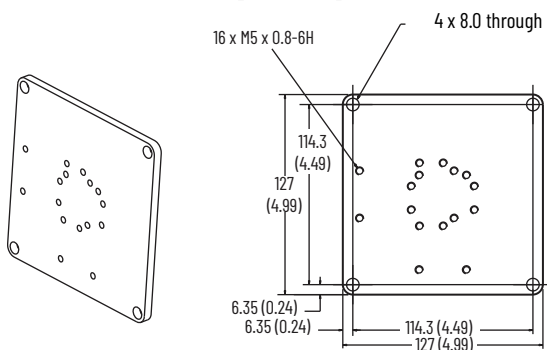


Figure 32 - Single Safety Switch Plate (Catalog Number 440J-A02N) [mm (in.)]



Typical Wiring Diagram

	Standard				With Jog Button				With E-stop Button			
Contact operation	Position 1 Position 2 Position 3 Terminal No. 1-2 5-6 3-4 Squeeze Release Safety A Aux Safety B				Position 1 Position 2 Position 3 Terminal No. 1-2 5-6 3-4 Squeeze Release Safety A Aux Safety B Jog				Position 1 Position 2 Position 3 Terminal No. 1-2 3-4 Squeeze Release Safety A Safety B E-stop A E-stop B			
Cable termination												
Quick disconnect termination	2-Safety A 1-Safety A 3-Safety B 4-Safety B 5-Safety B 2-Safety A 3-N/A 1-Safety A 4-Safety B				5-Safety B 8-Jog 4-Safety B 5-Aux 2-Safety A 1-Safety A 7-Jog 6-Aux				3-Safety B 8-E-stop B 4-Safety B 5-E-stop A 2-Safety A 1-Safety A 7-E-stop A 6-E-stop B			
Mating cordsets	889D-F4AC-x		889D-F5AC-x		889D-F8AB-x		889D-F8AB-x					
	1 Brown	Safety A	1 Brown	Safety A	1 White	Safety A	1 White	Safety A	1 White	Safety A	1 White	Safety A
	2 White		2 White		2 Brown		2 Brown		2 Brown		2 Brown	
	—		3 Blue	—	3 Green	Safety B	3 Green	Safety B	3 Green	Safety B	3 Green	Safety B
Mating cordsets	3 Blue	Safety B	4 Black	Safety B	5 Gray	Aux	5 Gray	E-stop A	5 Gray	E-stop A	5 Gray	E-stop A
	4 Black		5 Gray		6 Pink		6 Pink		6 Pink		6 Pink	
	—		—		7 Blue	Jog	7 Blue	E-stop B	7 Blue	E-stop B	7 Blue	E-stop B
	—		—		8 Red		8 Red		8 Red		8 Red	

Notes:

Notes:

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Local Technical Support Phone Numbers	Locate the telephone number for your country.	rok.auto/phonesupport
Technical Documentation Center	Quickly access and download technical specifications, installation instructions, and user manuals.	rok.auto/techdocs
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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