

Safety Switches Specifications

Bulletin Numbers 440G, 440H, 440K, 440N, and 440T

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Safety switches are used to safeguard hazardous areas. Rockwell Automation provides a number of different safety switch configurations. This document describes guard locking, hinge, and interlock switches.

Guard locking switches are used to protect an area when a danger is not immediately removed after a stop request, as in the case of high inertia rotating machines, fast rotating machines, and machines where high pressure needs to be released from pneumatic valves.

Hinge switches, when triggered, close specific normally open (accessible) doors or guards.

Interlock switches monitor the position of a guard or gate. They can be used to shut off power, control personnel access, and prevent a machine from starting when the guard is open.



Guard Locking Switches

Bulletin Number 440G

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440G-EZ Electromagnetic Safety Switches

The 440G-EZ electromagnetic safety switches have the following features:

- Process and machine protection per ISO 14119
- Certified to PLe per ISO 13849-1 (for door position)
- Non-contact interlocking device with a power-to-lock (PTL) electromagnetic locking function for process protection
- Switches can be connected in series
- Sensor can be mounted in either a surface mount or a flush mount
- Ease of installation and alignment; no tongue interlocks
- Increased efficiency and productivity by minimized downtime
- Reduced long-restart delays
- Status indicators for switch and lock status
- High tolerance to door offset within 5 mm (.2 in.) in all directions.
- Reduced accumulation of scrap



Specifications

Attribute	440G-EZS21STL05J, 440G-EZS21STL05H, 440G-EMAS
Functional Safety Data (Guard door sensing)	1.5 x 10 ⁻⁸ (EN ISO 13849). Mission time/PTI: 20 years
Safety Ratings	
Standards	ISO 14119, IEC 60947-5-3, ISO 13849-1, IEC 62061
Safety classification: Guard position sensing	Type 4 interlocking device with guard locking per ISO 14119 Ple cat. 4 per ISO 13849-1 and SIL 3 per IEC 62061
Functional safety	Visit https://literature.rockwellautomation.com/idc/groups/literature/documents/sr/safety-sr001_-en-e.pdf
Certifications	CE marked for all applicable EU directives, c-UL-us (UL508), TÜV, C-Tick www.rockwellautomation.com/certification/overview.page
Operating Characteristics	
Safe switch on distance	4 mm (0.16 in.)

Attribute	440G-EZS21STL05J, 440G-EZS21STL05H, 440G-EMAS
Typical switch on distance	15 mm (0.59 in.)
Safe switch off distance	45 mm (1.77 in.)
Holding force	500 N
Retaining force	25 N
Maximum actuation frequency	0.5 Hz
Alignment tolerance for locking device	<ul style="list-style-type: none"> • Vertical: 5 mm (0.2 in.) • Horizontal: 5 mm (0.2 in.)
Aperture angle	3°
Offset tolerance	5 mm (0.2 in.)
Rated voltage	24V DC
Insulation voltage Ui	32 V
Rated impulse withstand voltage Uimp	1.5 kV
Supply voltage when an individual safety switch is connected	24V DC (19.2...28.8 V DC)
Supply voltage UV when a cascade is connected	<ul style="list-style-type: none"> • Sensor: 24V DC (22.8...28.8 V DC) • Magnet: 24V DC (21.6...28.8 V DC)
Power consumption	<ul style="list-style-type: none"> • Locking active: 350 mA • Locking deactivated: 50 mA
Switching frequency	≤0.5 Hz
Type of output	OSSD
Maximum Output current	≤100 mA
Diagnostic output	≤25 mA, short-circuit protected
Cable capacitance	400 nF (for OUT A and OUT B)
Response time	50 ms
Enable time	100 ms
Risk time	100 ms
Power up delay	2.5 s
Muting time when supply voltage is interrupted	4 ms
Environmental	
Operating temperature	-20...+55 °C (-4...+131 °F)
Storage temperature	-25...+55 °C (-4...+131 °F)
Relative humidity	50% at 70C (IEC 60947-5-2)
Enclosure ingress rating	IP67
Shock and vibration	IEC EMC: EN IEC 61326-3-1, EN IEC 60947-5-2, EN IEC 60947-5-3
Outputs	
Safety outputs	2 x OSSDs, 2 x PNP, max. 100 mA, short-circuit protected and overload-proof
Auxiliary output	25 mA max, short-circuit protected (resistive load)
Switching voltage	<ul style="list-style-type: none"> • ON State: 19.2...28.8 V DC • OFF State: 0...2 V DC
Switching current	<ul style="list-style-type: none"> • ON State: ≤100 mA • OFF State: ≤500 µA
Shock and vibration	300 µs
Weight	
Sensor	510 g (18 oz)

Attribute	440G-EZS21STL05J, 440G-EZS21STL05H, 440G-EMAS
Actuator	210 g (7.4 oz)
Material	
Sensor housing	Anodized aluminum
Actuator housing	Fiber-glass-reinforced PVC
Anchor plate	Nickel-plated steel

Product Selection

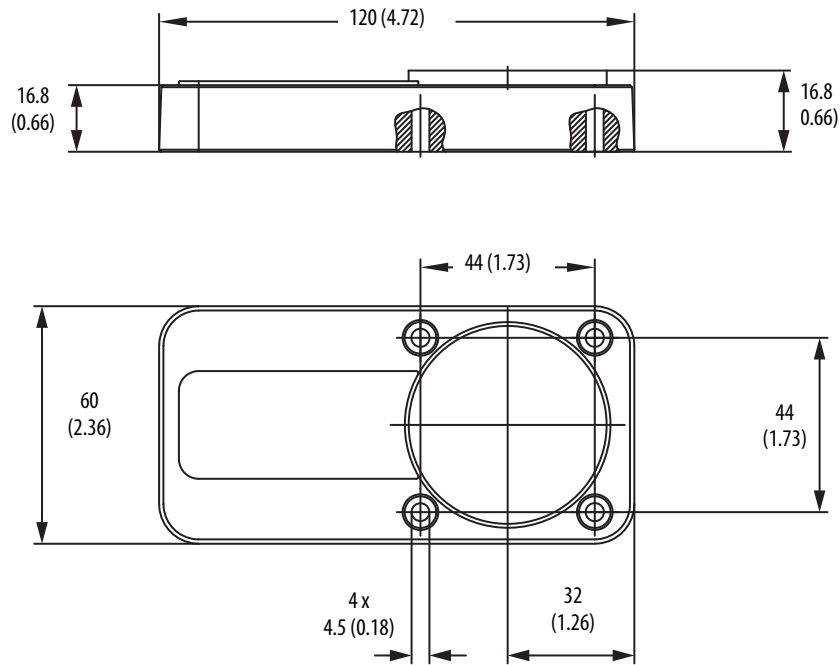
Description	Cat. No.
5-pin electromagnetic safety switch	440G-EZS21STL05J
8-pin electromagnetic safety switch	440G-EZS21STL05H

Accessories

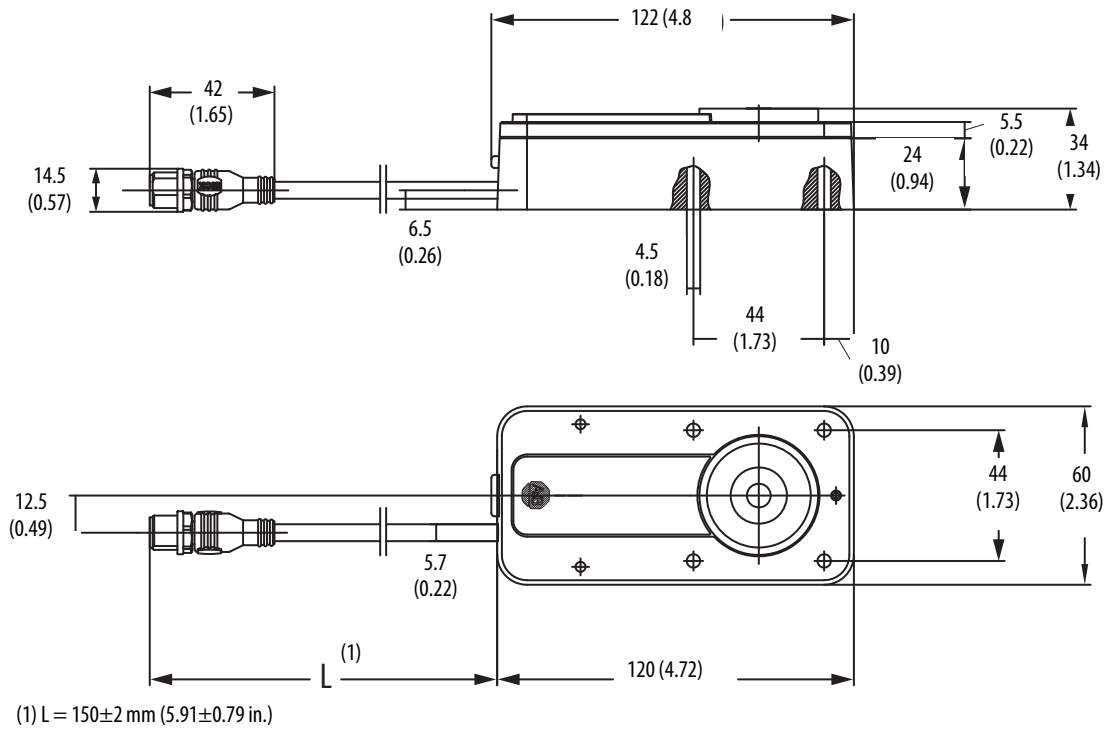
Description	Cat. No.
Replacement actuator	440G-EMAS

Approximate Dimensions

Actuator [mm (in.)]



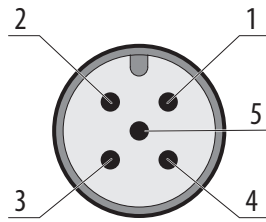
Sensor [mm (in.)]



At the End of Life, this equipment should be collected separately from any unsorted municipal waste.

Typical Wiring Diagrams

Device Connection Pin Assignment (Male Connector, M12, 5-pin, A-coded)

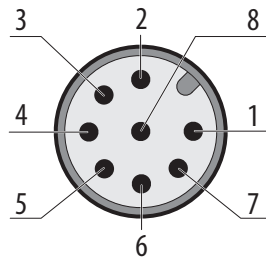


Pin	Wire Color ⁽¹⁾	Designation	Description
1	Brown	+24V DC	Safety switch voltage supply
2	White	OSSD 1	OSSD 1 output
3	Blue	0V	0V DC voltage supply
4	Black	OSSD 2	OSSD 2 output
5	Gray	Magnet	Magnet activation 24V DC

(1) Applies to the extension cables recommended as accessories.

IMPORTANT Pay attention to tightness of the plug connector.

Device Connection Pin Assignment (Male Connector, M12, 8-pin, A-coded)



Pin	Wire Color ⁽¹⁾	Designation	Description
1	White	Aux	Application diagnostic output (not safe)
2	Brown	+24V DC	Safety switch voltage supply
3	Green	Magnet	Magnet activation 24V DC
4	Yellow	In 2	OSSD 2 input ⁽²⁾
5	Gray	OSSD 1	OSSD 1 output
6	Pink	OSSD 2	OSSD 2 output
7	Blue	0V	0V DC voltage supply
8	Red	In 1	OSSD 1 input

(1) Applies to the extension cables recommended as accessories.

(2) When used as an individual safety switch or as the first safety switch in a cascade apply 24V DC.

IMPORTANT Pay attention to tightness of the plug connector.

440G-LZ Guard Locking Switches

The 440G-LZ guard locking switches have the following features:

- Certified to PLe to ISO 13849-1 (both for door position and lock monitoring to ISO 14119)
- Solid-state design and monitored outputs
- Type 4 interlocking device with guard locking per ISO 14119 with low or high coded RFID actuators
- High holding force of 1,300 N
- Energy efficient green device that only uses 2.5 W
- IP69k and hygienic design
- Power-to-release and power-to-lock versions
- Auxiliary output versions: lock status or guard proximity
- Compact design optimized for ease of mounting
- Diagnostic information provided by two bright 270° LEDs
- Solid-state OSSD outputs series connectable to ISO 14119



Specifications

Attribute	Value
Safety ratings	
Standards	ISO 14119, IEC 60947-5-3, ISO 13849-1, IEC 62061
Safety classification	Type 4 interlocking device with guard locking per ISO 14119 with low (standard) and high (unique) coding per ISO 14119 PLe Cat 4 per ISO 13849-1 and SIL 3 per IEC 62061
Functional safety	Visit https://literature.rockwellautomation.com/idc/groups/literature/documents/sr/safety-sr001_-en-e.pdf
Certifications	cULus Listed, TÜV Certified, and CE Marked for all applicable directives www.rockwellautomation.com/certification/overview.page
Operating characteristics	
Torque for M5 mounting of switch and actuator mounting bracket	2 N·m, max
Locking bolt insertion for assured locking & holding force	Min of 5 mm (0.19 in.), max of 10 mm (0.39 in.)
Locking bolt alignment tolerance X, Y, Z	Max of ±2.5 mm (0.09 in.)
Holding force Fmax (ISO 14119)	1,690 N
Holding force Fzh (ISO 14119)	1,300 N
Output current, max (each output)	200 mA
Quiescent power consumption, locked or unlocked	2.5 W
Peak current and duration, at turn on or after lock/unlock operation	400 mA / 100 ms
Operating voltage Ue	24V DC +10% / -15% Class 2 SELV
Maximum frequency of operating cycles	0.2 Hz
Dwell time between subsequent locking/unlocking	2.5 s
Response time (off)	100 ms first switch, 50 ms additional for each switch
Risk time (according to IEC 60947-5-3)	100 ms
Start up time (availability)	8 s

Attribute	Value
Maximum length of a chain of switches	10 km (dependent on cable/ connection/required response time)
Utilization category (IEC 60947-5-2)	DC-13 24V 200 mA
Insulation voltage Ui (IEC 60947-1)	75V
Impulse withstand voltage Uimp (IEC 60947-1)	1 kV
Pollution degree (IEC 60947-1)	3
Manual (auxiliary) release	Built in
Protection class (IEC 61140)	Class II
Mechanical life	500,000 cycles
Outputs (guard door closed and locked)	
Safety outputs	2 x PNP, 0.2 A max / ON (+24V DC)
Auxiliary outputs	1 x PNP, 0.2 A max / OFF (0V DC)
Environmental	
Operating temperature	0...+55 °C (+14...+131 °F)
Storage temperature	-25...+75 °C (-13...+167 °F)
Operating humidity	5...95% relative
Enclosure ingress rating	NEMA 3, 4X, 12, 13, IP66, IP67, IP69k
Shock and vibration	IEC 60068-2-27 30 g, 11 ms/IEC 60068-2-6 10...55 Hz, 1 mm
Hygienic	ISO 14159:2004 and EN 1672-2005, (for that part of the machine defined as "food splash area")
Washdown	Sodium Hydroxide based washdown fluids
Radio frequency / EMC	IEC 60947-5-3, FCC-1(Parts 18&15), R&TTE
General	
Materials	ABS, locking bolt and mounting bracket 304 stainless steel
Weight	Switch 400 g (0.9 lb), actuator 150 g (0.3 lb), actuator mounting bracket 60 g (0.1 lb)
Protection Type	Short-circuit, current limitation, overload, reverse polarity, overvoltage (up to 60V max), thermal shutdown/restart

Product Selection

Locking Type	Actuator Type	Cat. No.					
		Connector Type					
		Aux. Output = Lock Aux.			Aux. Output = Door Aux.		
		3 m Lead	10 m Lead	6-in. Pigtail with M12 8-Pin QD	3 m Lead	10 m Lead	6-in. Pigtail with M12 8-Pin QD
Power to release	Standard (low level to ISO 14119)	440G-LZS21SPRA	440G-LZS21SPRB	440G-LZS21SPRH	440G-LZS21STRA	440G-LZS21STRB	440G-LZS21STRH
	Unique (high level to ISO 14119)	440G-LZS21UPRA	440G-LZS21UPRB	440G-LZS21UPRH	440G-LZS21UTRA	440G-LZS21UTRB	440G-LZS21UTRH
Power to lock	Standard (low level to ISO 14119)	440G-LZS21SPLA	440G-LZS21SPLB	440G-LZS21SPLH	440G-LZS21STLA	440G-LZS21STLB	440G-LZS21STLH
	Unique (high level to ISO 14119)	440G-LZS21UPLA	440G-LZS21UPLB	440G-LZS21UPLH	440G-LZS21UTLA	440G-LZS21UTLB	440G-LZS21UTLH

Accessories

Table 1 - Spare Actuators

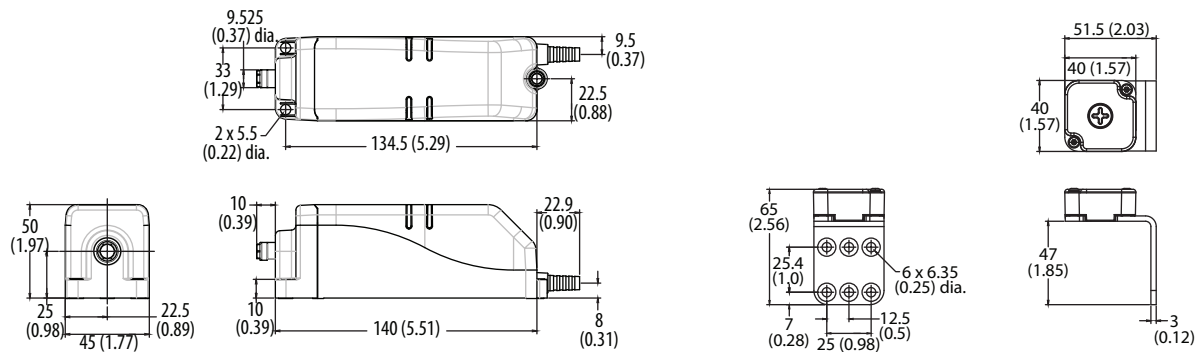
Locking Type	Actuator Type	Cat. No.
Power to release	Standard (low level ISO 14119)	440G-LZASPR
	Unique (high level ISO 14119)	440G-LZAUPR
Power to lock	Standard (low level ISO 14119)	440G-LZASPL
	Unique (high level ISO 14119)	440G-LZAUPL

Table 2 - Mounting Brackets

Description	Cat. No.
Actuator Mounting Bracket	440G-LZAM1
Switch body mounting bracket	440G-LZAM2

Approximate Dimensions

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



Typical Wiring Diagrams

8-Pin Micro (M12)			
8-Pin Cordset 889D-F8AB-x⁽¹⁾ or cable version	Color	Function	Pin
	White	Aux	1
	Brown	24V DC +	2
	Green	Lock	3
	Yellow	Safety B+	4
	Grey	Safety A	5
	Pink	Safety B	6
	Blue	Gnd/0V	7
Red	Safety A+	8	

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

440G-MT Guard Locking Switches

The 440G-MT solenoid switch locks a machine guard closed and may only be opened when a signal is applied to the internal solenoid which releases the lock mechanism.

The 440G-MT guard locking solenoid switches have the following features:

- Type 2 Interlocking Device with Guard Locking and low coding per ISO 14119
- High Fzh (holding force): 1500 N (337 lb)
- Mechanical lock (power-to-release)
- Heavy-duty, die-cast alloy housing for use in harsh environments
- Diagnostic version available with built-in LED to indicate door status independent of lock status



Specifications

Attribute	Value			
Safety ratings				
Standards	ISO 14119, IEC 60947-5-1			
Safety classification	Type 2 Interlocking Device with Guard Locking and low coding per ISO 14119			
Functional safety	Visit https://literature.rockwellautomation.com/idc/groups/literature/documents/sr/safety-sr001_en-e.pdf			
Certifications	cULus Listed, TÜV Certified, and CE Marked for all applicable directives www.rockwellautomation.com/certification/overview.page			
Outputs				
Safety contacts ⁽¹⁾	3 N.C. or 2 N.C. direct opening action			
Auxiliary contacts	1 N.O. or 2 N.O.			
Thermal current/ <i>I_{th}</i>	10 A			
Rated insulation voltage (U _i)	500V			
Switching current @ voltage, min	3 mA @ 18V DC			
Utilization category				
A600/AC-15 (Ue)	600V	500V	240V	120V
A600/AC-15 (Ie)	1.2 A	1.4 A	3 A	6 A
DC-13 (Ue)	24V			
DC-13 (Ie)	2 A			
Solenoid characteristics				
Locking type	Power to release			
Holding force, max	1600 N (360 lbf)			
Power supply	24V AC/DC or 110V AC or 230V AC			
Solenoid power	13 W typical 100% ED			
Operating characteristics				
Break contact force, min	6 N (1.35 lbf)			
Actuation speed, max	160 mm (6.29 in.)/s			
Actuation frequency, max	2 cycles/s			
Operating radius, min	60 mm (2.36 in.)			
Mechanical life	1,000,000 operations			

Attribute	Value
Environmental	
Enclosure type rating	IP67
Operating temperature	-25...+60 °C (13...+140 °F)
Physical characteristics	
Housing Material	Painted zinc alloy
Actuator Material	Stainless Steel
Weight [g (lb)]	1400 (3.08)
Color	Red

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

Product Selection

Solenoid Voltage	Contact			Actuator Type	Cat. No.			
	Safety	Auxiliary	Action		M20 Conduit		Connector ⁽¹⁾	
					M20	1/2 inch NPT	12-Pin M23	8-Pin Micro (M12) ⁽²⁾
24V AC/DC	3 N.C.	1 N.O.	BBM	GD2 standard	440G-MT47037	440G-MT47039	440G-MT47041	440G-M3NBGDH-AC
				Fully flexible	440G-MT47038	440G-MT47040	440G-MT47042	440G-M3NBDH-AC
				—	440G-MT47007	440G-MT47008	440G-MT47043	—
	2 N.C.	2 N.O.	BBM	GD2 standard	440G-MT47044	440G-MT47046	440G-MT47048	—
				Fully flexible	440G-MT47045	440G-MT47047	440G-MT47049	—
				—	440G-MT47010	440G-MT47011	440G-MT47050	—
24V DC with diagnostic function and metal override key	3 N.C.	1 N.O.	BBM	GD2 standard	440G-MT47149	440G-MT47150	440G-MT47151	—
				Fully flexible	440G-MT47152	440G-MT47153	440G-MT47154	—
				No actuator	440G-MT47155	440G-MT47156	440G-MT47157	—
	2 N.C.	2 N.O.	BBM	GD2 standard	440G-MT47158	440G-MT47159	440G-MT47160	—
				Fully flexible	440G-MT47161	440G-MT47162	440G-MT47163	—
				No actuator	440G-MT47164	440G-MT47165	440G-MT47166	—
110V AC/DC	3 N.C.	1 N.O.	BBM	GD2 standard	440G-MT47070	440G-MT47073	—	—
				Fully flexible	440G-MT47071	440G-MT47074	—	—
				—	440G-MT47013	440G-MT47009	—	—
	2 N.C.	2 N.O.	BBM	GD2 standard	440G-MT47077	440G-MT47079	—	—
				Fully flexible	440G-MT47078	440G-MT47080	—	—
				—	440G-MT47012	440G-MT47014	—	—
230V AC/DC	3 N.C.	1 N.O.	BBM	—	440G-MT47016	440G-MT47017	—	—
	2 N.C.	2 N.O.		—	440G-MT47015	440G-MT47024	—	—

(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 [13](#) for wiring details.

Table 3 - Connection Systems

Description	8-Pin Micro	12-Pin M23
Cordset	889D-F8AB-x ⁽¹⁾	889M-F12AH-x ⁽¹⁾
Patchcord	889D-F8ABDM-y ⁽²⁾	889M-F12AHMU-z ⁽³⁾




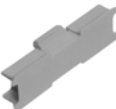
- (1) Replace x with 2 (2 m), 5 (5 m), or 10 (10 m) for standard cable lengths.
- (2) Replace y with 1 (1 m), 2 (2 m), 3 (3 m), 5 (5 m), or 10 (10 m) for standard cable lengths.
- (3) Replace z with 0M3, (0.3 m), 0M6 (0.6 m), 1 (1 m), 2 (2 m) or 3 (3 m) for standard lengths.

Table 4 - Connector Ratings

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

Accessories

Description	Cat. No.
 GD2 standard actuator	440G-A27011
 GD2 flat actuator	440K-A11112
 Fully flexible actuator	440G-A27143
 Sliding bolt actuator	440G-A27163
 Extended flat actuator	440K-A17116

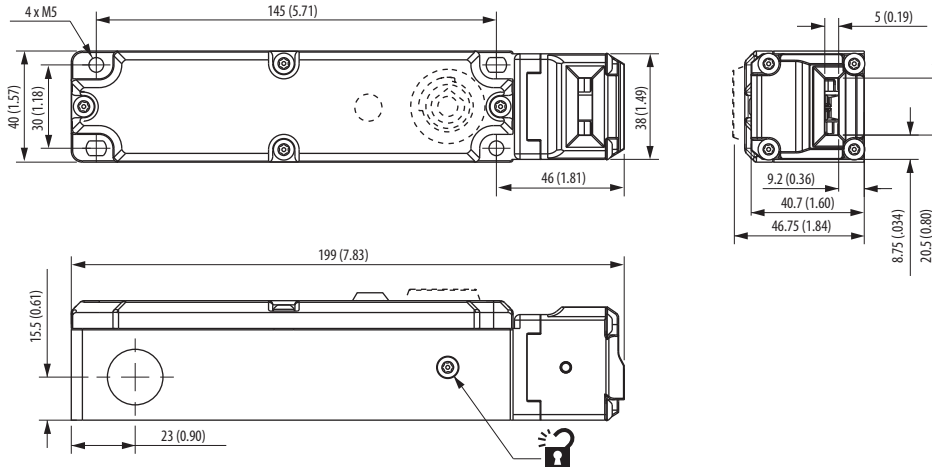
Description	Cat. No.	
 Extended flat actuator	440K-A17116	
	Replacement Cover, No LED, No Override Key	440G-MT47120
	Replacement Cover, LED, Override Key	440G-MT47123
 Emergency override key (See Warning below.)	440G-A36026	
 Dust Cover	440K-A17180	



WARNING: Do not attach the Emergency Override Key to the 440G-MT switch.

Approximate Dimensions

Dimensions are shown in mm (in.). Dimensions are not intended to be used for installation purposes. 2D, 3D, and electrical drawings are available on <https://ab.rockwellautomation.com/>.



Typical Wiring Diagrams

Description	2 N.C. & 2 N.O.	3 N.C. & 1 N.O.																																				
Contact Configuration																																						
Contact Action	<p>□ Open ■ Closed</p>																																					
8-Pin Micro (M12)	—																																					
12-Pin m23 QD																																						
Pin 11 is not connected.	<table border="1"> <tr> <td>1 and 3</td> <td>Solenoid power</td> <td>Solenoid power</td> </tr> <tr> <td>4 and 6</td> <td>Safety A</td> <td>Safety A</td> </tr> <tr> <td>7 and 8</td> <td>Safety B</td> <td>Safety B</td> </tr> <tr> <td>2 and 5</td> <td>Aux A</td> <td>Safety C</td> </tr> <tr> <td>9 and 10</td> <td>Aux B</td> <td>Aux A</td> </tr> <tr> <td>12</td> <td>Ground</td> <td>Ground</td> </tr> </table>	1 and 3	Solenoid power	Solenoid power	4 and 6	Safety A	Safety A	7 and 8	Safety B	Safety B	2 and 5	Aux A	Safety C	9 and 10	Aux B	Aux A	12	Ground	Ground	<table border="1"> <tr> <td>1 and 3</td> <td>Solenoid power</td> <td>Solenoid power</td> </tr> <tr> <td>4 and 6</td> <td>Safety A</td> <td>Safety A</td> </tr> <tr> <td>7 and 8</td> <td>Safety B</td> <td>Safety B</td> </tr> <tr> <td>2 and 5</td> <td>Aux A</td> <td>Safety C</td> </tr> <tr> <td>9 and 10</td> <td>Aux B</td> <td>Aux A</td> </tr> <tr> <td>12</td> <td>Ground</td> <td>Ground</td> </tr> </table>	1 and 3	Solenoid power	Solenoid power	4 and 6	Safety A	Safety A	7 and 8	Safety B	Safety B	2 and 5	Aux A	Safety C	9 and 10	Aux B	Aux A	12	Ground	Ground
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9 and 10	Aux B	Aux A																																				
12	Ground	Ground																																				

Description		2 N.C. & 2 N.O.	3 N.C. & 1 N.O.
8-Pin Cordset 889D-F8AB-x ⁽¹⁾	Brown Blue	—	Solenoid power
	Grey Red	—	Safety A
	Yellow Pink	—	Safety B
	White Green	—	Aux A
12-Pin Cordset 889M-F12AH-x ⁽¹⁾	Brown Grey	Solenoid Power	Solenoid Power
	Pink Yellow	Safety A	Safety A
	White Red/Blue	Safety B	Safety B
	Blue Red	Aux A	Safety C
	Black Violet	Aux B	Aux A
	Green	Ground	Ground
Grey/pink not connected.			

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

Table 5 - Diagnostic Version

Actuator	LED Output Matrix	
	Solenoid Off	Solenoid On
In	Green	Amber
Out	Flashing red	Red

Table 6 - Diagnostic Electrical Output

Actuator	Voltage
In	0V DC
Out	+24V DC

Electrical output independent of solenoid status. Maximum output is 100 mA.

440G-S Spartan Guard Locking Switches

The 440G-S Spartan guard locking switches have the following features:

- Type 2 interlock with guard locking and low coding
- Power to release
- Lid mounted status indication
- Rotatable head: 4 possible key entry slots
- A catch kit with actuator alignment protects the unit from actuator damage due to poor guard alignment
- Manual release points with security screws or special key allow the switch to be unlocked in the event of an unforeseen and uncommon circumstance, such as a power failure




Specifications

Attribute	Value
Safety ratings	
Standards	ISO 14119, IEC 60947-5-1
Safety Classification	Type 2 interlocking device with guard locking and low coding per ISO 14119
Functional Safety	https://literature.rockwellautomation.com/idc/groups/literature/documents/sr/safety-sr001_-en-e.pdf
Certifications	cULus Listed, TÜV Certified, and CE Marked for all applicable directives www.rockwellautomation.com/certification/overview.page
Outputs	
Safety Contacts	2 N.C. or 3 N.C. direct opening action
Auxiliary Contacts	1 N.O.
Thermal Current (I _{th})	10A
Insulation Voltage	500V
Impulse withstand Voltage	2500V
Utilization Category	AC 15
AC (U _e)	500V 250V 100V
(I _e)	1A 2A 5A
DC	250V/0.5A 24V/2A
Maximum Switched Current/Volt/Load	500V/500VA
Min Current	5V 5mA DC
Safety Contact Gap	>2mm
Solenoid Characteristics	
Holding force F _{max}	1000 N (225 lb)
Holding force F _{zh}	770 N (173 lb)
Power Supply	24V AC/DC, 110V AC, 230V AC (solenoid)
Solenoid Power	Typically 7W 100% ED
Operating Characteristics	
Max Actuation Speed	160 mm per second (6.3 in. per sec)
Max Actuation Frequency	1 cycle per second
Mechanical Life	1,000,000 operations

Environmental	
Pollution Degree ⁽¹⁾	3
Operating Temperature	-20°C...+60°C (-4°F ... +140°F)
Protection	IP 67
Attribute	Value
Physical Characteristics	
Case Material	UL Approved glass filled polyester
Actuator Material	Stainless steel
Conduit Entry	1 x M20 or quick disconnect style
Fixing	2 x M5
Mounting	Any position
Electrical Life	1,000,000 operations
Weight	260 g (0.57 lb)
Color	Red
Min Operating Radius	175 mm (6.9 in.)
LED Indication	Solenoid monitor LED



(1) Conductive pollution occurs, or dry, non conductive pollution occurs which becomes conductive due to condensation.

Product Selection

Actuator	Solenoid Voltage	Contacts		Cat. No.		
		Safety	Aux.	M20 Conduit	M20 Conduit/ 1/2in Adaptor	Quick Disconnect
Standard	24 V AC/DC	2 N.C.	1 N.O.	440G-S36001	440G-S36044	440G-S36058
		3 N.C.	–	440G-S36007	440G-S36047	40G-S36059
	110 V AC/DC	2 N.C.	1 N.O.	440G-S36003	440G-S36045	440G-S36060
		3 N.C.	–	440G-S36009	440G-S36048	440G-S36061
	230V AC/DC	2 N.C.	1 N.O.	440G-S36005	440G-S36046	440G-S36062
		3 N.C.	–	440G-S36011	–	440G-S36063
	Mating cable					889M-F12X9AE-x ⁽¹⁾

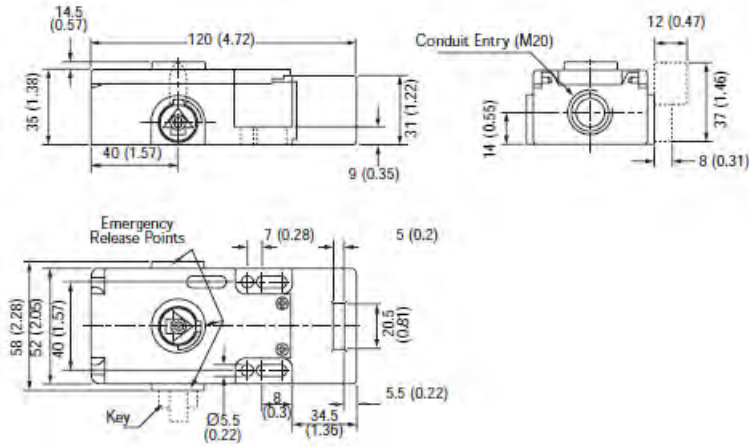
(1) Replace x with 2 (2 m), 5 (5 m), or 10 (10 m) for standard cable lengths.

Accessories

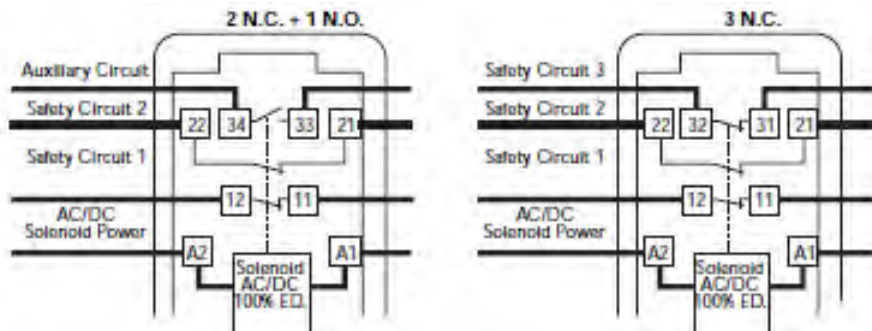
Description	Catalog Number
 Replacement Actuator with Catch Retainer and Guide	440G-A36050
 Manual Release Key	440G-A36026

Approximate Dimensions

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



Typical Wiring Diagrams

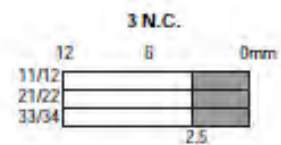
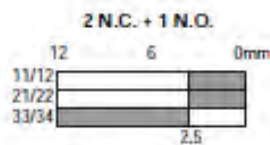


Connector Pinout		2 N.C. + 1 N.O.		3 N.C.	
		Terminal	Contact	Terminal	Contact
	1	A1	Solenoid	A1	Solenoid
	3	A2	Power	A2	Power
	4	11	N.C.	11	N.C.
	6	12	N.C.	12	N.C.
	7	21	N.C.	21	N.C.
	8	22	N.C.	22	N.C.
	9	33	N.O.	31	N.C.
	19	34	N.O.	32	N.C.

Contact Action

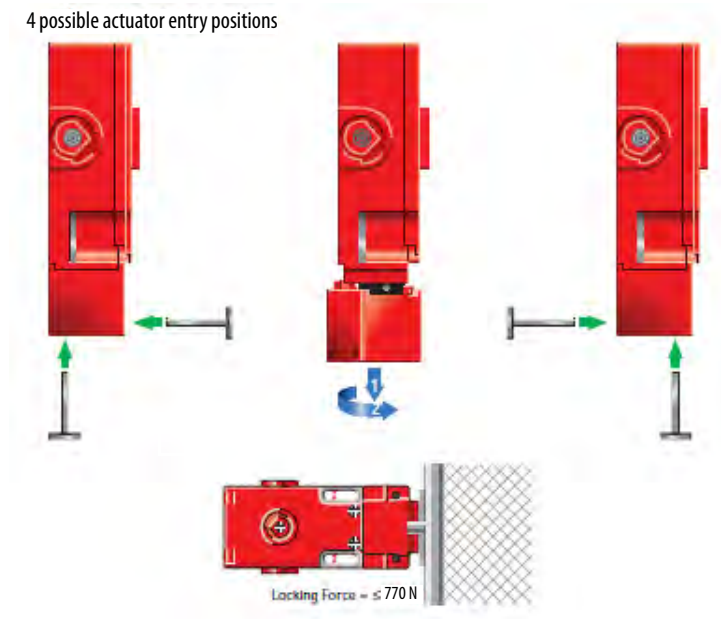
Contact Open Contact Closed

Actuator withdrawal distance from full insertion



Application Details

4 possible actuator entry positions



TLS-GD2 Guard Locking Switches

The TLS-GD2 guard locking switches have the following features:

- Power-to-release or power-to-lock
- High locking force ≤ 2000 N (450 lbf)
- Five contacts: 2 N.C. & 1 N.O. for door position monitoring 1 N.C. & 1 N.O. or 2 N.C. for lock monitoring
- Rotatable head: 4 possible key entry slots
- Conforms to ISO 14119 and IEC 60947-5-1
- Escape release version available
- IP69K, suitable for high pressure, high temperature washdown



Specifications

Attribute	Value			
Safety ratings				
Standards	ISO 14119, IEC 60947-5-1			
Safety classification	Type 2 interlocking device with guard locking and low coding (tongue) per ISO 14119			
Functional safety	Visit https://literature.rockwellautomation.com/idc/groups/literature/documents/sr/safety-sr001_-en-e.pdf			
Certifications	cULus Listed, TÜV Certified, and CE Marked for all applicable directives www.rockwellautomation.com/certification/overview.page			
Outputs				
Safety contacts ⁽¹⁾	(TLS-1 & -2) 3 N.C. direct opening action (TLS-3) 4 N.C. direct opening action			
Auxiliary contacts	(TLS-1 & -2) 2 N.O. (1 solenoid monitoring) (TLS-3) 1 N.O.)			
Thermal current/ I_{th}	10 A			
Rated insulation voltage (Ui)	500V			
Switching current @ voltage, min	3 mA @ 18V DC			
Utilization category				
A600/AC-15 (Ue)	600V	500V	240V	120V
A600/AC-15 (Ie)	1.2 A	1.4 A	3 A	6 A
DC-13 (Ue)	24V			
DC-13 (Ie)	2 A			
Solenoid characteristics				
Locking type				
Holding force F_{max} (ISO 14119)	Plastic pins: 1950 N (488 lbf) Steel bolts: 2600 N (585 lbf)			
Holding force F_{zh} (ISO 14119)	Plastic pins: 1500 N (337 lbf), Steel bolts: 2000 N (450 lbf)			
Power supply	24V AC/DC or 110V AC or 230V AC (solenoid)			
Solenoid power	7 W typical 100% ED			
Escape release button	Force max: 50 N (11.25 lbf)			
Operating characteristics				
Break contact force, min	20 N (4.5 lbf)			
Actuation Speed, max	160 mm (6.29 in.)/s			

Attribute	Value
Actuation frequency, max	1 cycle/s
Operating radius, min	160 mm (6.3 in.) [80 mm (3.15 in.) with flexible actuator]
Mechanical life	1,000,000 operations
Environmental	
Enclosure type rating	IP66, IP67, IP69K
Operating temperature	-20...+60 °C (-4...+140 °F)
Physical characteristics	
Housing material	UL Approved glass-filled PBT
Actuator material	Stainless steel
Weight [g (lb)]	400 (0.88)
Color	Red

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

Product Selection

Type	Contacts		Solenoid		Actuator Type	Cat. No.							
	Safety	Auxiliary	Contacts	Voltage		Conduit		Connector ⁽¹⁾					
						M20	1/2 inch NPT Adaptor	12-Pin M23	8-Pin Micro (M12) ⁽²⁾				
TLS-1 GD2 Power to Release	2 N.C.	1 N.O.	1 N.C. & 1 N.O.	24V AC/DC	—	440G-T27121	—	440G-T27233	440G-T2NBBPH-1R				
					GD2 Standard	440G-T27251	440G-T27169	440G-T27234	—				
					Fully flexible	440G-T27252	440G-T27171	440G-T27235	—				
				110V AC/DC	—	440G-T27124	—	—	—	—			
					GD2 Standard	440G-T27253	440G-T27172	—	—	—			
					Fully flexible	440G-T27254	440G-T27174	—	—	—			
				230V AC/DC	—	440G-T27123	—	—	—	—			
				TLS-2 GD2 Power to Lock	2 N.C.	1 N.O.	1 N.C. & 1 N.O.	24V AC/DC	—	440G-T27127	—	440G-T27239	440G-T2NBBPH-1L
									GD2 Standard	440G-T27255	440G-T27175	440G-T27240	—
Fully flexible	440G-T27256	440G-T27177	440G-T27241						—				
110V AC/DC	—	440G-T27132	—					—	—	—			
	GD2 Standard	440G-T27257	440G-T27178					—	—	—			
	Fully flexible	440G-T27258	440G-T27180					—	—	—			
230V AC/DC	—	440G-T27129	—					—	—	—			
TLS-3 GD2 Power to Release	2 N.C.	1 N.O.	2 N.C.					24V AC/DC	—	440G-T27134	—	440G-T27245	440G-T2NBBPH-2R
									GD2 Standard	440G-T27259	440G-T27181	440G-T27246	—
				Fully flexible	440G-T27260	440G-T27183	440G-T27247		—				
				110V AC/DC	—	440G-T27138	—	—	—	—			
					GD2 Standard	440G-T27261	440G-T27184	—	—	—			
					Fully Flexible	440G-T27262	440G-T27186	—	—	—			
				230V AC/DC	—	440G-T27136	—	—	—	—			
				TLS-1 GD2 Power to Release with Escape Release	2 N.C.	1 N.O.	1 N.C. & 1 N.O.	24V AC/DC	—	440G-T21BNPM-1B	440G-T21BNPT-1B	440G-T21BNPL-1B	440G-T2NBNPH-1B
									GD2 Standard	440G-T21BGPM-1B	440G-T21BGPT-1B	440G-T21BGPL-1B	—
—	440G-T21BNPM-4B	440G-T21BNPT-4B	—						—				
110V AC/DC	—	440G-T21BNPM-4B	440G-T21BGPT-4B					—	—				
	GD2 Standard	440G-T21BGPM-4B	440G-T21BGPT-4B					—	—				
	—	440G-T21BNPM-4B	440G-T21BGPT-4B					—	—				

Type	Contacts		Solenoid		Actuator Type	Cat. No.			
	Safety	Auxiliary	Contacts	Voltage		Conduit		Connector ⁽¹⁾	
						M20	1/2 inch NPT Adaptor	12-Pin M23	8-Pin Micro (M12) ⁽²⁾
TLS-3 GD2 Power to Release with Escape Release	2 N.C.	1 N.O.	2 N.C.	24V AC/DC	—	440G-T21BNPM-2B	440G-T21BNPT-2B	440G-T21BNPL-2B	440G-T21BNPH-2B
					GD2 Standard	440G-T21BGPM-2B	440G-T21BGPT-2B	440G-T21BGPL-2B	—
				110V AC/DC	—	440G-T21BNPM-5B	440G-T21BNPT-5B	—	—
					GD2 Standard	440G-T21BGPM-5B	440G-T21BGPT-5B	—	—

- (1) For connector ratings, see [Table 4](#).
- (2) With an 8-pin micro connector, not all contacts are connected. See [Typical Wiring Diagrams](#) on page 24 for wiring details.








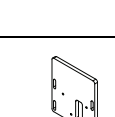
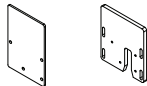
Table 7 - Connection Systems

Description	8-Pin Micro (M12)	12-Wire, 12-Pin M23	9-Wire, 12-Pin M23 ⁽⁴⁾
Cordset	889D-F8AB-x ⁽¹⁾	889M-F12AH-x ⁽¹⁾	889M-F12X9AE-x ⁽¹⁾
Patchcord	889D-F8ABDM-y ⁽²⁾	889M-F12AHMU-z ⁽³⁾	—

- (1) Replace x with 2 (2 m), 5 (5 m), or 10 (10 m) for standard cable lengths.
- (2) Replace y with 1 (1 m), 2 (2 m), 3 (3 m), 5 (5 m), or 10 (10 m) for standard cable lengths.
- (3) Replace z with 0M3, (0.3 m), 0M6 (0.6 m), 1 (1 m), 2 (2 m), or 3 (3 m) for standard lengths.
- (4) The 9-wire cordset can be used only with the TLS3 versions.

Accessories

Description	Cat. No.	
 GD2 standard actuator	440G-A27011	
 GD2 flat actuator	440K-A11112	
 Extended flat actuator	440K-A17116	
 Fully flexible actuator	440G-A27143	
 Sliding bolt actuator not to be used with the TLS1 Escape Release	440G-A27163	
 Emergency override key (See Warning below.)	440G-A36026	
	Flexible release—1 m (3.28 ft) cable	440G-A27356
	Flexible release—3 m (9.84 ft) cable	440G-A27357
 Dust cover	440K-A17183	
 Sliding bolt	440K-AMDS	

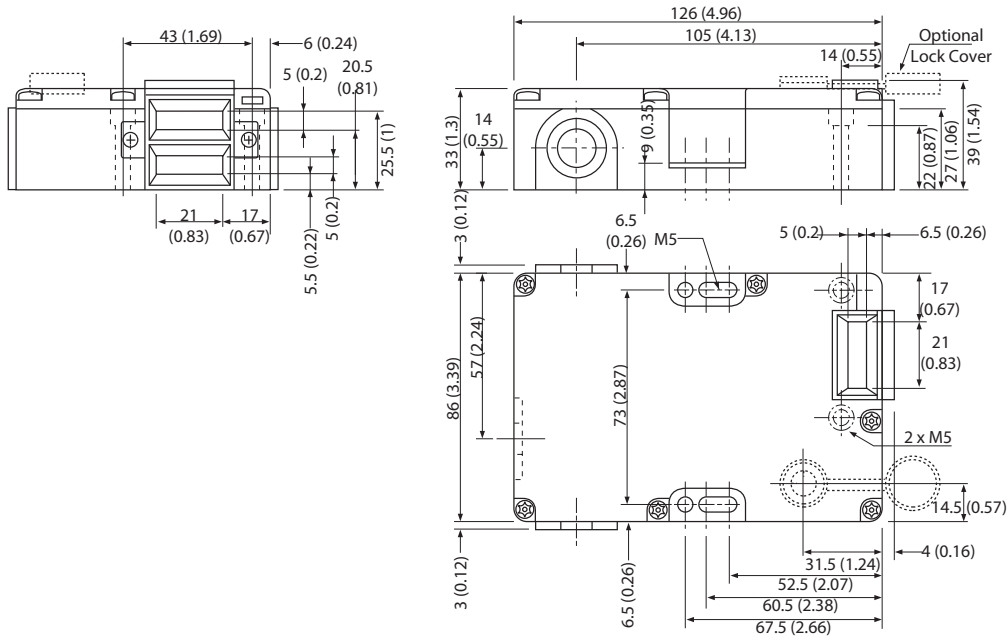
Description	Cat. No.
 Cover for TLS-1 with external override key for series D and earlier	440G-A27140
 Cover for TLS-3 with external override key for series D and earlier	440G-A27142
 Cover for TLS-1 with override key attached for series D and earlier	440G-A27207
 Cover for TLS-3 with override key attached for series D and earlier	440G-A27208
 Cover for TLS-1 with external override key for series E and later	440G-A27371
 Cover for TLS-3 with external override key for series E and later	440G-A27372
 Cover for TLS-1 with override key attached for series E and later	440G-A27373
 Cover for TLS-3 with override key attached for series E and later	440G-A27374
 Mounting plate	440K-AMDSSMPB
—	—



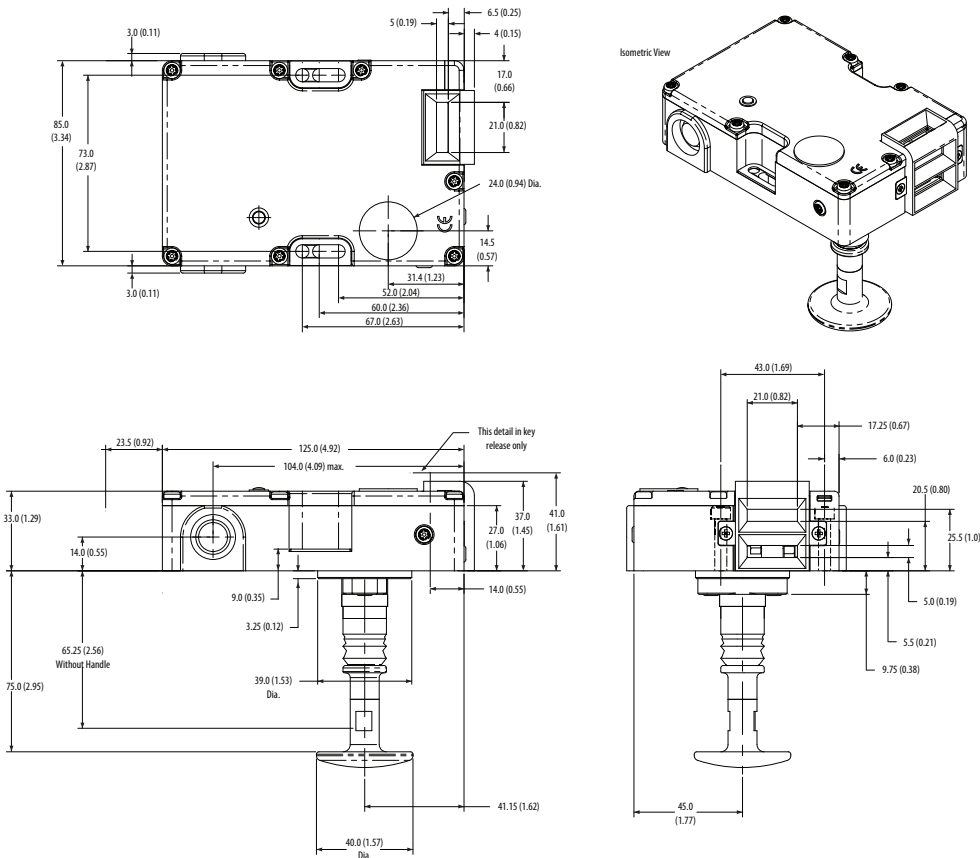
WARNING: Do not attach the Emergency Override Key to the TLS-GD2 switch.

Approximate Dimensions

Dimensions are shown in mm (in.). Dimensions are not intended to be used for installation purposes. 2D, 3D, and electrical drawings are available on <https://ab.rockwellautomation.com/>.



TLS-GD2 Escape Release



Typical Wiring Diagrams

Description		TLS1	TLS2	TLS3	
Contact Configuration		<p>Jumper between 12 & 41 and 22 & 51</p>		<p>Jumper between 12 & 41 and 22 & 51</p>	
Contact Action		<p>BBM</p>	<p>BBM</p>	<p>BBM</p>	
8-Pin Micro (M12)		<p>No jumper on 12-41</p>		<p>Jumper on 12-41 and 22-51</p>	
12-Pin M23		1 and 3	Solenoid Power	1 and 3	Solenoid Power
		4 and 12	Safety A ⁽²⁾	4 and 12	Safety A ⁽²⁾
		7 and 8	Safety B	7 and 5	Safety B ⁽²⁾
		9 and 10	Aux A	9 and 10	Aux A
		6 and 11	Solenoid A ⁽²⁾	6 and 11	Solenoid A ⁽²⁾
		2 and 5	Solenoid B	2 and 8	Solenoid B ⁽²⁾
8-Pin Cordset 889D-F8AB-x ⁽¹⁾	Brown Blue	Solenoid power		Solenoid power	
	Grey Red	Safety A		Safety A & Solenoid A	
	Yellow Pink	Safety B		Safety B & Solenoid B	
	White Green	Solenoid A		Solenoid A	
12-Pin, 9-Wire Cordset 889M-F12X9AE-x ⁽¹⁾	Can not be used.		Brown Blue		Solenoid Power
White Green			Safety A & Solenoid A		
Yellow Grey			Safety B & Solenoid B		
Pink Red			Aux A		
Pink/Yellow: Not connected					

Description	TLS1	TLS2	TLS3	
12-Pin, 12-Wire Cordset 889M-F12AH-x ⁽¹⁾	Brown Grey	Solenoid Power	Brown Grey	Solenoid Power
	Pink Green	Safety A ⁽²⁾	Pink Green	Safety A ⁽²⁾
	White Red/Blue	Safety B	White Red	Safety B ⁽²⁾
	Black Violet	Aux A	Black Violet	Aux A
	Grey/Pink Yellow	Solenoid A ⁽²⁾	Grey/Pink Yellow	Solenoid A ⁽²⁾
	Blue Red	Solenoid B	Blue Red/Blue	Solenoid B ⁽²⁾

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

(2) See warning statements.



WARNING: To monitor independently the safety contact(s) and the solenoid feedback (TLS 1, 2, and 3):

- The 12-wire cordset 889M-F12AH-footnote must be used
- AND
- For the TLS1 and TLS2: the jumper between 12 and 41 must be removed
 - For the TLS3: the jumpers between 12 and 41 and 22 and 51 must be removed



WARNING: Monitoring of safety contact(s) and the solenoid feedback (in series) is available, when jumpers are in place:

- AND
- For the TLS1 and TLS2: by using pins 4 and 6 on the 12-pin, M23 receptacle or Pink and Yellow wires on the 12-wire cordset (889M-F12AH-x⁽¹⁾)
 - For the TLS3: by using pins 4 and 6 and pins 7 and 8 on the 12-pin, M23 receptacle or Pink and Yellow and White and Red/Blue wires on the 12-wire cordset (889M-F12AH-x⁽¹⁾)

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

TLS-Z GD2 Guard Locking Switches

The TLS-ZR GD2 and the TLS-ZL GD2 guard locking switches have the following features:

- Meets PLe to ISO 13849-1
- Solid-state OSSD outputs series connectable to ISO 14119
- RFID uniquely coded door target
- Easy QD connection
- Same mechanical arrangement as standard TLS-GD2
- High locking force ≤ 2000 N (450 lbf)

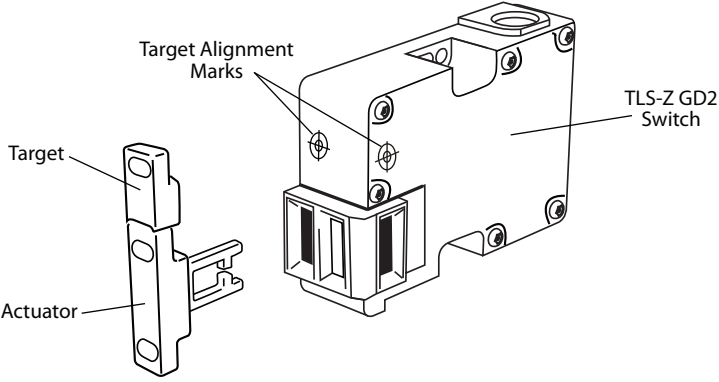


Specifications




Attribute	Value
Safety ratings	
Standards	ISO 14119, IEC 60947-5-3, ISO 13849-1
Safety classification	Type 4 interlocking device with guard locking per ISO 14119 with high (unique) coding per ISO 14119 PLe Cat 4 per ISO 13849-1
Functional safety	Visit https://literature.rockwellautomation.com/idc/groups/literature/documents/sr/safety-sr001_-en-e.pdf
Certifications	cULus Listed, TÜV Certified, and CE Marked for all applicable directives www.rockwellautomation.com/certification/overview.page
Outputs (guard door closed and locked)	
Safety outputs	2 x PNP, 0.2 A max, status: ON (+24V DC)
Auxiliary outputs	1 x PNP, 0.2 A max, status: OFF (0V DC)
Operating characteristics	
TLSZR-GD2	Power to release
TLSZL-GD2	Power to lock
Assured locking distance [mm (in.)]	Max door target distance: 13 (0.51), max clearance between actuator base and switch in door-closed position: 5 mm
Torque for M5 mounting	1.4 N·m (12.39 lbf·in)
Torque for cover mounting	1.2 N·m (10.62 lbf·in)
Holding force F_{max} (ISO 14119)	Plastic pins: 1950 N (488 lbf) Steel bolts: 2600 N (585 lbf)
Holding force F_{th} (ISO 14119)	Plastic pins: 1500 N (337 lbf), Steel bolts: 2000 N (450 lbf)
Output current, max (all outputs)	200 mA
Current consumption	50 mA — Solenoid not energized (no load supply current); 120 mA (260 mA inrush) — Solenoid energized (no load supply current); <0.5 mA DC — Off state
Solenoid duty cycle	100%
Maximum number of switches, connected in series	Unlimited
Operating voltage U_e	24V DC +10%/-15% Class 2
Operating frequency	1 Hz
Actuation speed, max	160 mm (6.29 in.) per second
Actuation speed, min	100 mm (3.94 in.) per minute
Response time	75 ms 1st switch, 25 ms each additional switch (Off)
Utilization category	DC-13 24V 200 mA (IEC 60947-5-2)
Rated impulse withstand voltage	250V




Attribute	Value
Pollution degree	3
Protection Type	2
Mechanical life	1,000,000 operations
Actuation speed, max	160 mm (6.29 in.) per second
Operating radius (only for use with flexible actuator)	80 mm (3.15 in.)
Environmental	
Enclosure type rating	NEMA 3, 4X, 12, 13; IP66, IP69K
Operating temperature	-10...+60 °C (14...140 °F)
Relative humidity	5...95%
Shock and vibration	IEC 60068-2-27 30 g, 11 ms/IEC 60068-2-6 10...55 Hz, 1 mm
Frequency	IEC 61000-4-3, IEC 61000-4-6
Physical characteristics	
Housing material	UL Approved glass-filled PBT
Actuator material	Stainless Steel
Target type	UL Approved glass-filled PBT
Weight [g (lb)]	400 (0.88)
Color	Red

Product Selection

Description	Cat. No.
 <p>The diagram illustrates the TLS-Z GD2 Switch assembly. It features a main rectangular housing labeled 'TLS-Z GD2 Switch'. On the front face, there are 'Target Alignment Marks' and a 'Target' component. An 'Actuator' is shown on the side, designed to engage with the switch mechanism. The target and actuator are shown in a separate view to the left of the main housing.</p>	TLS-ZR GD2 guard locking switch OSSD outputs power-to-release QD 24V
	TLS-ZL GD2 guard locking switch OSSD outputs power-to-lock QD 24V
	440G-TZS21UPRH
	440G-TZS21UPLH

Accessories

Description		Cat. No.
 Target	Spare RFID door target	440G-ATZA
	Fully flexible actuator	440G-A27143
	Cover for TLS-1 with external override key for series E and later	440G-A27371
	Cover for TLS-1 with override key attached for series E and later	440G-A27373

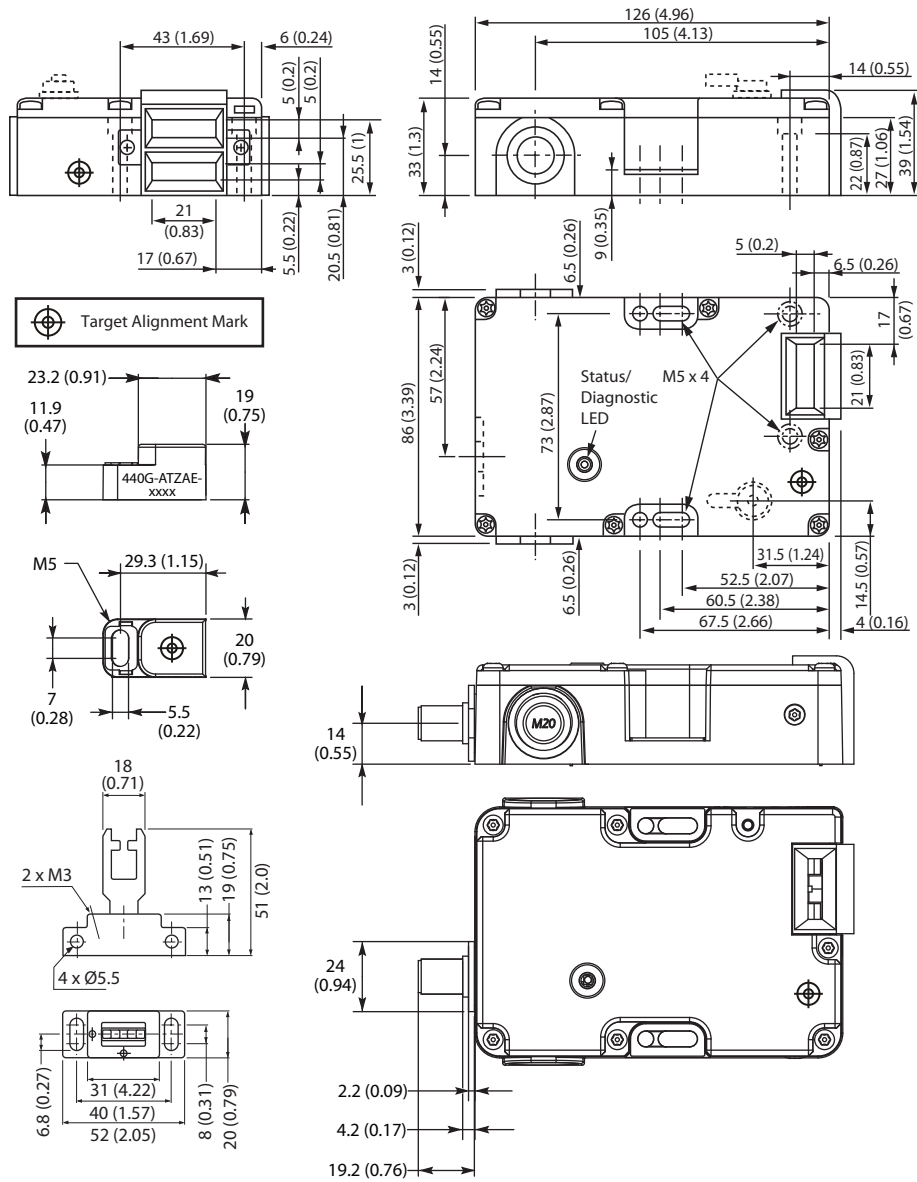
	Emergency override key (See Warning below.)	440G-A36026
	Flexible release—1 m (3.28 ft) cable	440G-A27356
	Flexible release—3 m (9.84 ft) cable	440G-A27357
	Dust cover	440K-A17183



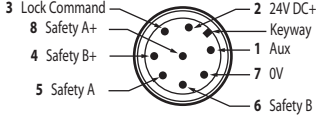
WARNING: Do not attach the Emergency Override Key to the TLS-Z-GD switch.

Approximate Dimensions

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



Typical Wiring Diagrams

8-Pin Micro (M12)			
8-Pin Cordset 889D-F8AB-x⁽¹⁾ or cable version	Color	Function	Pin
	White	Aux	1
	Brown	24V DC +	2
	Green	Lock	3
	Yellow	Safety B+	4
	Grey	Safety A	5
	Pink	Safety B	6
	Blue	Gnd/0V	7
	Red	Safety A+	8

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

Atlas 5 Guard Locking Switches

The Atlas™ 5 guard locking switches have the following features:

- Type 2 interlocking device with guard locking and low coding per ISO 14119
- High Fzh (holding force): 3850 N (865 lb)
- Mechanical lock (power to release)
- Heavy-duty, die-cast alloy housing for use in harsh environments
- Patented self-aligning head tolerates actuator misalignment



Specifications

Attribute	Value	
Safety ratings		
Standards	ISO 14119, IEC 60947-5-1	
Safety classification	Type 2 interlocking device with guard locking and low coding per ISO 14119	
Functional safety	Visit https://literature.rockwellautomation.com/idc/groups/literature/documents/sr/safety-sr001_en-e.pdf	
Certifications	cULus Listed, TÜV Certified, and CE Marked for all applicable directives www.rockwellautomation.com/certification/overview.page	
Outputs		
Safety contacts	Atlas 5: 2 N.C. direct opening action; 1 N.O. direct opening action Atlas 5 trapped key (left hand): 2 N.C. direct opening action; 1 N.O. direct opening action	
Auxiliary contacts	1 N.O.	
Thermal current/ I_{th}	10 A	
Rated insulation voltage (Ui)	500V	
Switching current @ voltage, min	3 mA @ 18V DC	
Utilization category		
AC-15 (Ue)	240V	120V
AC-15 (Ie)	1.5 A	3 A
DC-13 (Ue)	24V	
DC-13 (Ie)	2 A	
Solenoid characteristics		
Locking type	Power to release	
Holding force F_{max}	5000 N (1124 lbf)	
Holding force F_{zh}	3850 N (865 lbf)	
Power supply	24V AC/DC or 110V AC or 230V AC (solenoid)	
Solenoid power	13 W typical 100% ED	
Operating characteristics		
Break contact force, min	12 N (2.7 lbf)	
Actuation speed, max	160 mm (6.29 in.)/s	
Actuation frequency, max	2 cycles/s	
Operating radius, min	300 mm end entry, 800 mm front entry	
Mechanical life	1,000,000 operations	

Attribute	Value
Environmental	
Enclosure type rating	IP65
Operating temperature	-10...+60 °C (+14...+140 °F)
Physical Characteristics	
Housing Material	Die-cast alloy
Actuator Material	Stainless steel
Weight [g (lb)]	1200 (2.65)
Color	Red

Product Selection

Module Type	Actuator Type	Contact		Solenoid Contacts	Solenoid Voltage	Cat. No.			
		Safety	Auxiliary			Conduit Entry ⁽¹⁾			
						M20	1/2 inch NPT Adapter	12-Pin M23 ⁽²⁾	8-Pin Micro (M12) ⁽²⁾
Standard	Standard	2 N.C.	1 N.O.	2 N.C. & 1 N.O.	24V AC/DC	440G-L07264	440G-L07258	440G-L07298	440G-L2NNSDH-3N
					110V AC/DC	440G-L07263	440G-L07257	—	—
					230V AC/DC	440G-L07262	440G-L07256	—	—
LH Key Lock					24V AC/DC	440G-L07255	440G-L07249	440G-L07301	440G-L2NNSDH-38
					110V AC/DC	440G-L07254	440G-L07248	—	—
					230V AC/DC	440G-L07253	440G-L07247	—	—

(1) For connector ratings, see Safety Switches and Connectors.

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

Table 8 - Connection Systems



Description	Cat. No.	
	8-Pin Micro (M12)	12-Pin M23
Cordset	889D-F8AB-x ⁽¹⁾	889M-F12AH-x ⁽¹⁾
Patchcord	889D-F8ABDM-y ⁽²⁾	889M-F12AHMU-z ⁽³⁾



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

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

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

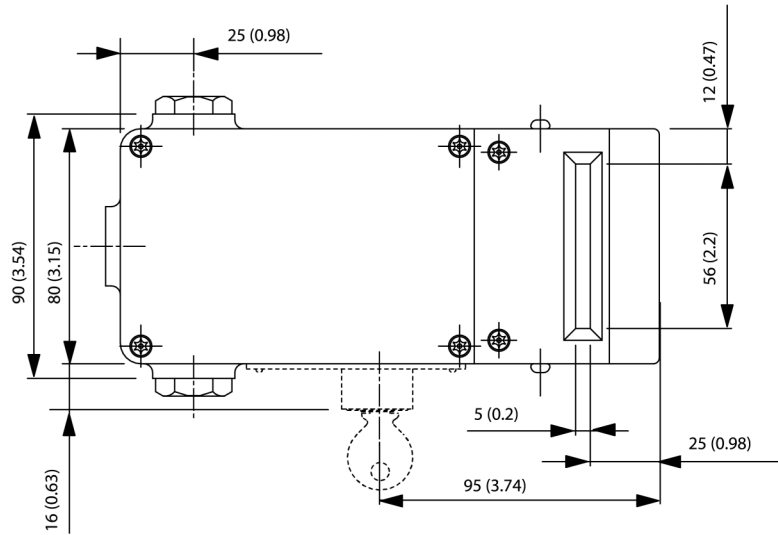
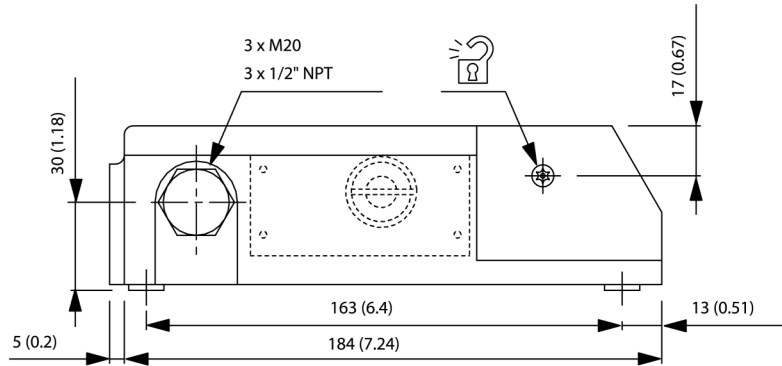
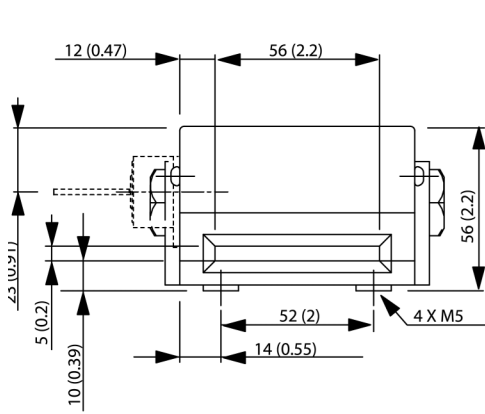
Accessories

Description	Cat. No.
 Standard actuator	440G-A07136
 Atlas replacement end cap	440G-A07180

 Fully flex actuator	440G-A07269
 Dust cover	440K-A17181

Approximate Dimensions

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



Typical Wiring Diagrams

Figure 1 - Contact Configuration

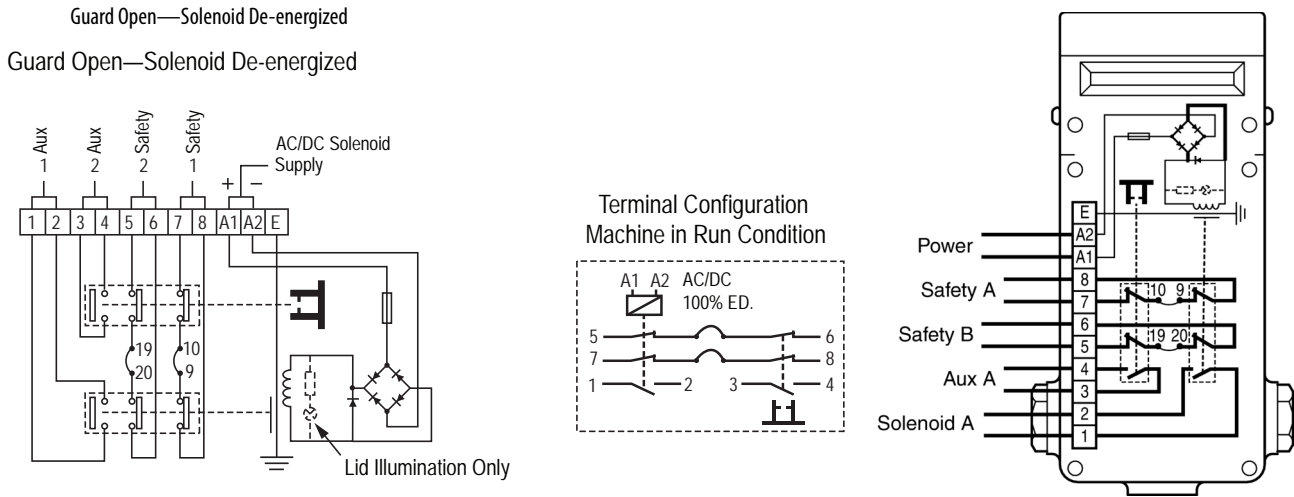


Figure 2 - Contact Action

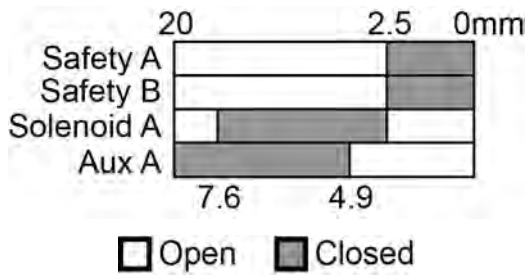
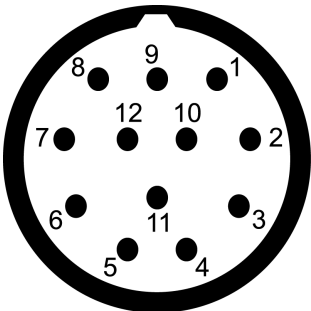


Table 9 - 8-Pin (M12) Cordset

889D-F8AB-x ⁽¹⁾	Pin	Color	Function
	1	White/Green	Solenoid A
	2	Brown/Blue	Power
	3	White/Green	Solenoid A
	4	Yellow/Pink	Safety B
	5	Grey/Red	Safety A
	6	Yellow/Pink	Safety B
	7	Brown/Blue	Power
	8	Grey/Red	Safety A

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

Table 10 - 12-Pin (M23) Cordset

	Pin	Color	Function
 <p>889M-F12AH-x⁽¹⁾</p>	1	Solenoid Power	Brown/Grey
	2	Auxiliary A	Blue/Red
	3	Solenoid Power	Brown/Grey
	4	Safety A	Pink/Yellow
	5	Auxiliary A	Blue/Red
	6	Safety A	Pink/Yellow
	7	Safety B	White/Red/Blue
	8	Safety B	White/Red/Blue
	9	Solenoid A	Black/Violet
	10	Solenoid A	Black/Violet
	11	Not Connected	—
	12	Ground	Green

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

Hinge Switches

Bulletin Number 440H

Topic	Page
Sprite Miniature Hinge Interlock Switches	36
Ensign 3 Hinge Interlock Switches	40
Rotacam Heavy-duty Hinge Interlock Switches	44

Sprite Miniature Hinge Interlock Switches

The Sprite miniature hinge interlock switches have the following features:

- Ideal for small, light-weight guards
- The smallest hinge interlock switch available, 75 x 25 mm case
- Degree of operation can be customized with adjustable cam
- Contacts, 2 N.C. or 1 N.C. & 1 N.O.
- Four possible shaft positions, easy to install



Specifications

Attribute	Value			
Safety ratings				
Standards	ISO 13849-1, IEC/EN60204-1, NFPA79, EN1088, ISO14119, IEC/EN60947-5-1, ANSI B11.19, AS4024.1			
Safety classification	May be suitable for use in Category 3 or Category 4 systems depending on the architecture and application characteristics.			
Functional Safety Data (related to Safety Contacts) ⁽¹⁾	B10d: > 2 x 10 ⁶ operations at minimum load PFH _D : < 3 x 10 ⁻⁷ MTTFd: > 385 years May be suitable for use in performance levels PLe or PLd systems (according to ISO 13849-1) and for use in SIL2 or SIL3 systems (according to IEC 62061) depending on the architecture and application characteristics			
Certifications	CE Marked for all applicable directives, c-UL-us, NRTL/C, and TÜV www.rockwellautomation.com/certification/overview.page			
Operating characteristics				
Break contact force, min	8 cN·m (torque on shaft)			
Actuation speed, max	160 mm (6.29 in.)/s			
Actuation frequency, max	1 cycle/s			
Mechanical life	1,000,000 operations			
Utilization category				
A600/AC-15 (Ue)	600V	500V	240V	120V
A600/AC-15 (Ie)	1.2 A	1.4 A	3 A	6 A
DC-13 (Ue)	24V	—	—	—
DC-13 (Ie)	2 A	—	—	—
Outputs				
Safety contacts ⁽²⁾	2 N.C. direct opening action		1 N.C. direct opening action	
Auxiliary contacts	—		1 N.O.	

Attribute	Value
Shaft rotation for contact operation	11° max, 3° min (adjustable)
Thermal current/ <i>I_{th}</i>	10A
Rated Insulation voltage Ui	500 V
Switching current @ voltage, min	3 mA @ 18V DC
Environmental	
Enclosure type rating	IP67
Operating temperature	-20...+80 °C (-4...+176 °F)
General	
Housing material	UL-approved glass-filled PBT
Actuator material	Stainless steel
Weight	80 g (0.176 lb)
Color	Red

- (1) Usable for ISO 13849-1 and IEC 62061. Data is based on the B10d value that is given and:
 Usage rate of 1op/10mins., 24hrs/day, 360 days/year, representing 51,840 operations per year.
 Mission time/Proof test interval of 38 years.
- (2) The safety contacts are described as normally closed (N.C.) for example: with the guard closed, actuator in place (where relevant) and the machine able to be started.

Product Selection

Contact		Action	Actuator Shaft Dimensions [mm (in.)]	Shaft Type	Cat. No.			
Safety	Auxiliary				M16 Conduit		Connector ⁽¹⁾ (M12)	
					M16	1/2 inch NPT Adapter	4-Pin Micro	Connect to ArmorBlock Guard I/O 5-Pin Micro
2 N.C.	—	—	80 x Ø10 (3.14 x 0.39)	Solid	440H-S34019	440H-S34023	440H-S34027	—
			60 x Ø8 (2.36 x 0.31)		440H-S34020	440H-S34024	440H-S34028	—
			50 x Ø10 (1.96 x 0.39)		440H-S34010	440H-S34017	440H-S34014	440H-S2NNPPS
			30 x Ø16 (1.18 x 0.63) bore Ø9.5 (0.37)	Pre-bored	440H-S34033	440H-S34034	440H-S34035	440H-S2NNHPS
1 N.C.	1 N.O.	BBM	80 x Ø10 (3.14 x 0.39)	Solid	440H-S34021	440H-S34025	440H-S34029	—
			60 x Ø8 (2.36 x 0.31)		440H-S34022	440H-S34026	440H-S34030	—
			50 x Ø10 (1.96 x 0.39)		440H-S34012	440H-S34018	440H-S34015	—
			30 x Ø16 (1.18 x 0.63) bore Ø9.5 (0.37)	Pre-bored	440H-S34036	—	—	—

(1) For connector ratings, see [Table 12](#).

Table 11 - Connection Systems

Description	4-Pin Micro (M12)		5-Pin Micro (M12) for ArmorBlock Guard I/O
	2 N.C.	1 N.C. & 1 N.O.	2 N.C.
Cordset	889D-F4AC-x ⁽¹⁾	889D-F4AC-x ⁽¹⁾	—
Patchcord	889D-F4ACDM-y ⁽²⁾	889D-F4ACDM-y ⁽²⁾	889D-F5ACDM-x ⁽¹⁾
Distribution Box	889D-4zLT-DM4 ⁽³⁾	898D-F4zKT-DM4 ⁽³⁾	—
Shorting Plug	889D-41LU-DM	898D-41KU-DM	—
T-Port	889D-43LY-D4	898D-43KY-D4	—

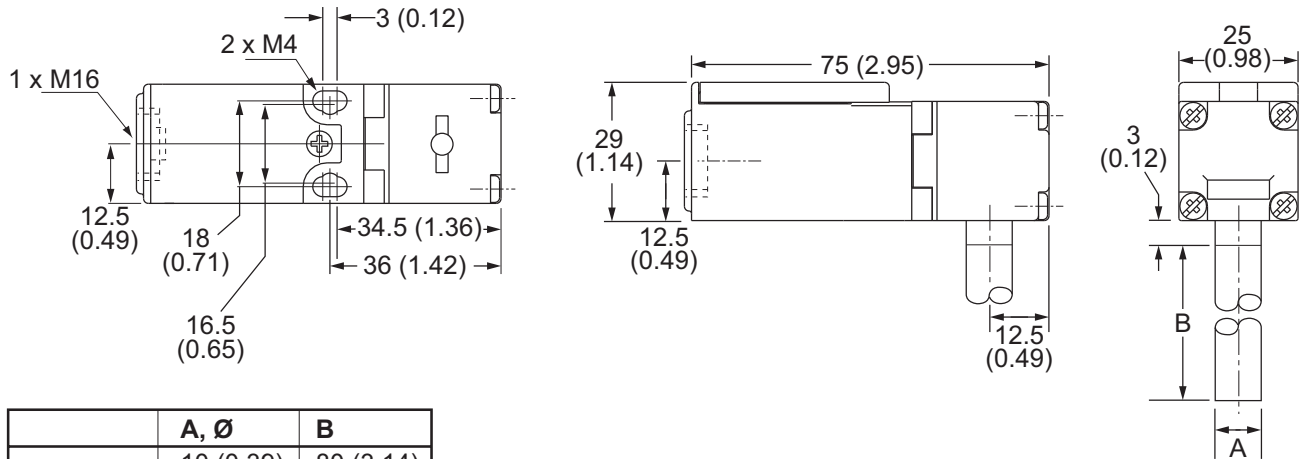
- (1) Replace x with 2 (2 m), 5 (5 m), or 10 (10 m) for standard cable lengths.
 (2) Replace y with 1 (1 m), 2 (2 m), 3 (3 m), 5 (5 m), or 10 (10 m) for standard cable lengths.
 (3) Replace z with 4 or 8 for number of ports.

Table 12 - Connector Ratings

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

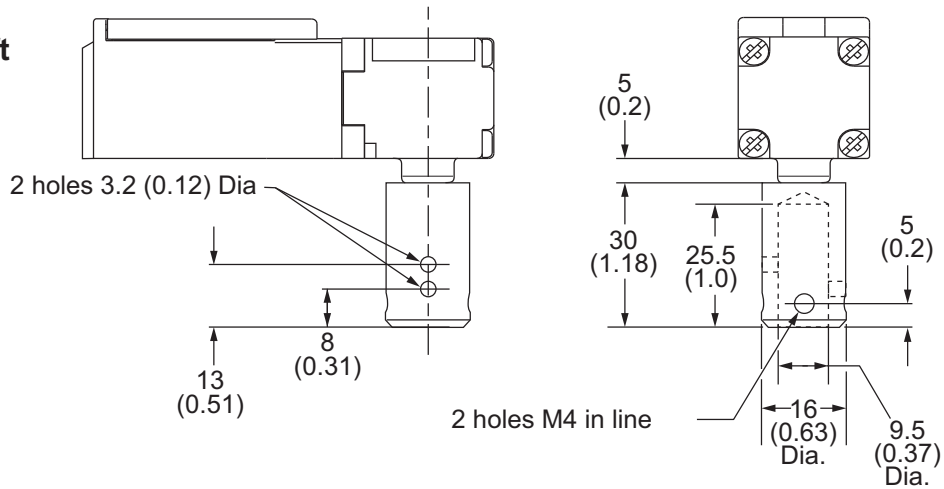
Approximate Dimensions

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



	A, Ø	B
mm (in.)	10 (0.39)	80 (3.14)
	8 (0.31)	60 (2.36)
	10 (0.39)	50 (1.96)

Hollow Shaft



Typical Wiring Diagrams

Figure 3 - Contact Configuration

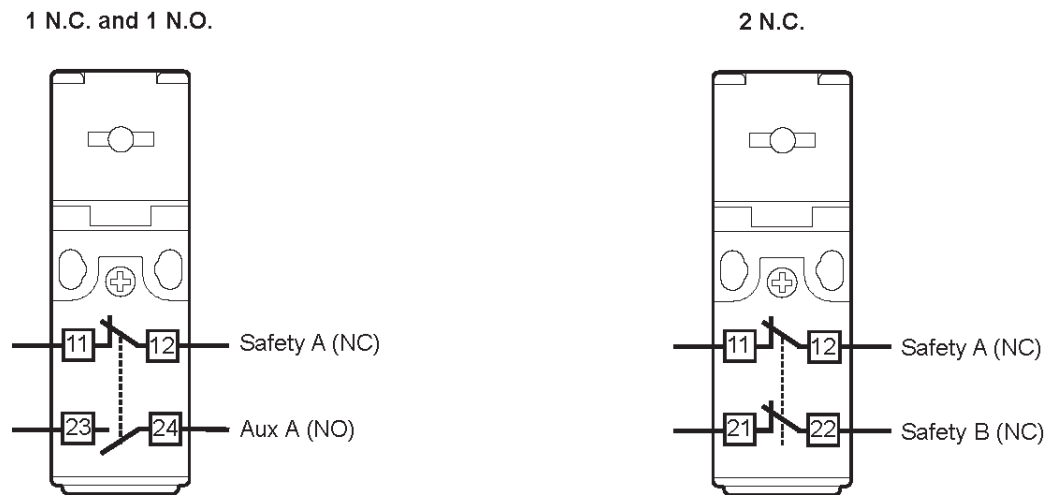


Figure 4 - Contact Action



Figure 5 - 4-Pin Micro (M12)

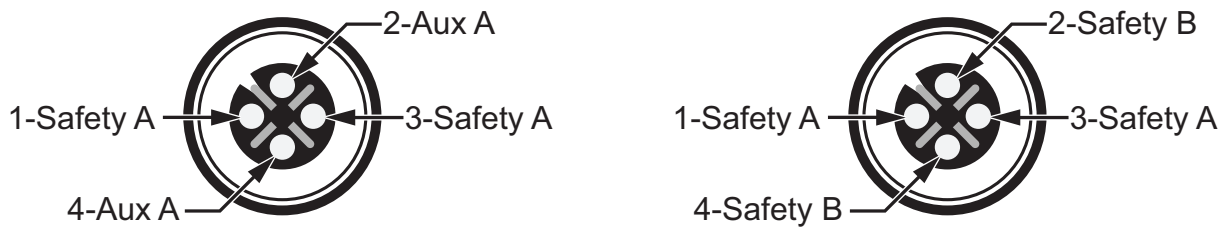


Table 13 - Cordset 889D-F4AC-x⁽¹⁾

Pin	Color	4-Pin	
1	Brown	Safety A	Safety A
2	White	Aux A	Safety B
3	Blue	Safety A	Safety A
4	Black	Aux A	Safety B

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

Ensign 3 Hinge Interlock Switches

The Ensign 3 hinge interlock switches have the following features:

- Compact size—90.5 x 31 x 30.4 mm (3.56 x 1.22 x 1.2 in.) housing
- Ideal for small, lightweight guards
- Degree of operation can be customized with adjustable cam
- Contacts, 2 N.C. & 1 N.O. or 3 N.C. (sealed to IP67)
- Four possible shaft positions, easy to install
- Solid and hollow shafts available



Specifications

Attribute	Value			
Safety ratings				
Standards	ISO 13849-1, IEC/EN60204-1, NFPA79, EN1088, ISO14119, IEC/EN60947-5-1, ANSI B11.19, AS4024.1			
Safety classification	Dual channel interlocks suitable for use in Category 3 or Category 4 systems.			
Functional Safety Data (related to Safety Contacts) ⁽¹⁾	B10d: > 2 x 10 ⁶ operations at minimum load PFH _d : < 3 x 10 ⁻⁷ MTTFd: > 385 years May be suitable for use in performance levels PLe or PLd systems (according to ISO 13849-1) and for use in SIL2 or SIL3 systems (according to IEC 62061) depending on the architecture and application characteristics			
Certifications	CE Marked for all applicable directives, c-UL-us, NRTL/C, and TÜV www.rockwellautomation.com/certification/overview.page			
Operating characteristics				
Break contact force, min	8 cNm (torque on shaft)			
Actuation speed, max	160 mm (6.29 in.)/s			
Actuation frequency, max	1 cycle/s			
Mechanical life	1,000,000 operations			
Utilization category				
A600/AC-15 (Ue)	600V	500V	240V	120V
A600/AC-15 (Ie)	1.2 A	1.4 A	3 A	6 A
DC-13 (Ue)	24V	—	—	—
DC-13 (Ie)	2 A	—	—	—
Outputs				
Safety contacts ⁽²⁾	3 N.C. direct opening action		2 N.C. direct opening action	
Auxiliary contacts	—		1 N.O.	
Shaft rotation for contact operation	3 N.C. 12° max, 3° min (adjustable) 2 N.C. 1 N.O. (BBM) 14° max, 5° min (adjustable) 2 N.C. 1 N.O. (MBB) 12° max, 3° min (adjustable)			
Thermal current/ <i>I_{th}</i>	10A			
Rated Insulation voltage U _i	500 V			
Switching current @ voltage, min	3 mA @ 18V DC			
Environmental				
Enclosure type rating	IP67			
Operating temperature	-20...+80 °C (-4...+176 °F)			
General				
Housing material	UL-approved glass-filled PBT			

Attribute	Value
Actuator material	Stainless steel
Weight	100 g (0.22 lb)
Color	Red

- (1) Usable for ISO 13849-1 and IEC 62061. Data is based on the B10d value that is given and:
 —Usage rate of 1op/10mins., 24hrs/day, 360 days/year, representing 51,840 operations per year.
 —Mission time/Proof test interval of 38 years.
- (2) The safety contacts are described as normally closed (N.C.) for example: with the guard closed, actuator in place (where relevant) and the machine able to be started.

Product Selection

Contact		Action	Actuator Shaft Dimensions [mm (in.)]	Shaft Type	Cat. No.			
Safety	Auxiliary				M20 Conduit		Connector ⁽¹⁾	
					M16	1/2 inch NPT Adapter	6-Pin Micro (M12)	Connect to ArmorBlock Guard I/O 5-Pin Micro ⁽²⁾
3 N.C.	—	—	80 x Ø10 (3.14 x 0.39)	Solid	440H-E22025	440H-E22050	440H-E22059	—
			60 x Ø8 (2.36 x 0.31)		440H-E22031	440H-E22051	440H-E22060	—
			50 x Ø10 (1.96 x 0.39)		440H-E22047	440H-E22052	440H-E22061	440H-E2NNPPS
			30 x Ø16 (1.18 x 0.63) bore Ø9.5 (0.37)	Pre-bored	440H-E22067	440H-E22068	440H-E22069	440H-E2NNHPS
2 N.C.	1 N.O.	BBM	80 x Ø10 (3.14 x 0.39)	Solid	440H-E22027	440H-E22053	440H-E22037	—
			60 x Ø8 (2.36 x 0.31)		440H-E22033	440H-E22054	440H-E22039	—
			50 x Ø10 (1.96 x 0.39)		440H-E22048	440H-E22055	440H-E22062	—
			30 x Ø16 (1.18 x 0.63) bore Ø9.5 (0.37)	Pre-bored	440H-E22064	440H-E22065	440H-E22066	—
		MBB	80 x Ø10 (3.14 x 0.39)	Solid	440H-E22029	440H-E22056	440H-E22038	—
			60 x Ø8 (2.36 x 0.31)		440H-E22035	440H-E22057	440H-E22040	—
			50 x Ø10 (1.96 x 0.39)		440H-E22049	440H-E22058	440H-E22063	—
			30 x Ø16 (1.18 x 0.63) bore Ø9.5 (0.37)	Pre-bored	440H-E22070	440H-E22071	440H-E22072	—

- (1) For connector ratings, see [Table 12](#).
- (2) With an 8-pin micro connector, not all contacts are connected. See [Typical Wiring Diagrams](#) on page 43 for wiring details.

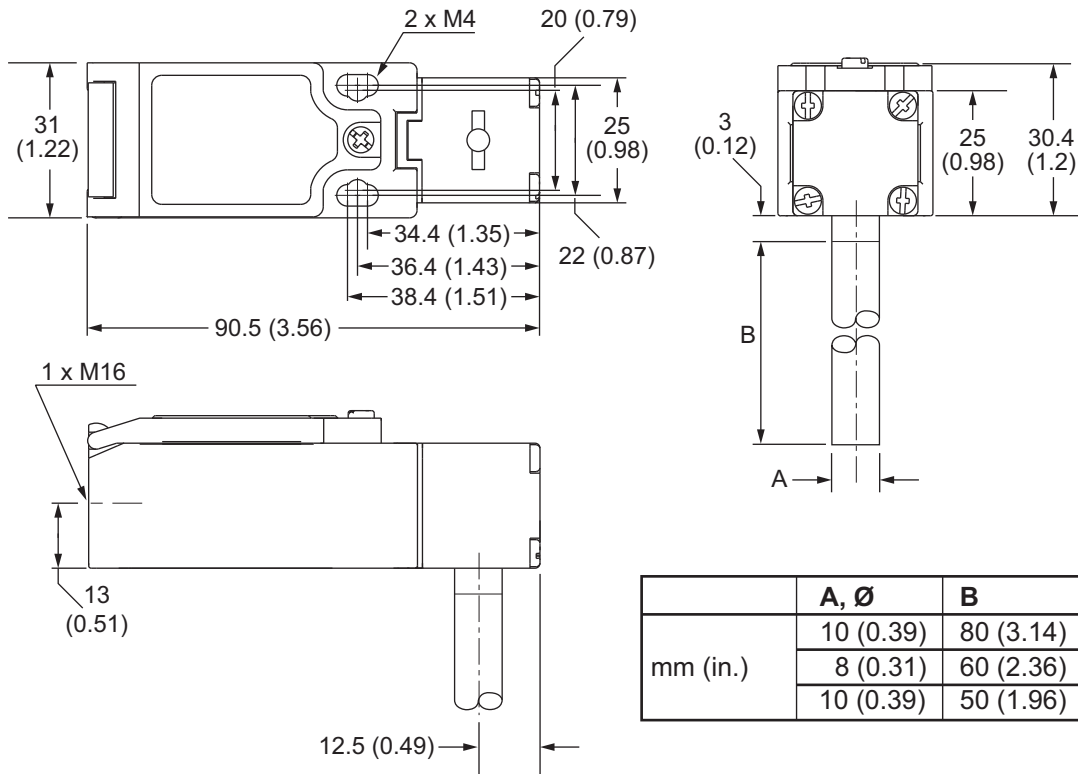
Table 14 - Connection Systems

Description	6-Pin Micro (M12)	5-Pin Micro (M12) for ArmorBlock Guard I/O
	3 N.C.-2 N.C. & 1 N.O	3 N.C.
Cordset	889R-F6ECA-x ⁽¹⁾	—
Patchcord	889R-F6ECRM-y ⁽²⁾	889D-F5ACDM-x ⁽¹⁾
Distribution Box	898R-P68MT-A5	—
Shorting Plug	898R-P61MU-RM	—

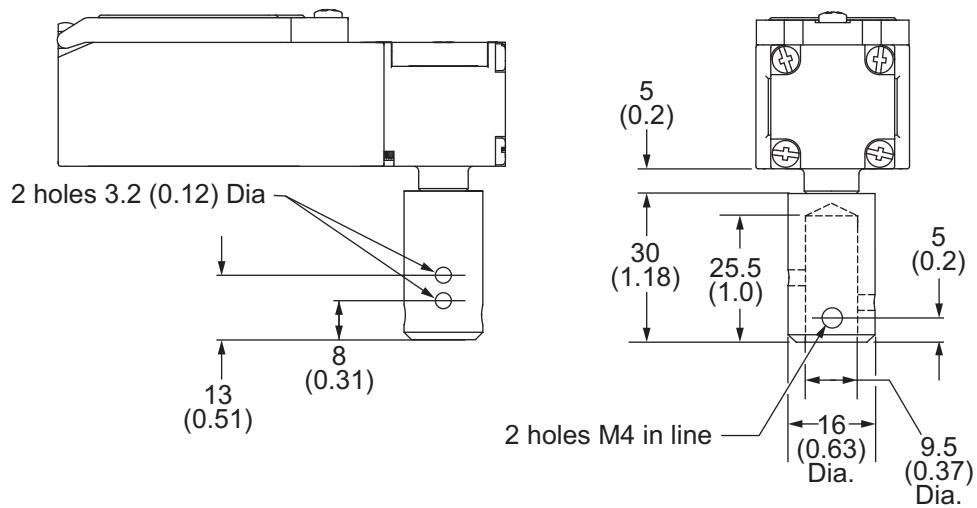
- (1) Replace x with 2 (2 m), 5 (5 m), or 10 (10 m) for standard cable lengths.
- (2) Replace y with 1 (1 m), 2 (2 m), 3 (3 m), 5 (5 m), or 10 (10 m) for standard cable lengths.

Approximate Dimensions

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



Hollow Shaft



Typical Wiring Diagrams

Figure 6 - Contact Configuration

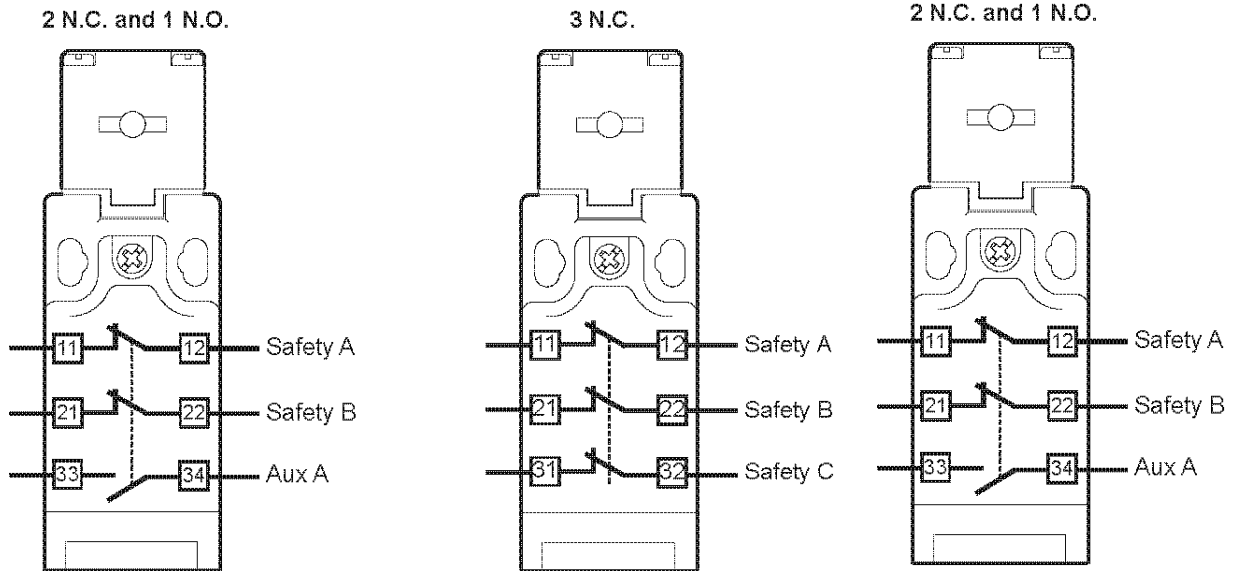
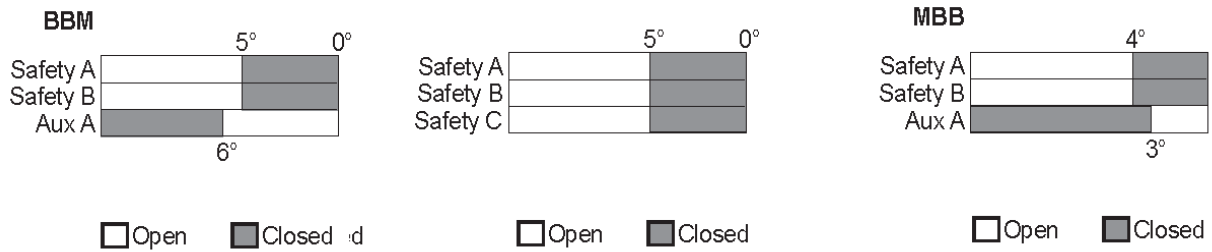


Figure 7 - Contact Action



6-Pin Micro (M12)



5-Pin Micro (M12) For ArmorBlock Guard I/O

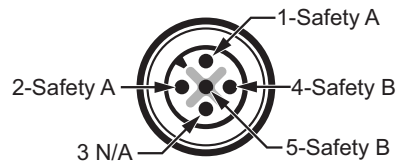


Table 15 - Cordset 889R-F5ECA-x⁽¹⁾ or Cordset 889R-F6ECA-x⁽¹⁾ Cordset 889D-F4AC-x

Pin	Color	6-Pin	5-Pin Micro (M12) For ArmorBlock Guard I/O
1	Red/White	Safety A	Safety A
2	Red	Safety B	Safety B
3	Green	Aux A	—
4	Red/Yellow	Aux A	Safety C
5	Red/Black	Safety A	Safety A
6	Red/Blue	Safety B	Safety B

Table 16 - Cordset 889D-F4AC-x⁽¹⁾

Pin	Color	5-Pin
1	Brown	Safety A
2	White	Safety A
3	N/A	—
4	Blue	Safety B
5	Black	Safety B

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

Rotacam Heavy-duty Hinge Interlock Switches

The Rotacam™ heavy-duty hinge interlock switches have the following features:

- Can be used as a hinge pin on light- and medium-weight guard doors
- Isolates power within 5° of door movement
- Degree of operation can be customized with adjustable cam
- Robust die-cast case, ideal for heavy-duty applications
- Contacts, 2 N.C. & 1 N.O.



Specifications

Attribute	Value			
Safety ratings				
Standards	ISO 13849-1, IEC/EN60204-1, NFPA79, EN1088, ISO14119, IEC/EN60947-5-1, ANSI B11.19, AS4024.1			
Safety classification	Dual channel interlocks suitable for use in Category 3 or Category 4 systems.			
Functional Safety Data (related to Safety Contacts) ⁽¹⁾	B10d: > 2 x 10 ⁶ operations at minimum load PFH _d : < 3 x 10 ⁻⁷ MTTFd: > 385 years May be suitable for use in performance levels PLe or PLd systems (according to ISO 13849-1) and for use in SIL2 or SIL3 systems (according to IEC 62061) depending on the architecture and application characteristics			
Certifications	CE Marked for all applicable directives, c-UL-us, SUVA, and TÜV www.rockwellautomation.com/certification/overview.page			
Operating characteristics				
Break contact force, min	8 cNm (torque on shaft)			
Actuation speed, max	160 mm (6.29 in.)/s			
Actuation frequency, max	1 cycle/s			
Mechanical life	1,000,000 operations			
Utilization category				
A600/AC-15 (Ue)	600V	500V	240V	120V
A600/AC-15 (Ie)	1.2 A	1.4 A	3 A	6 A
DC-13 (Ue)	24V	—	—	—
DC-13 (Ie)	2 A	—	—	—
Outputs				
Safety contacts ⁽²⁾	2 N.C. direct opening action			
Auxiliary contacts	1 N.O.			
Shaft rotation for contact operation	11° max, 5° min (adjustable)			
Thermal current/ <i>I_{th}</i>	10A			
Rated Insulation voltage U _i	500 V			
Switching current @ voltage, min	3 mA @ 18V DC			
Environmental				
Enclosure type rating	IP66			
Operating temperature	-20...+80 °C (-4...+176 °F)			
General				
Housing material	Heavy-duty die-cast alloy			

Attribute	Value
Actuator material	Stainless steel
Weight	420 g (0.926 lb)
Color	Red

- (1) Usable for ISO 13849-1 and IEC 62061. Data is based on the B10d value that is given and:
 —Usage rate of 1op/10mins., 24hrs/day, 360 days/year, representing 51,840 operations per year.
 —Mission time/Proof test interval of 38 years.
- (2) The safety contacts are described as normally closed (N.C.) for example: with the guard closed, actuator in place (where relevant) and the machine able to be started.

Product Selection

Table 16 - Selection

Contact		Action	Actuator Shaft Dimensions—mm (in)	Shaft Type	Cat. No.		
Safety	Auxiliary				M20 Conduit		Connector ⁽¹⁾
					M20	1/2 inch NPT Adapter	8-Pin Micro (M12)
2 N.C.	1 N.O.	BBM	85 x Ø12.7 (3.35 x 0.5)	Solid	440H-R03079	440H-R03088	440H-R03112
			30x Ø16 (1.18 x 0.63)	Pre-bored	440H-R03074	440H-R03078	440H-R03111

(1) For connector ratings, see [Table 12](#).

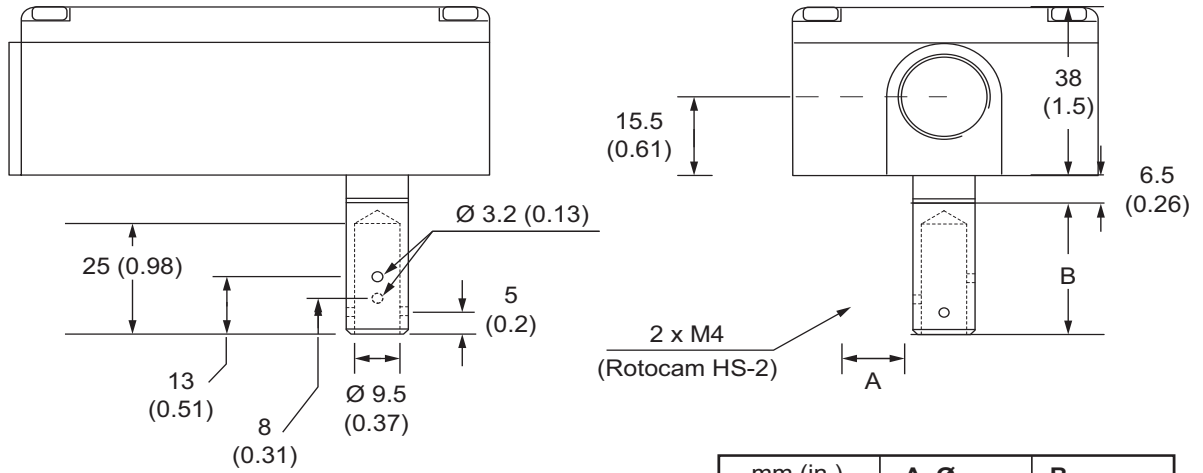
Table 17 - Connection Systems

Description	8-Pin Micro (M12) 2 N.C. and 1 N.O.
Cordset	889D-F8AB-x ⁽¹⁾
Patchcord	889D-F8ABDM-y ⁽²⁾

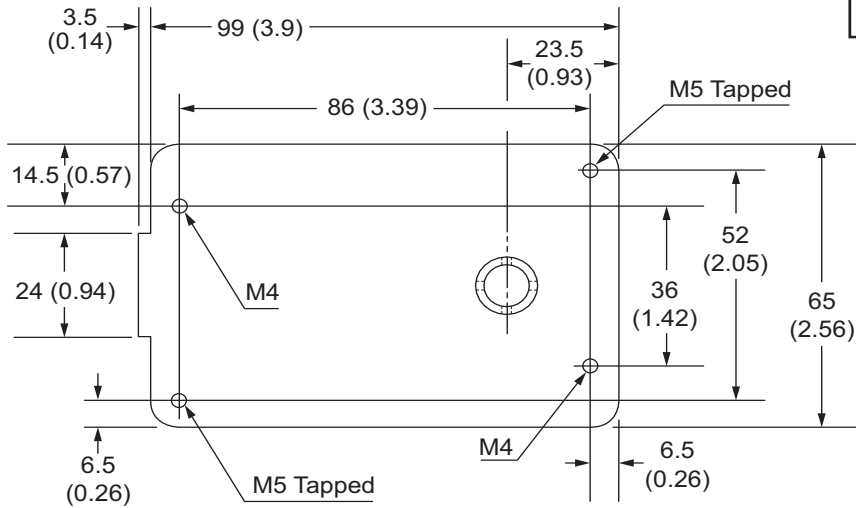
- (1) Replace x with 2 (2 m), 5 (5 m), or 10 (10 m) for standard cable lengths.
 (2) Replace y with 1 (1 m), 2 (2 m), 3 (3 m), 5 (5 m), or 10 (10 m) for standard cable lengths.

Approximate Dimensions

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



mm (in.)	A, Ø	B
	12.7 (0.5)	85 (3.35)
	16 (0.63)	30 (1.18)



Typical Wiring Diagrams

Figure 8 - Contact Configuration
2 N.C. and 1 N.O.

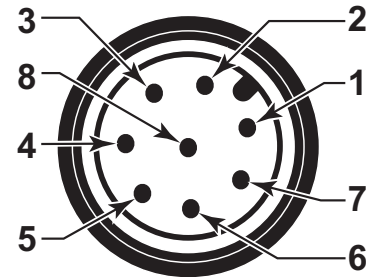
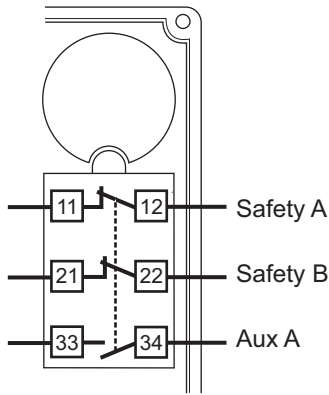


Figure 9 - Contact Action

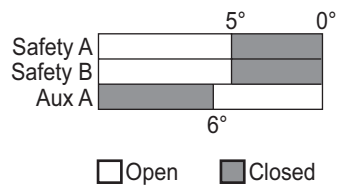


Table 18 - 8-Pin (M12) Cordset 889D-F8AB-x⁽¹⁾

Pin Number	Color	Description
1	White/Blue	Safety A
2	N/A	—
3	Green/Yellow	Aux A
4	Green/Yellow	Aux A
5	Grey/Pink	Safety B
6	Grey/Pink	Safety B
7	White/Blue	Safety A
8	Red	Ground

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

Non-contact Interlock Switches

Bulletin Number 440N

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SensaGuard Non-contact Interlock Switches

The SensaGuard™ non-contact interlock switches have the following features:

- Category 4, SIL 3 rated switch, TÜV functional safety approved to IEC 61508
- Switches can be connected to a standard safety relay, for example, the MSR126, MSR127, SmartGuard™ and Safety I/O Blocks
- Multiple actuator sizes for large sensing distance
- IP69K environmental rating
- Short-circuit and over-voltage protection
- LED located on the switch for door status and troubleshooting
- Unique coded version
 - Automatic learn process at unit power up
 - During commissioning you have the option to select if the sensor can learn a new actuator up to eight times or lock the unit so it can not learn another actuator
- Integrated latch version
 - Adjustable magnetic latch force 20...60 N
 - Designed for easy mounting on aluminum profile



The SensaGuard non-contact interlock switches offer the following benefits:

- No dedicated controller required
- Cat 4, SIL 3 rating maintained even with multiple units connected in series
- Switches can be connected in series with other devices (light curtain, E-stops, key interlock switches)
- Extended diagnostics for easy troubleshooting
- Large sensing distances
- Tolerance to misalignment
- Multiple sensing directions
- Stainless steel version suitable for use in harsh environments
- Use standard proximity brackets

Specifications

Attribute	Value
Safety Ratings	
Standards	ISO 14119, IEC 60947-5-3, IEC 61508, ISO 13849-1
Safety classification	Type 4 Interlocking Device per ISO 14119 (Unique/High and Standard/Low Coding), PLe cat. 4 per ISO 13849-1
Functional safety data	Visit http://literature.rockwellautomation.com/idc/groups/literature/documents/sr/safety-sr001_-en-e.pdf
Certifications	c-UL-us (UL 508), TÜV Certified, and CE Marked for all applicable directives www.rockwellautomation.com/certification/overview.page
Outputs (Guard Door Closed, Actuator in Place)	
Safety outputs	2 x PNP, 0.2 A, max; Status: ON (+24V DC)
Auxiliary outputs	1 x PNP, 0.2 A max; Status: OFF (0V DC)
Operating Characteristics	
Sensing distance (assure)	
18 mm plastic barrel/18 mm target	15 mm (0.59 in.)
18 mm plastic barrel/30 mm target	25 mm (0.98 in.)
18 mm stainless steel barrel/standard target	10 mm (0.39 in.)
Large rectangular flat pack with standard target	15 mm (0.59 in.)
Misalignment tolerance, min	See Magnetically Coded Non-contact Interlock Switches on page 55
Repeat accuracy	10% of Sensing Range
Output current	200 mA (all outputs), max
Operating voltage	24V DC, +10%/-15%; Class 2
Current consumption	50 mA
Frequency of operating cycle	1 Hz
Response time (off)	54 ms
Environmental	
Enclosure type rating	NEMA 3, 4X, 12, 13, IP69K
Operating temperature	-10...+55 °C (+14...+131 °F)
Relative humidity	5...95%
Shock	IEC 68-2-27, 30 g, 11 ms
Vibration	IEC 68-2-6 10...55 Hz
Radio frequency	IEC 61000-4-3, IEC 61000-4-6
Physical Characteristics	
Housing material	VALOX DR 48
Actuator material	VALOX DR 48
Color	Red

Product Selection

Type	Assured Sensing Distance [mm (in.)]	LED Door Indication/Diagnostic	Margin Indication	Magnetic Hold	Actuator Code Type	Cat. No.		
						Cable		Connector
						3 m	10 m	6 in. Pigtail, 8-pin Micro (M12)
18 mm plastic barrel/ 18 mm actuator	15 (0.59)	Yes	—	—	Standard	440N-Z21S16A	440N-Z21S16B	440N-Z21S16H
					18 mm plastic	440N-Z21U16A	440N-Z21U16B	440N-Z21U16H
18 mm plastic barrel/ 30 mm actuator	25 (0.98)	Yes	—	—	Standard	440N-Z21S26A	440N-Z21S26B	440N-Z21S26H
					30 mm plastic	440N-Z21U26A	440N-Z21U26B	440N-Z21U26H
18 mm stainless steel barrel/ 18 mm actuator	10 (0.39)	Yes	—	—	Standard	440N-Z21S17A	440N-Z21S17B	440N-Z21S17H
					18 mm stainless steel	440N-Z21U17A	440N-Z21U17B	440N-Z21U17H
Plastic rectangular/ rectangular actuator	15 (0.59)	Yes	—	—	Standard	440N-Z21SS2A	440N-Z21SS2B	440N-Z21SS2H
					Unique	440N-Z21US2A	440N-Z21US2B	440N-Z21US2H
			Yes	—	Standard	440N-Z21SS2AN	440N-Z21SS2BN	440N-Z21SS2HN
					Unique	440N-Z21US2AN	440N-Z21US2BN	440N-Z21US2HN
			Yes	Yes (9 N)	Standard	440N-Z21SS2AN9	440N-Z21SS2BN9	440N-Z21SS2HN9
					Unique	440N-Z21US2AN9	440N-Z21US2BN9	440N-Z21US2HN9
Plastic housing with integrated latch	Contact/latched	Yes	—	Adjustable 20...60 N	Standard	440N-Z21SS3PA	440N-Z21SS3PB	440N-Z21SS3PH
					Unique	440N-Z21SU3PA	440N-Z21SU3PB	440N-Z21SU3PH

Table 19 - Connection Systems






Description	Cat. No.
Cordset	889D-F8AB-x ⁽¹⁾
Patchcord	889D-F8ABDM-y ⁽²⁾
Safety Wired T-Port	898D-438Y-D8
Safety Wired Shorting Plug	898D-418U-DM

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

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

Accessories

Description		To Be Used With	Cat. No.
	18 mm plastic actuator (Series A)	Standard coded models only	440N-Z18PT
		Unique coded models only	440N-Z18UPT
	18 mm plastic actuator (Series B)	Standard coded models only	440N-Z18PTB
		Unique coded models only	440N-Z18UPTB
	30 mm plastic actuator (Series A)	Standard coded models only	440N-Z30PT
		Unique coded models only	440N-Z30UPT
	30 mm plastic actuator (Series B)	Standard coded models only	440N-Z30PTB
		Unique coded models only	440N-Z30UPTB
	18 mm stainless steel actuator (Series A)	Standard coded models only	440N-Z18SST
		Unique coded models only	440N-Z18USST
	18 mm stainless steel actuator (Series B)	Standard coded models only	440N-Z18SSTB
		Unique coded models only	440N-Z18USSTB
	Rectangular plastic actuator (Series A)	Standard coded models only	440N-ZPREC
		Unique coded models only	440N-ZUPREC
		Standard coded margin/magnetic hold models only	440N-ZPRECM
		Unique coded margin/magnetic hold models only	440N-ZUPRECM
		Standard coded margin indication models	440N-ZPREC
		Unique coded margin indication models	440N-ZUPRECM
	Rectangular plastic actuator (Series B)	Standard coded models only	440N-ZPRECB
		Unique coded models only	440N-ZUPRECB
		Standard coded margin/magnetic hold models only	440N-ZPRECMB
		Unique coded margin/magnetic hold models only	440N-ZUPRECMCB
		Standard coded margin indication models	440N-ZPRECM1B
		Unique coded margin indication models	440N-ZUPRECM1B

Description		To Be Used With	Cat. No.
	Mounting bracket for tubular proximity sensors—right angle style	18 mm barrel models	871A-BRS18
	Mounting bracket for tubular sensors—clamp style		871A-BP18
	Snap clamp mounting bracket		871A-SCBP18
	18 mm mounting bracket		60-2649
	Mounting plate for vertically hinged doors	Integrated latch version only	440N-AHDB
	Mounting plate for slide and gull wing doors		440N-ASDB
	Mounting bracket for tubular proximity sensors—right angle style	18 mm barrel models	871A-BRS18

Approximate Dimensions

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

Figure 9 - 18 mm Barrel

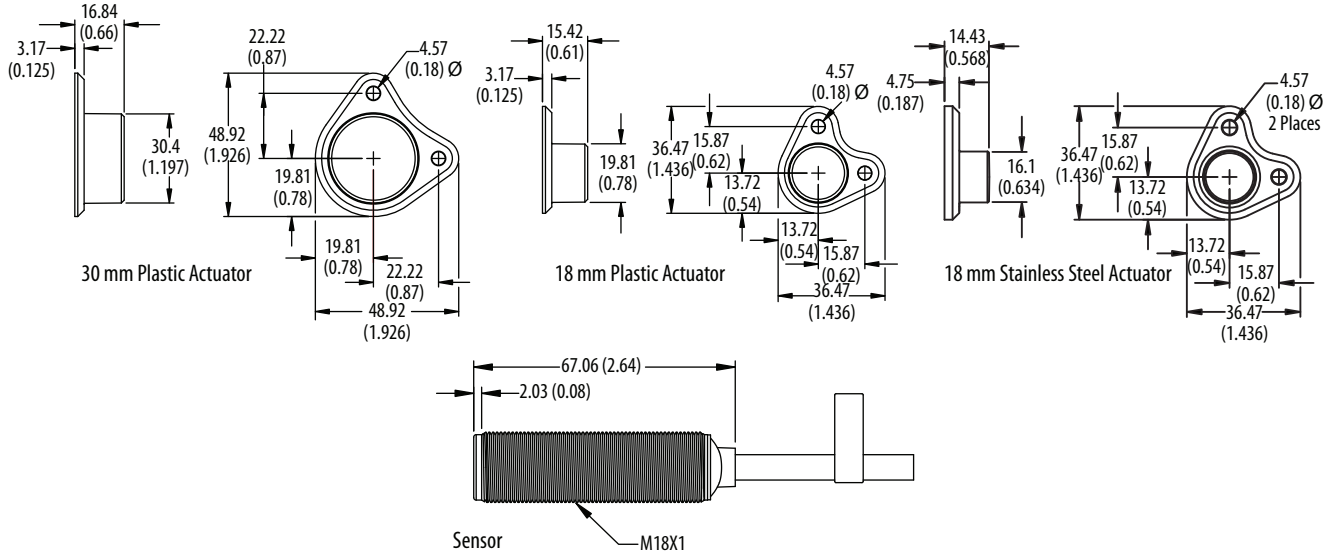


Figure 10 - Large Rectangular Flat Pack

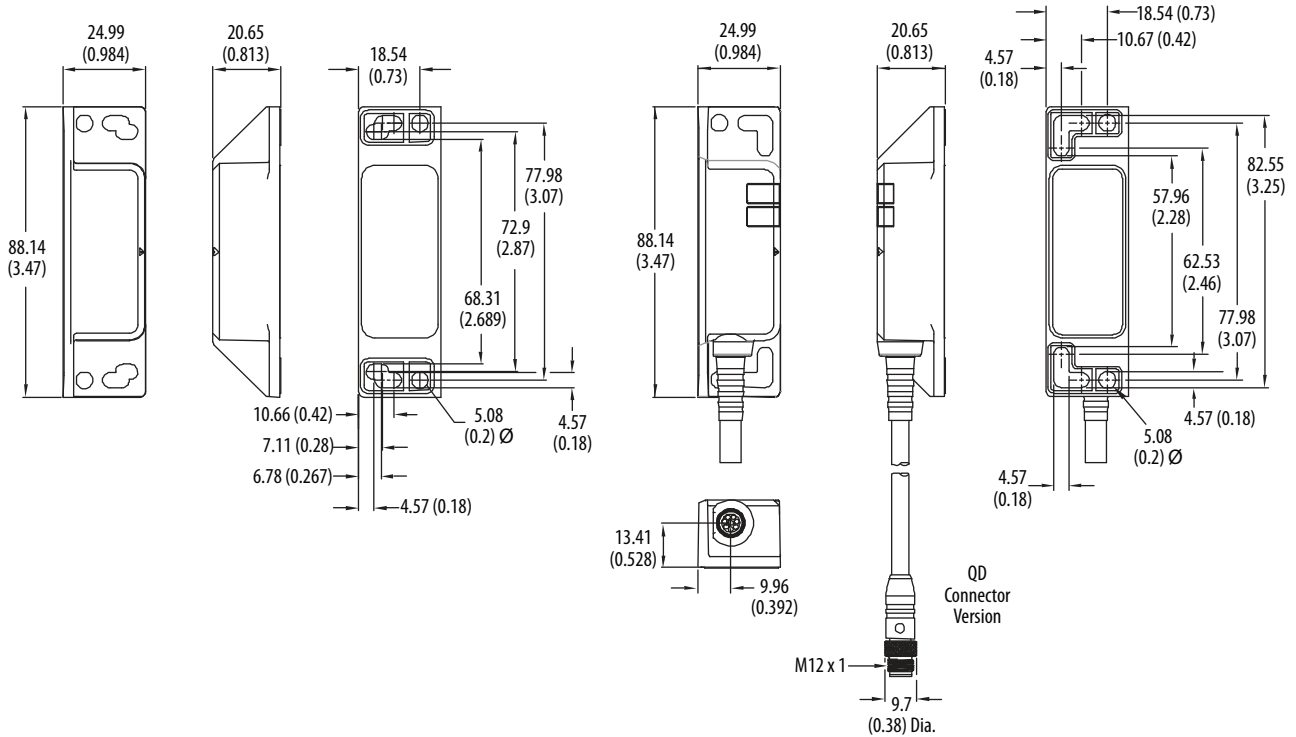


Figure 11 - Integrated Latch

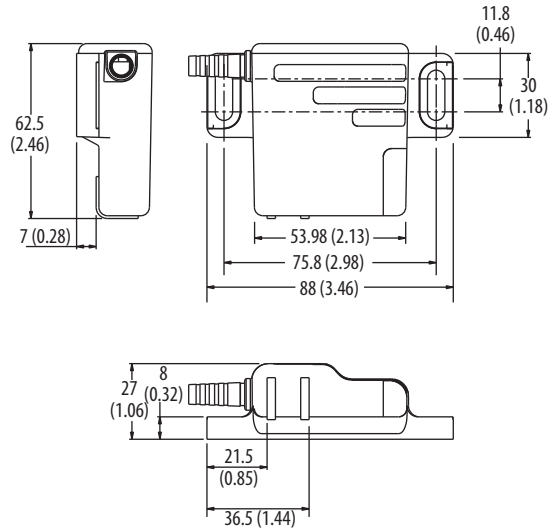


Table 20 - Typical Wiring Diagrams

Description		Plastic	Stainless Steel
8-pin Micro (M12)			
8-pin cordset 889D-F8AB-x or cable version ⁽¹⁾	Gray	Safety A	Safety A
	Red	Safety A+	Safety A+
	Pink	Safety B	Safety B
	Yellow	Safety B+	Safety B+
	White	Aux A	Aux A
	Brown	24V DC +	24V DC +
	Blue	Gnd	Gnd
	Green	—	—

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

Magnetically Coded Non-contact Interlock Switches

The magnetically coded non-contact interlock switches have the following features:

- Non-contact actuation
- Magnetic coded sensing
- High tolerance to misalignment
- Designed for use with specified controllers



Specifications

Attribute	Value	
	MC1	MC2
Safety Ratings		
Standards	ISO14119, IEC 60947-5-3, ISO13849-1 when used with approved safety control	
Safety classification	Type 4 Interlocking Device with low coding per ISO 14119	
Functional safety data	Visit http://literature.rockwellautomation.com/idc/groups/literature/documents/sr/safety-sr001_-en-e.pdf	
Certifications	c-UL-us Listed, TÜV Certified, and CE Marked for all applicable directives www.rockwellautomation.com/certification/overview.page	
Outputs (Guard Door Closed, Actuator in Place)		
Safety outputs	2 N.C. REEDS	2 N.C. Solid-state Relays
Auxiliary outputs	—	1 x PNP, 0.2 A max.; Status: OFF (0V DC)
Operating Characteristics		
Operating distance, make	8 mm (0.3 in.)	10 mm (0.39 in.)
Operating distance, break	15 mm (0.59 in.)	25 mm (0.98 in.)
Repeat accuracy	10% of Sensing Range	
Output current	200 mA, max	
Switching current @ voltage	24V DC @ 200 mA, max	24V DC @ 200 mA +10%/-15%, max
Operating voltage/power supply	—	24V DC, +10%/-15%/50 mA max/Class 2 SELV
Frequency of operating cycle	1 Hz	
Environmental		
Enclosure type rating	IP67 (NEMA 6P)	IP 69K
Operating temperature	-10...+55 °C (+14...+131 °F)	
Relative humidity	5...95%	
Shock	IEC 68-2, 27, 30 g, 11 ms	
Vibration	IEC 68-2-6, 10...55 Hz	
Radio frequency	IEC 61000-4-3, IEC 61000-4-6	
Physical Characteristics		
Housing material	Molded ABS	Ultrador
Actuator material	Molded ABS	Ultrador
Color	Red	

Product Selection

Type	Operating Voltage/ Input Current	Safety Outputs	Auxiliary Outputs	Status Indicator	Connection	Cat. No.
MC1	—	2 N.C. REEDS	—	No	4-pin Micro (M12)	440N-Z2NRS1C
					3 m Cable	440N-Z2NRS1A
					10 m Cable	440N-Z2NRS1B
MC2	24V DC, +10%/ 15%/ 50 mA, max	2 N.C. Solid-State Relays	1 x PNP, 0.2 A max.; Status: OFF (0V DC)	Yes	8-pin Micro (M12)	440N-Z21W1PH
					3 m Cable	440N-Z21W1PA
					10 m Cable	440N-Z21W1PB

Table 21 - Connection Systems

Description	Connection to Distribution Box	
	4-pin Micro (M12) 2 N.C.	8-pin Micro (M12) 2 N.C. & 1 N.O.
Cordset	889D-F4AC-x ⁽¹⁾	889D-F8AB-x ⁽¹⁾
Patchcord	889D-F4ACDM-y ⁽²⁾	889D-F8ABDM-y ⁽²⁾
Distribution Box	898D-4zLT-DM4 ⁽³⁾	—
Shorting Plug	898D-41LU-DM	—
T-Port	898D-43LY-D4	—

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

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

(3) Replace z with 4 or 8 for number of ports.

Accessories

Description	Cat. No.
MC1 spare actuator	440N-A17233
MC2 spare actuator	440N-A32114

Approximate Dimensions

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

Figure 12 - MC1

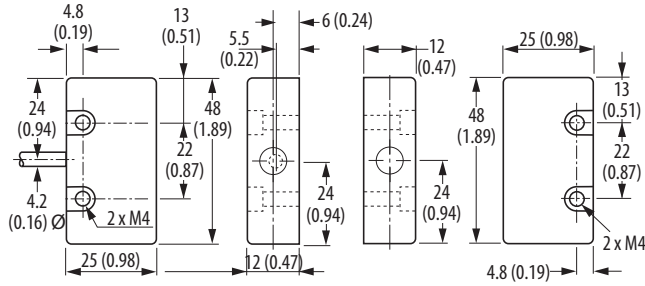
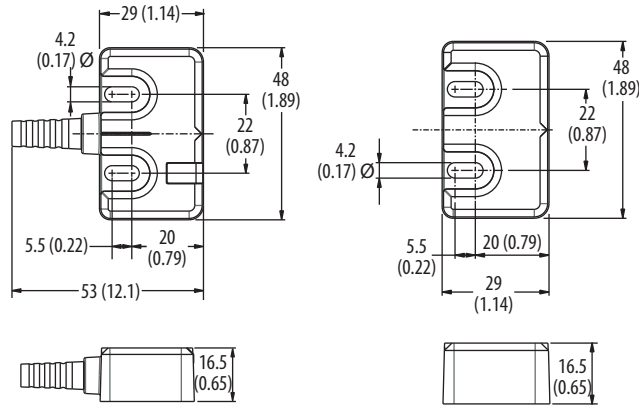


Figure 13 - MC2



Typical Wiring Diagrams

Description		MC1 — 2 N.C.	MC2 — 2 N.C. and 1 N.O.
4-pin Micro (M12)			—
Cordset 889D-F4AC-x or Cable Version ⁽¹⁾	Brown	Safety A	—
	Blue	Safety A	—
	White	Safety B	—
	Black	Safety B	—

Description		MC1 — 2 N.C.	MC2 — 2 N.C. and 1 N.O.
8-pin Cordset 889D-F8AB-x or Cable Version ⁽¹⁾	Gray	—	Safety A
	Red		Safety A
	Pink		Safety B
	Yellow		Safety B
	White		Aux
	Brown		24V DC +
	Blue		Gnd
	Green		—

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

Ferrogard Safety Switches

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

Ferrogard 1, 2, 20, and 21 Non-contact Interlock Switches

The Ferrogard 1, 2, 20, and 21 non-contact interlock switches have the following features:

- Non-contact actuation
- High tolerance to misalignment
- High switching current (up to 2 A AC, 1 A DC)
- Plastic rectangular housing (IP67)
- Cable or quick-disconnect (QD) connections



Specifications

Attribute	Value
Safety Ratings	
Standards	ISO13849-1, IEC/EN60204-1, NFPA79, EN1088, AS4024.1
Safety classification	Cat. 1 Device per ISO13849-1. Dual channel interlocks suitable for Cat. 3 or 4 systems
Functional safety data ⁽¹⁾	B10d: > 2 x 10 ⁶ operations at min. PFH _d : > 3 x 10 ⁻⁷ MTTFd: > 385 years Dual channel interlock may be suitable for performance levels PLe or PLd (according to ISO 13849-1:2006) and for use in SIL2 or SIL3 systems (according to IEC 62061) depending on application characteristics
For up-to-date information, visit https://ab.rockwellautomation.com/safety	
Certifications	CE Marked for all applicable directives www.rockwellautomation.com/certification/overview.page
Outputs (Guard Door Closed, Actuator in Place)	
Safety outputs	FRS1: 1 N.C., FRS2: 1 N.C., FRS20: 2 N.C., FRS21: 2 N.C.
Auxiliary outputs	FRS1: None, FRS2: 1 N.O., FRS20: None, FRS21: 1 N.O.
Operating Characteristics	
Operating distance, make	Safety: 12 mm (0.47 in.); Auxiliary: 15 mm (0.59 in.)
Operating distance, break	Safety: 23 mm (0.91 in.); Auxiliary: 26 mm (1.02 in.)
Fuses, external	FRS1, 2 & 21: 1.6 A (Bussmann BK/60 A-1.6 A) max FRS20: 0.4 A (Bussmann BK/60 A-400 mA) max
Environmental	
Enclosure type rating	IP67 (NEMA 6P)
Operating temperature	-10...+55 °C (+14...+131 °F)
Relative humidity	5...95%
Shock	50 g
Vibration	7 g; 50...200 Hz
Radio frequency	IEC 61000-4-3, IEC 61000-4-6
Physical Characteristics	
Housing material	Molded ABS plastic

Attribute	Value
Actuator material	Molded ABS plastic
Weight	FRS 1-Sensor: 35 g (0.08 lb)/Actuator: 85 g (0.19 lb) FRS 2-Sensor: 40 g (0.09)/Actuator: 85 g (0.19 lb) FRS 20-Sensor: 43 g (0.09)/Actuator: 85 g (0.19 lb) FRS 21-Sensor: 43 g (0.09)/Actuator: 85 g (0.19 lb)
Color	Red

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

Product Selection

Switching Capability	Safety Contacts ⁽¹⁾	Auxiliary Contacts ⁽¹⁾	Connection	Type	Cat. No.
250V AC, 2 A max	1 N.C.	—	2 m Cable	FRS 1	440N-G02001
			4 m Cable		440N-G02004
			6 m Cable		440N-G02022
			8 m Cable		440N-G02041
			10 m Cable		440N-G02015
		1 N.O.	2 m Cable	FRS 2	440N-G02002
			4 m Cable		440N-G02014
			6 m Cable		440N-G02038
			8 m Cable		440N-G02033
			10 m Cable		440N-G02019
	2 N.C.	—	15 m Cable	440N-G02043	
			20 m Cable	440N-G02040	
			4-pin Micro QD	440N-G02093	
	2 N.C.	—	4-pin Micro QD	FRS 20	440N-G02097
	2 N.C.	1 N.O.	2 m Cable	FRS 21	440N-G02055
			4 m Cable		440N-G02061
			6 m Cable		440N-G02060
			10 m Cable		440N-G02059
6-pin AC Micro QD ⁽²⁾			440N-G02098		
24V DC, 1 A	1 N.C.	1 N.O.	2 m Cable	FRS 2	440N-G02092
			4-pin Micro QD		440N-G02094
	2 N.C.	—	4 m Cable	FRS 20	440N-G02085
			4-pin Micro QD		440N-G02090
		1 N.O.	2 m Cable	FRS 21	440N-G02058
			4 m Cable		440N-G02077
			6 m Cable		440N-G02083
			6-pin Micro QD		440N-G02099

(1) Contacts are described with the guard door closed, that is, actuator in place. Switch is shipped complete with actuator.

(2) For connector ratings refer to [Table 23](#).

Table 22 - Connection Systems

Description	Connection to Distribution Box	
	4-pin Micro (M12) 1 N.C. & 1 N.O.	6-pin Micro (M12) 2 N.C. & 1 N.O.
Cordset	889D-F4AC-x ⁽¹⁾	889R-F6ECA-x ⁽¹⁾
Patchcord	889D-F4ACDM-y ⁽²⁾	889R-F6ECRM-y ⁽²⁾
Distribution box	898D-P4zKT-DM4 ⁽³⁾	898R-F68MT-A5
Shorting plug	898D-41KU-DM	898R-P61MU-RM
T-port	898D-43KY-D4	—

- (1) Replace x with 2 (2 m), 5 (5 m), or 10 (10 m) for standard cable lengths.
- (2) Replace y with 1 (1 m), 2 (2 m), 3 (3 m), 5 (5 m), or 10 (10 m) for standard cable lengths.
- (3) Replace z with 4 or 8 for number of ports.

Table 23 - Connector Ratings

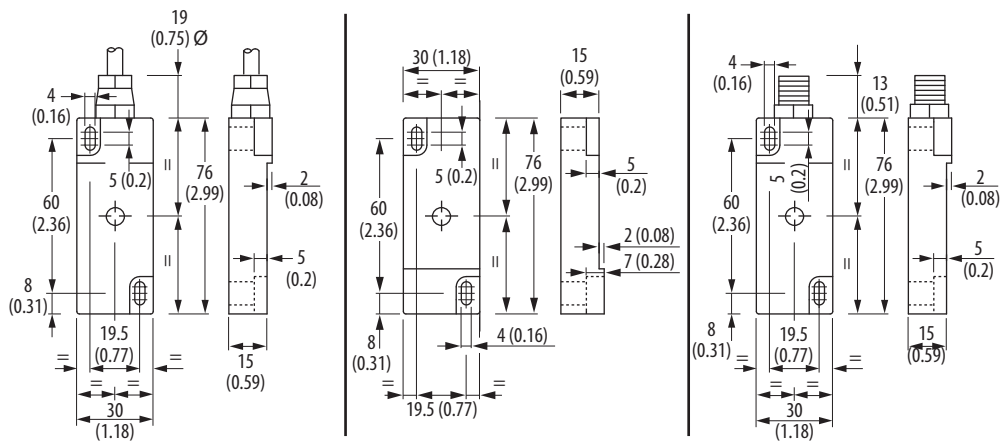
Description	Max Ratings		Applicable Standards
	AC	DC	
4-pin Micro (M12)	250V, 4 A	250V, 4 A	IEC 61076-2-101:2003
5-pin Micro (M12)	60V, 4 A	60V, 4 A	IEC 61076-2-101:2003
6-pin Micro (M12)	30V, 2 A	30V, 2 A	IEC 61076-2-101:2003
8-pin Micro (M12)	30V, 2 A	30V, 2 A	IEC 61076-2-101:2003
12-pin M23	63V, 6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

Accessories

Description	Cat. No.
Replacement actuator	440N-A02005

Approximate Dimensions

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



Typical Wiring Diagrams

		FRS1 1 N.C.	FRS2 1 N.C. + 1 N.O.	FRS20 2 N.C.	FRS21 2 N.C. + 1 N.O.
4-pin Micro (M12)		—			
6-pin Micro (M12)		—	—	—	
Cordset 889D-F4AC-x or Cable Versions ⁽¹⁾	Brown	—	Safety A	Safety A	—
	Blue	—	—	—	—
	Black	—	—	—	—
	White	—	—	—	—
Cordset 889R-F6ECA-x ⁽¹⁾	Red/White	—	—	—	Safety A
	Red/Black	—	—	—	Safety B
	Red	—	—	—	Aux A
	Red/Blue	—	—	—	—
	Green	—	—	—	—
Cable Versions	Safety A	Brown	Blue	Brown	Black
		Blue	White	Blue	White
	Safety B	—	Yellow	Black	Red
		—	Green	White	Blue
	Aux A	—	—	—	Yellow
		—	—	—	Green

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

Ferrogard 3, 4, and 5 Non-contact Interlock Switches

The Ferrogard 3, 4, and 5 non-contact interlock switches have the following features:

- Non-contact actuation
- High tolerance to misalignment
- High switching current (up to 2 A)
- Various contact arrangements
- Terminal connections



Specifications

Attribute	Value
Safety Ratings	
Standards	ISO13849-1, IEC/EN 60204-1, NFPA79, EN 1088, AS4024.1
Safety classification	Cat. 1 Device per ISO13849-1. Dual channel interlocks suitable for Cat. 3 or 4 systems
Functional safety data ⁽¹⁾	B10d: > 2 x 10 ⁶ operations at min. PFH _d : > 3 x 10 ⁻⁷ MTTFd: > 385 years
For up-to-date information, visit https://ab.rockwellautomation.com/safety	Dual channel interlock may be suitable for performance levels PL _e or PL _d (according to ISO 13849-1:2006) and for use in SIL2 or SIL3 systems (according to IEC 62061) depending on application characteristics
Certifications	CE Marked for all applicable directives www.rockwellautomation.com/certification/overview.page
Outputs (Guard Door Closed, Actuator in Place)	
Safety outputs	FRS3: 1 N.C., FRS4: 1 N.C., FRS5: 1 N.C
Auxiliary outputs	FRS3: 1 N.C., FRS4: 1 N.O., FRS5: None
Operating Characteristics	
Operating distance, make [mm (in.)]	Safety/Auxiliary: FRS 3: 12 (0.47) FRS 4: 12 (0.47) FRS 5: 12 (0.47)
Operating distance, break [mm (in.)]	Safety/Auxiliary: FRS 3: 24 (0.94) FRS 4: 10 (0.39) FRS 5: 12 (0.47)
Auxiliary contact switching capability	300V DC, 250V AC 0.5 A including inrush, min
Safety contact external fusing	≤1.6 A quick blow
Environmental	
Enclosure type rating	IP65 (NEMA 13)
Operating temperature	-10...+65 °C (+14...+149 °F)
Relative humidity	5...95%
Shock	IEC 68-2-27, 30 g, 11 ms
Vibration	IEC 68-2-6, 10...200 Hz
Radio frequency	IEC 61000-4-3, IEC 61000-4-6
Physical Characteristics	
Housing material	Molded ABS plastic
Actuator material	Molded ABS plastic
Color	Red

(1) Usable for ISO 13849-1:2006 and IEC 62061. Data other than B10d is based on:

- Usage rate of 1op/10 mins., 24 hrs/day, 360 days/year, representing 51840 operations per year
- Mission time/proof test interval of 38 years

Product Selection

Safety Contact Switching Capability	Connection Type	Housing Material	Safety Contacts ⁽¹⁾	Auxiliary Contacts ⁽¹⁾	Type	Cat. No.
250V AC 2 A max	Terminals	Red Molded ABS Plastic	1 N.C.	1 N.C.	FRS 3	440N-G02003
				1 N.O.	FRS 4	440N-G02008
				—	FRS 5	440N-G02009

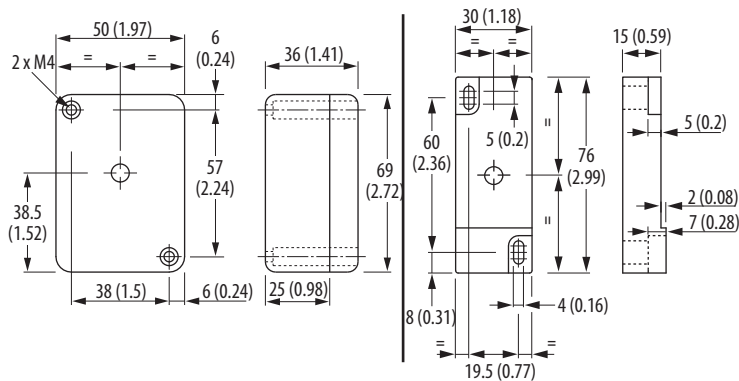
(1) Contacts are described with the guard door closed, that is, actuator in place.

Accessory

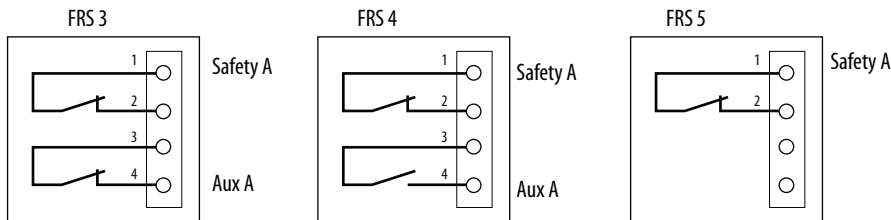
Description	Cat. No.
Replacement Actuator	440N-A02005

Approximate Dimensions

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



Typical Wiring Diagrams



Ferrogard 6, 9, 10, 13, and 14 Non-contact Interlock Switches

The Ferrogard 6, 9, 10, 13, and 14 non-contact interlock switches have the following features:

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



Specifications

Attribute	Value	
Safety Ratings		
Standards	ISO13849-1, IEC/EN60204-1, NFPA79, EN1088, AS4024.1	
Safety classification	Cat. 1 Device per ISO13849-1. Dual channel interlocks suitable for Cat. 3 or 4 systems	
Functional safety data ⁽¹⁾	B10d: > 2 x 10 ⁶ operations at min. PFH _p : > 3 x 10 ⁻⁷ MTTFd: > 385 years Dual channel interlock may be suitable for performance levels PLe or PLd (according to ISO 13849-1:2006) and for use in SIL2 or SIL3 systems (according to IEC 62061) depending on application characteristics	
For up-to-date information, visit https://ab.rockwellautomation.com/safety		
Certifications		
FRS6, FRS9, FRS10	CE Marked for all applicable directives www.rockwellautomation.com/certification/overview.page	
FRS13, FRS14	CE Marked for all applicable directives and c-UL-us www.rockwellautomation.com/certification/overview.page	
Outputs (Guard Door Closed, Actuator in Place)		
Safety outputs	1 N.C.	1 N.C.
Auxiliary outputs	—	1 N.C.
Operating Characteristics		
Operating distance, make	12 mm (0.47 in.)	
Operating distance, break	23 mm (0.91 in.)	
Environmental		
Enclosure type rating	IP67 (NEMA 6P)	
Operating temperature	-10...+65 °C (+14...+149 °F)	
Relative humidity	5...95%	
Shock	IEC 68-2-27, 30 g, 11 ms	
Vibration	IEC 68-2-6, 10...55 Hz	
Radio frequency	IEC 61000-4-3, IEC 61000-4-6	
Physical Characteristics		
Housing material	Molded ABS plastic	
Actuator material	Molded ABS plastic	
Weight of Sensor	28 g (0.06 lb)	
Weight of Actuator	70 g (0.15 lb)	
Color	Red	

(1) Usable for ISO 13849-1:2006 and IEC 62061. Data other than B10d is based on:

- Usage rate of 1op/10 mins., 24 hrs/day, 360 days/year, representing 51840 operations per year
- Mission time/proof test interval of 38 years

Product Selection

Safety Contact Switching Capability	Safety Contacts ⁽¹⁾	Auxiliary Contacts ⁽¹⁾	Housing Material	Type	Connection	Cat. No.
250V AC, 2 A	1 N.C.	—	Red Molded ABS Plastic	FRS 6	2 m Cable	440N-G02023
					4 m Cable	440N-G02028
					6 m Cable	440N-G02032
					10 m Cable	440N-G02013
					4-pin Micro QD	440N-G02095
24V DC, 1 A				FRS 9	2 m Cable	440N-G02044
					4 m Cable	440N-G02075
					6 m Cable	440N-G02082
					10 m Cable	440N-G02089
					4-pin Micro QD	440N-G02096
110V AC, 3 A	FRS 10	2 m Cable	440N-G02045			
		4 m Cable	440N-G02088			
250V AC, 2 A	1 N.C.	Stainless Steel	FRS 13	2 m Cable	440N-G02154	
				4 m Cable	440N-G02155	
				8-pin Micro QD	440N-G02160	
24V DC, 1 A			FRS 14	2 m Cable	440N-G02156	
				4 m Cable	440N-G02157	
				8-pin Micro QD	440N-G02161	

(1) Contacts are described with the guard door closed, that is, actuator in place.

Table 24 - Connection Systems

Description	4-pin Micro (M12)	8-pin Micro (M12)
Cordset	889D-F4AC-x ⁽¹⁾	889D-F8AB-x ⁽¹⁾
Patchcord	889D-F4ACDM-y ⁽²⁾	889D-F8ABDM-y ⁽²⁾

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

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

Approximate Dimensions

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

Figure 14 - FRS 6, 9, and 10

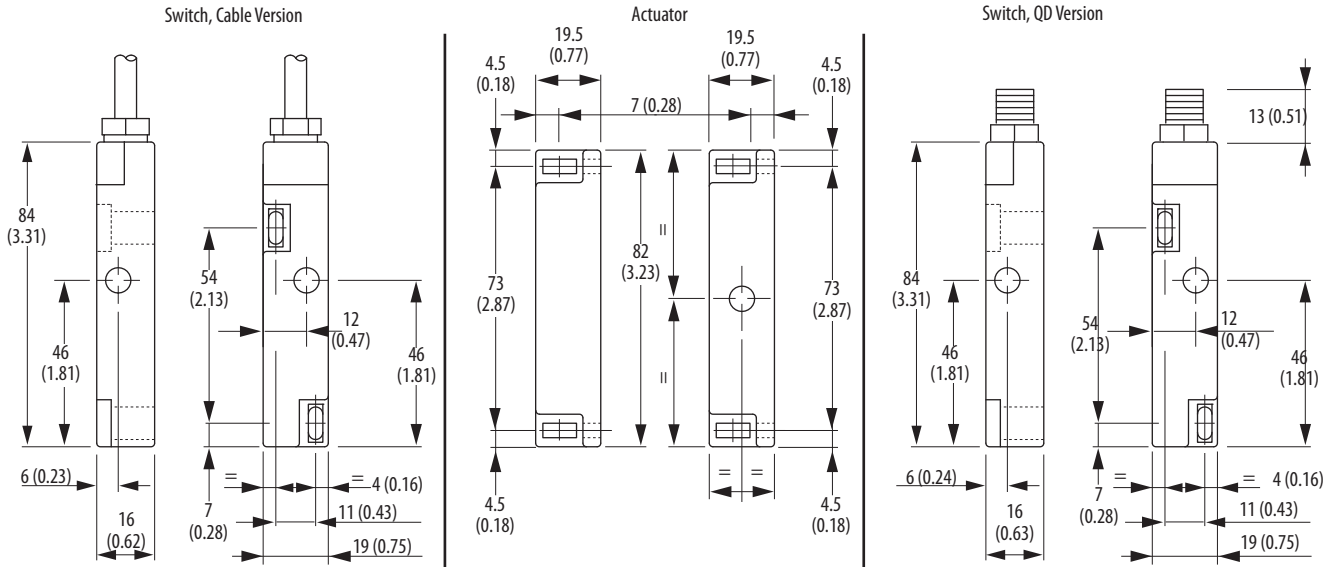
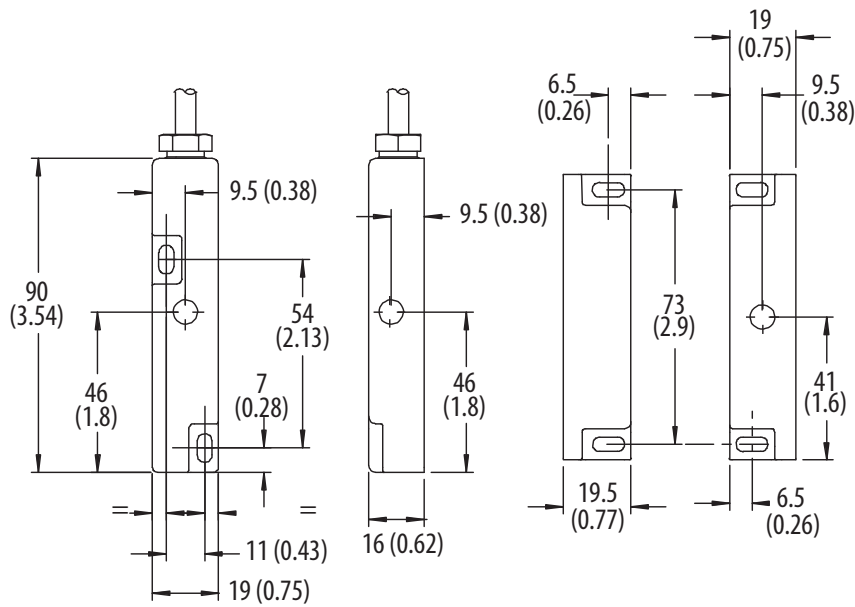


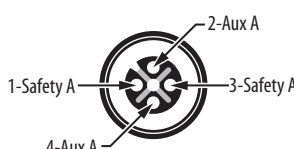
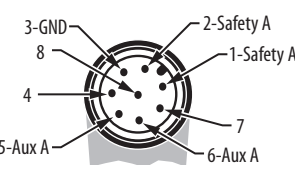
Figure 15 - FRS 13 and 14



Accessories

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

Typical Wiring Diagrams

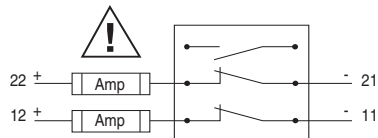
Description		FRS 6, 9 and 10 1 N.C.	FRS 13 and 14 1 N.C. and 1 N.C.
4-pin Micro (M12)			—
8-pin Micro (M12)		—	
Cordset 889D-F4AC-x ⁽¹⁾	Brown	Safety A	Safety A
	Blue	—	—
	White	—	Aux A
	Black	—	—
Cordset 889D-F8AB-x ⁽¹⁾	White	—	Safety A
	Brown	—	—
	Gray	—	Aux A
	Pink	—	—
Cable Version	Safety A	Brown	Brown
		Blue	Blue
Cable Version	Aux A	—	Black
		—	Gray

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



WARNING: All safety contacts fitted with internal non-resettable fuse and must be fused externally as detailed.

Table 25 - External Fuse Safety Contacts

	
FRS 1, 2, 3, 4, 5, 6, 13, 21 AC	AC 1.6 A ⁽¹⁾ ≤ (F) IEC 60127-2
FRS 9, 14, 2 DC, 20 DC, 21 DC	DC 0.4 A ⁽²⁾ ≤ (F) IEC 60127-2
FRS 10	AC 2.5 A ⁽³⁾ ≤ (F) IEC 60127-2

(1) Recommended: Bussman BK/GDA-1.6 A

(2) Recommended: Bussman BK/GDA-400 mA

(3) Recommended: Bussman BK/GDA-2.5 A

Ferrogard GD2 Non-contact Interlock Switches

The Ferrogard GD2 non-contact interlock switches have the following features:

Features

- Non-contact actuation
- High tolerance to misalignment
- High switching current (up to 2 A AC, 1 A DC)
- Wide temperature range (-25...+125 °C [-13...+257 °F])
- Stainless steel housing
- Various contact arrangements



Specifications

Attribute	Value		
Safety Ratings			
Standards	ISO13849-1, IEC/EN 60204-1, NFPA79, EN1088, ISO14119, ANSI B11.19, AS4024.1		
Safety classification	Dual channel interlocks suitable for Cat. 3 or 4 systems		
Functional safety data ⁽¹⁾	B10d: > 2 x 10 ⁶ operations at min. PFH _p : > 3 x 10 ⁻⁷ MTTFd: > 385 years		
For up-to-date information, visit https://ab.rockwellautomation.com/safety	Dual channel interlock may be suitable for performance levels PLe or PLd (according to ISO 13849-1:2006) and for use in SIL2 or SIL3 systems (according to IEC 62061) depending on application characteristics		
Certifications	CE Marked for all applicable directives and c-UL-us www.rockwellautomation.com/certification/overview.page		
Outputs (Guard Door Closed, Actuator in Place)			
Safety outputs	1 N.C.	2 N.C.	2 N.C.
Auxiliary outputs	1 N.O.	—	1 N.O.
Operating Characteristics			
Operating distance, make [mm (in.)]	Safety: 12 (0.47); Auxiliary: 15 (0.59)		
Operating distance, break [mm (in.)]	Safety: 23 (0.91); Auxiliary: 26 (1.02)		
Environmental			
Enclosure type rating	IP68 (NEMA 6P)		
Operating temperature	-25...+125 °C (-13...+257 °F)		
Relative humidity	5...95%		
Shock	IEC 68-2-27, 30 g, 11 ms		
Vibration	IEC 68-2-6, 10...200 Hz		
Radio frequency	IEC 61000-4-3, IEC 61000-4-6		
Physical Characteristics			
Housing material	Stainless Steel; BS3146 ANC4B (316L)		
Actuator material	Stainless Steel; BS3146 ANC4B (316L)		
Weight, sensor [g (lb)]	156 (0.34)		
Weight, actuator [g (lb)]	168 (0.37)		

(1) Usable for ISO 13849-1:2006 and IEC 62061. Data other than B10d is based on:

- Usage rate of 1op/10 mins., 24 hrs/day, 360 days/year, representing 51840 operations per year
- Mission time/proof test interval of 38 years

Product Selection

Safety Contact Switching Capability	Safety Contacts ⁽¹⁾	Auxiliary Contacts ⁽¹⁾	Connection	Type	Cat. No.
250V AC, 2 A max	2 N.C.	—	3 m Cable	FRS 20 GD2	440N-G02113
	1 N.C.	1 N.O.	3 m Cable	FRS 2 GD2	440N-G02112
	2 N.C.		3 m Cable	FRS 21 GD2	440N-G02117
24V DC, 1 A max	1 N.C.	1 N.O.	3 m Cable	FRS 2 GD2	440N-G02118
			10 m Cable	FRS 2 GD2	440N-G02147
	2 N.C.	—	3 m Cable	FRS 20 GD2	440N-G02119
	2 N.C.	1 N.O.	3 m Cable	FRS 21 GD2	440N-G02123
			6 m Cable	FRS 21 GD2	440N-G02143
			10 m Cable	FRS 21 GD2	440N-G02137
			8-pin Micro (M12)	FRS 21 GD2	440N-G02149

(1) Contacts are described with the guard door closed, that is, actuator in place. Switch is shipped with complete actuator.

Table 26 - Connection Systems

Description	8-pin Micro (M12)
Cordset	889D-F8AB-x ⁽¹⁾
Patchcord	889D-F8ABDM-y ⁽²⁾

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

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

Accessory

Description	Cat. No.
Actuator	440N-A02128

Approximate Dimensions

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

Figure 16 - Switch

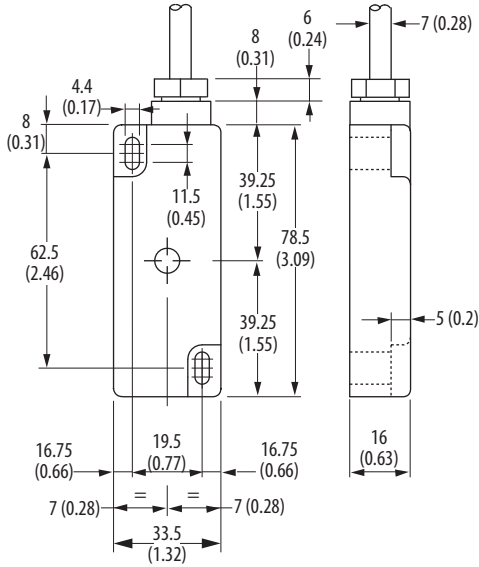
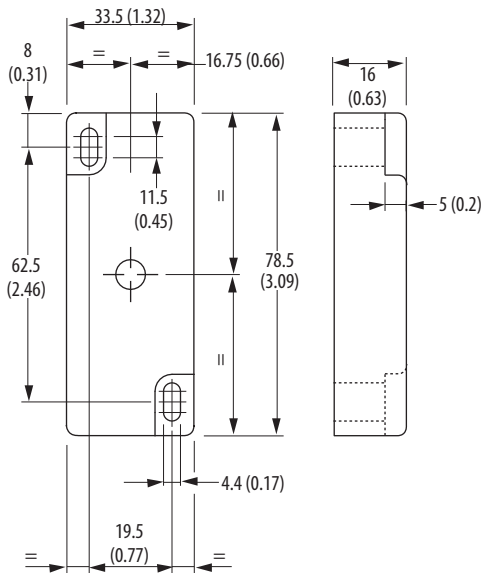
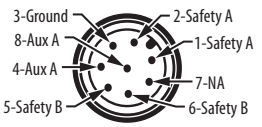


Figure 17 - Actuator



Typical Wiring Diagrams

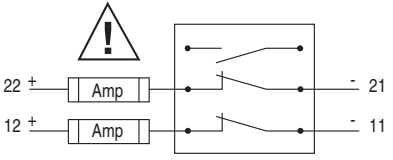
Description		FRS21 2 N.C. and 1 N.O.	FRS2 1 N.C. and 1 N.O.	FRS20 2 N.C.
Cable Versions	Safety A	Black	Blue	Brown
		White	Red	Blue
	Safety B	Red	—	Black
		Blue		White
	Aux A	Yellow	Yellow	
		Green	Green	
Shield Gnd	—	Green/Yellow	Green/Yellow	
8-pin Micro (M12)		—	—	
Cordset 889D-F8AB-x ⁽¹⁾	Brown White	Safety A	—	—
	Gray Pink	Safety B	—	—
	Yellow Red	Safety B	—	—
	Green Blue	NA	—	—

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



WARNING: All safety contacts fitted with internal non-resettable fuse and must be fused externally as detailed.

Table 27 - External Fuse Safety Contacts

	
FRS 2 GD2 FRS20 GD2 FRS21 GD2	AC 1.6 A ⁽¹⁾ ≤ (F) IEC 60127-2
FRS 2 GD2 FRS 20 GD2 FRS21 GD2	DC 0.4 A ⁽²⁾ ≤ (F) IEC 60127-2

(1) Recommended: Bussman BK/GDA-1.6 A

(2) Recommended: Bussman BK/GDA-400 mA

Ferrogard GS1 and GS2 Non-contact Interlock Switches

The Ferrogard GS1 and GS2 non-contact interlock switches have the following features:

- Non-contact actuation
- High tolerance to misalignment
- High switching current (2 A AC)
- Metal housings (IP68)
- Ex Range version available



Specifications

Attribute	Value	
Safety Ratings		
Standards	ISO13849-1, IEC/EN 60204-1, NFPA79, EN 1088, AS4024.1, EN 60079, EN 61241	
Safety classification	Cat. 1 Device per ISO13849-1. Dual channel interlocks suitable for Cat. 3 or 4 systems	
Functional safety data ⁽¹⁾	B10d: > 2 x 10 ⁶ operations at min. PFH _d : > 3 x 10 ⁻⁷ MTTFd: > 385 years Dual channel interlock may be suitable for performance levels PLe or PLd (according to ISO 13849-1:2006) and for use in SIL2 or SIL3 systems (according to IEC 62061) depending on application characteristics	
For up-to-date information, visit https://ab.rockwellautomation.com/safety		
Certifications		
GS1 & GS2	CE Marked for all applicable directives www.rockwellautomation.com/certification/overview.page	
GS2 Ex	EExd IIC T6 Baseefa	
Outputs (Guard Door Closed, Actuator in Place)		
Safety outputs	1 N.C.	
Auxiliary outputs	—	
Operating Characteristics		
Operating distance, make [mm (in.)]		
GS1	12 (0.47)	
GS2	15 (0.59)	
Operating distance, break [mm (in.)]		
GS1	23 (0.91)	
GS2	26 (1.02)	
Environmental		
Enclosure type rating	IP68 (NEMA 6P)	
Operating temperature [C (F)]		
GS1	-25...+125° (-13...+257°)	
GS2	-40...+60° (-40...146°)	
Relative humidity	5...95%	
Shock	IEC 68-2-27, 30 g, 11 ms	
Vibration	IEC 68-2-6, 10...55 Hz	
Radio frequency	IEC 61000-4-3, IEC 61000-4-6	
Physical Characteristics		
	GS1 Stainless Steel	GS1 Brass
Housing material	Stainless steel; BS3146 ANC4B (316L)	
Actuator material	Epoxy-painted stainless steel	
		Brass

Attribute	Value
Weight [g (lb)]	
GS1 Brass	381 (0.84)
GS1 Steel	388 (0.86)
Actuator	116 (0.24)

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

Product Selection

Safety Contact Switching Capability	Connection Type	Housing Material	Safety Contacts ⁽¹⁾	Auxiliary Contacts ⁽¹⁾	Type	Cat. No.
250V AC, 2 A	2 m Cable	Brass	1 N.C.	None	GS 1	440N-G02048
		Stainless steel				440N-G02049
	3 m Cable	Brass			GS2-Ex (brass)	440N-H02046
		Stainless steel			GS2-Ex (stainless steel)	440N-H02047

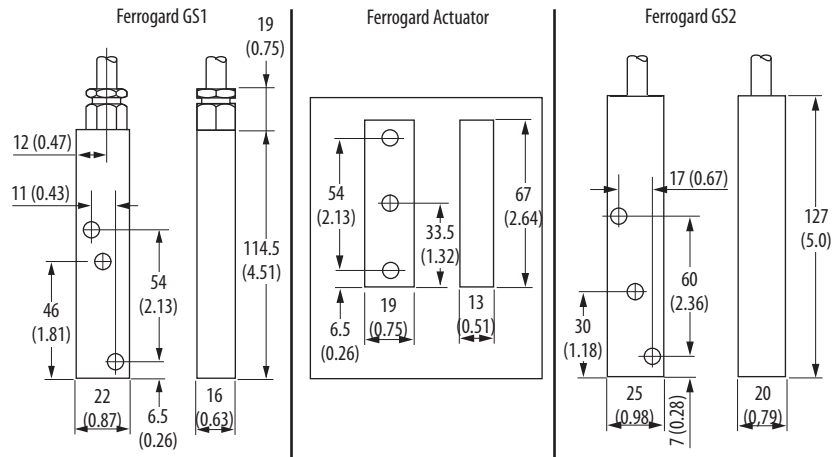
- (1) Contacts are described with the guard door closed, that is, actuator in place. Switch is shipped with complete actuator.

Accessories

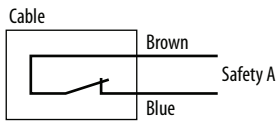
Description	Used with	Cat. No.
Actuator, Alnico	Brass Switch	440N-A02056
Actuator, Epoxy-painted	Stainless Steel	440N-A02057

Approximate Dimensions

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



Typical Wiring Diagram



WARNING: All safety contacts fitted with internal non-resettable fuse and must be fused externally as detailed.

Table 28 - External Fuse Safety Contacts

GS1	AC 1.6 A ⁽¹⁾ ≤ (F) IEC 60127-2
GS2	

(1) Recommended: Bussman BK/GDA-1.6 A

Sipha Sensors

The Sipha™ sensors have the following features:





- Non-contact actuation
- Magnetic coded sensing
- Four housing styles
- Must be operated with its own safety control unit



Specifications

Attribute	Value
Safety Ratings	
Standards	ISO13849-1, IEC/EN 60204-1, NFPA79, EN 1088, ISO14119, IEC60947-5-1, IEC/EN 60947-5-3, ANSI B11.19, AS4024.1
Safety classification	Rating dependent on control unit and application
Functional safety data	B10d: > 2 x 10 ⁶ operations at min. PFH _p : > 3 x 10 ⁻⁷ MTTFd: > 385 years
For up-to-date information, visit https://ab.rockwellautomation.com/safety	Dual channel interlock may be suitable for performance levels PLe or PLd (according to ISO 13849-1:2006) and for use in SIL2 or SIL3 systems (according to IEC 62061) depending on application characteristics
Certifications	CE Marked for all applicable directives, c-UL-us, and TÜV www.rockwellautomation.com/certification/overview.page
Outputs (Guard Door Closed, Actuator in Place)	
Auxiliary output switching	300V DC, 250V AC, 0.5 A including inrush. 15V A/10 W suitable for AC/DC circuits.
Operating Characteristics	
Sensing distance, make [mm (in.)]	
S1 and S3	5 (0.20)
S2	9 (0.35)
S4	10 (0.39)
Sensing distance, break [mm (in.)]	
S1	11 (0.43)
S2 and S3	12 (0.47)
S4	13 (0.51)
Environmental	
Enclosure type rating	IP67 (NEMA 6P)
Operating temperature [C (F)]	
S1, S2, and S3	-10...+55 ° (+14...+131 °)
S4 (GD2)	-25...+125 ° (-13...+257 °)
Shock	30 g, 11 ms half-sine
Vibration	1 mm, 10...55 Hz
Physical Characteristics	
Cable size	0.54 mm ² (20 AWG) 4-wire PVC Jacket OD: 4 mm (0.16 in.)
Material	
S1 and S2	Molded ABS
S30 (Actuator)	Polyester
S31 (Sensor)	Nylon (Trogamid)
S4 (GD2)	Stainless Steel
Mounting	Any position
Weight [g (lb)]	
S1	Sensor: 18 (0.04); Actuator: 15 (0.03)
S2	Sensor: 20 (0.04); Actuator: 30 (0.07)
S3:	Sensor: 18 (0.04) Actuator: 6 (0.01)
S4	Sensor: 150 (0.33); Actuator: 170 (0.37)

Product Selection

Housing Style	Housing Material	Safety Contacts ⁽¹⁾	Auxiliary Contacts ⁽¹⁾	Type	Connection	Cat. No.
 S1	ABS plastic	1 N.C. and 1 N.O.	None	S11	3 m Cable	440N-S32014
					10 m Cable	440N-S32016
			1 N.C.	S12	3 m Cable	440N-S32022
					10 m Cable	440N-S32032
			1 N.O.	S13	3 m Cable	440N-S32037
					10 m Cable	440N-S32036
			None	S21	3 m Cable	440N-S32015
					10 m Cable	440N-S32017
 S2	ABS plastic	1 N.C. and 1 N.O.	1 N.C.	S22	3 m Cable	440N-S32023
					10 m Cable	440N-S32033
			1 N.O.	S23	3 m Cable	440N-S32038
					10 m Cable	440N-S32039
 S3	Actuator— Polyester Sensor— Nylon (Trogamid)	None	S31	3 m Cable	440N-S32101	
				4-pin Micro (M12)	440N-S32024	
 S4	Stainless Steel	1 N.C. and 1 N.O.	1 N.C.	S42	8-pin Micro (M12)	440N-S32047
					3 m Cable	440N-S32055
					10 m Cable	440N-S32056
			1 N.O.	S43	8-pin Micro (M12)	440N-S32046
					3 m Cable	440N-S32053
					10 m Cable	440N-S32054

(1) Contacts are described with the guard door closed, that is, actuator in place. Switch is shipped complete with actuator.




Table 29 - Connection Systems

Description	4-pin Micro (M12)	8-pin Micro (M12)
Cordset	889D-F4ECA-x ⁽¹⁾	889D-F8AB-x ⁽¹⁾
Patchcord	889D-F4ECRM-y ⁽²⁾	889D-F8ABDM-y ⁽²⁾

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

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

Recommended Logic Interface

Housing	Supply Voltage	Safety Contacts	Auxiliary Contacts	Housing Width [mm (in.)]	Type	Cat. No.
	24V AC/DC	1 N.O.	1 N.C. Solid State	22.5 (0.89)	Control Unit 1	440N-S32013
	24V AC/DC; 115/ 230V AC	2 N.O.	1 N.C.	45 (1.77)	Control Unit 2	440N-S32021
	24V AC/DC; 115/ 230V AC	2 N.O. and 1 N.O. delayed	1 N.C.	90 (3.54)	Sipha 6	440N-S32052

Accessories

Description	Cat. No.
Actuator S10	440N-A32019
Actuator S20	440N-A32020
Actuator S30	440N-A32025
Actuator S40 (GD2)	440N-A32041
Bag of 40 washers for S2 models	440N-A17127

Approximate Dimensions

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

Figure 18 - Sipha S1

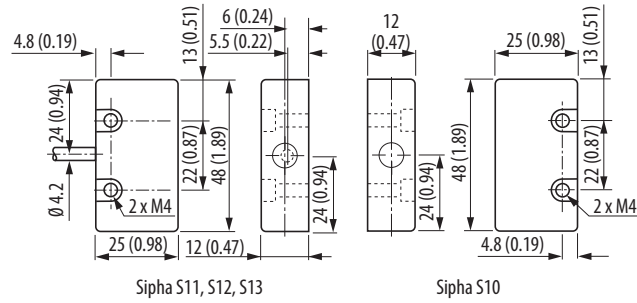


Figure 19 - Siphon S2

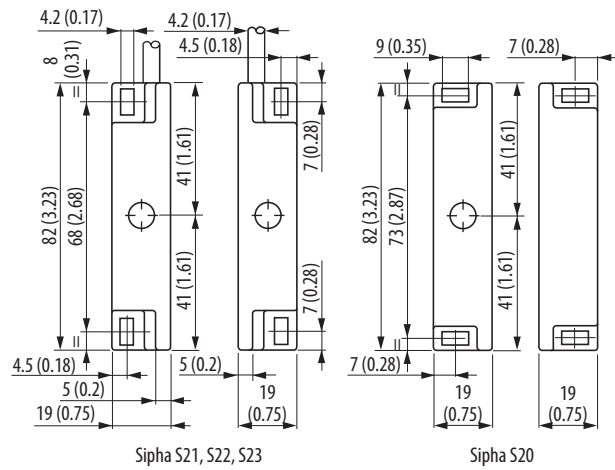


Figure 20 - Siphon S3

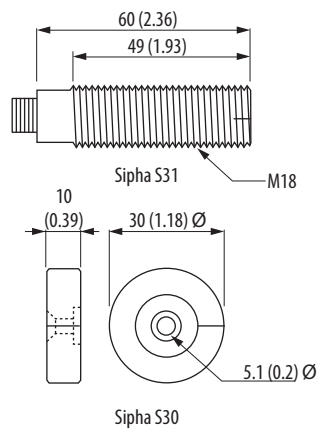
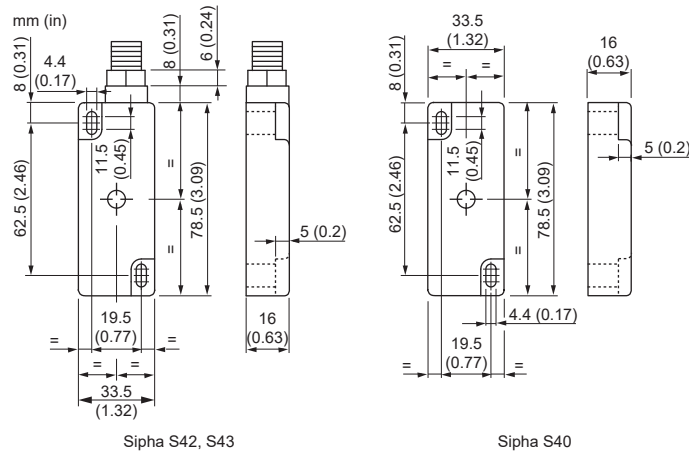


Figure 21 - Sipa S4



Typical Wiring Diagrams

Table 30 - S11, S21, S42, S12, S22, S43, S13, and S23

Description		S11 and S21 1 N.O. and 1 N.C.	S42, S12, and S22 2 N.C. and 1 N.O.	S43, S13, and S23 1 N.C. and 2 N.O.
Cable Versions	Red	Safety A_N.C.	Safety A_N.C.	Safety A_N.C.
	Blue			
	Yellow	Safety B_N.O.	Safety B_N.O.	Safety B_N.O.
	Green			
	Black	—	Aux A_N.C.	Aux A_N.O.
	White	—	External Ground	External Ground
	Green/Yellow	—	External Ground	External Ground

Table 31 - S31, S42, and S43

Description		S31	S42	S43
4-pin Micro (M12)			—	—
8-pin Micro (M12)		—		
4-pin Cordset 889D-F4AC-x ⁽¹⁾	Brown	Safety A_N.C.	—	—
	Blue			
	White	Safety B_N.O.	—	—
	Black			

Table 31 - S31, S42, and S43

Description		S31	S42	S43
8-pin Cordset 889D-F8AB-x ⁽¹⁾	White Brown	Safety A	Safety A_N.C.	Safety A_N.C.
	Red Yellow	Safety B	Safety B_N.O.	Safety B_N.O.
	Gray Pink	Aux A	Aux A_N.C.	Aux A_N.O.
	Green Blue	NA	Gnd	Gnd

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

Tongue Interlock Switches

Bulletin Number 440K

Topic	Page
Elf Miniature Tongue Interlock Switches	82
Cadet 3 Tongue Interlock Switches	87
Trojan T15 Tongue Interlock Switches	91
Trojan 5 and 6 Universal Tongue Interlock Switches	96
MT-GD2 Tongue Interlock Switches	102

Elf Miniature Tongue Interlock Switches

The Elf™ Miniature Tongue Interlock Switches have the following features:

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



Specifications

Attribute	440K-E			
Safety Ratings				
Standards	ISO 14119, IEC 60947-5-1			
Safety classification	Type 2 Interlocking Device per ISO 14119			
Functional safety data	Visit http://literature.rockwellautomation.com/idc/groups/literature/documents/sr/safety-sr001_-en-e.pdf			
Certifications	c-UL-us Listed, TÜV Certified, and CE Marked for all applicable directives www.rockwellautomation.com/certification/overview.page			
Outputs				
Safety contacts ⁽¹⁾ Direct Opening Action	1 N.C.		2 N.C.	
Auxiliary contacts	1 N.O.		None	
Thermal current/ _{I_{th}}	5 A (10 A if A600)			
Rated insulation voltage	2500V			
Switching current @ voltage, min	3 mA @ 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				
Break contact force	6 N (1.35 lbf), min			
Actuation speed	160 mm (6.29 in.)/s, max			
Actuation frequency	2 cycles/s, max			

Attribute	440K-E
Operating radius	150 mm (5.9 in.) [60 mm (2.36 in.) with GD2 kit], min
Mechanical life	1,000,000 operations
Environmental	
Enclosure type rating	IP67
Operating temperature	-20...+80 °C (-4...+176 °F)
Physical Characteristics	
Housing material	UL approved glass-filled PBT
Actuator material	Stainless steel
Weight	60 g (2.11 oz)
Color	Red

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

Product Selection

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

(1) For connector ratings, see [Table 33](#).

(2) With a 5-pin micro (M12) connector, not all contacts are connected. See [Typical Wiring Diagrams](#) on page 85 for wiring details.

Table 32 - Connection Systems

Description	Cat. No.		
	Connection to Distribution Box 4-pin Micro (M12)		Connection to ArmorBlock Guard I/O 5-pin Micro (M12)
	1 N.C. & 1 N.O.	2 N.C.	2 N.C.
Cordset	889D-F4AC-x ⁽¹⁾	889D-F4AC-x ⁽¹⁾	—
Patchcord	889D-F4ACDM-y ⁽²⁾	889D-F4ACDM-y ⁽²⁾	889D-F5ACDM-x ⁽¹⁾
Distribution Box	898D-P4z KT-DM4 ⁽³⁾	898D-4z LT-DM4 ⁽³⁾	—
Shorting Plug	898D-41KU-DM	898D-41LU-DM	—
T-Port	898D-43KY-D4	898D-43LY-D4	—

(1) Replace x with 2 [2 m (6.56 ft)], 5 [5 m (16.4 ft)], or 10 [10 m (32.8 ft)] for standard cable lengths.




(2) Replace y with 1 [1 m (3.28 ft)], 2 (2 m), 3 [3 m (9.8 ft)], 5 (5 m), or 10 (10 m) for standard cable lengths.




(3) Replace z with 4 or 8 for number of ports.

Table 33 - Connector Ratings

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

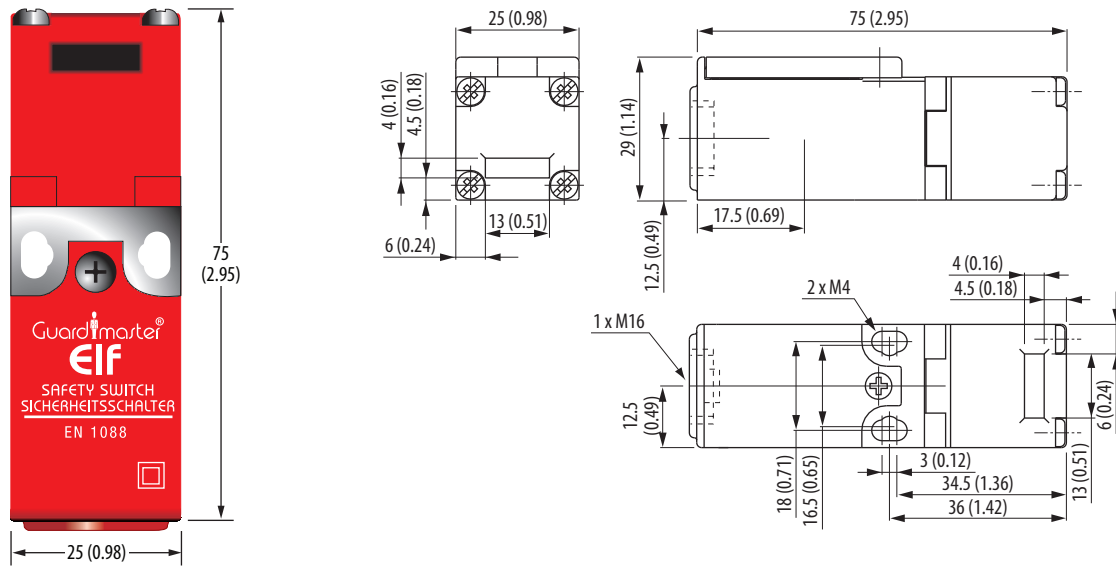
Accessories

Description	Cat. No.
 Flat actuator, not to be used with metal alignment guide	440K-A21014
 90° actuator, not to be used with metal alignment guide	440K-A21006
 Metal alignment guide with semi-flexible actuator	440K-A21030

Description	Cat. No.
 Metal Alignment Guide	440K-A21069
 Replacement Cover	440A-A33085
 Dust Cover	440K-A17182

Approximate Dimensions

Dimensions are shown in mm (in.). Dimensions are not intended to be used for installation purposes. 2D, 3D, and electrical drawings are available on <https://ab.rockwellautomation.com/>.



Typical Wiring Diagrams

Description	1 N.C. & 1 N.O.	1 N.C.
Contact Configuration		
Contact Action □ Open ■ Closed		
4-pin Micro (M12)		
5-pin Micro (M12) For ArmorBlock Guard I/O	—	

Description		1 N.C. & 1 N.O.	1 N.C.
Cordset 889D-F4AC-x ⁽¹⁾	Brown	Safety A	Safety A
	Blue		
	White	Aux A	Safety B
	Black		

(1) Replace x with 2 [2 m (6.56 ft)], 5 [5 m (16.4 ft)], or 10 [10 m (32.8 ft)] for standard cable lengths.

Cadet 3 Tongue Interlock Switches

The Cadet™ 3 tongue interlock switches have the following features:

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



Specifications

Attribute	Value			
Safety Ratings				
Standards	ISO 14119, IEC 60947-5-1			
Safety classification	Type 2 Interlocking Device per ISO 14119			
Functional safety data	Visit http://literature.rockwellautomation.com/idc/groups/literature/documents/sr/safety-sr001_-en-e.pdf			
Certifications	c-UL-us Listed, TÜV Certified, and CE Marked for all applicable directives www.rockwellautomation.com/certification/overview.page			
Outputs				
Safety contacts ⁽¹⁾ Direct Opening Action	2 N.C.		3 N.C.	
Auxiliary contacts	1 N.O.		None	
Thermal current/ <i>I_{th}</i>	10 A			
Rated insulation voltage (U _i)	500V			
Switching current @ voltage	3 mA @ 18V DC, min			
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				
Break contact force	15 N (3.37 lbf), min			
Actuation speed	160 mm (6.29 in.)/s, max			
Actuation frequency	2 cycles/s, max			
Operating radius	150 mm (5.9 in.) [60 mm (2.36 in.) with GD2 kit], min			
Mechanical Life	1,000,000 operations			
Environmental				
Enclosure type rating	IP67			
Operating temperature	-20...+80 °C (-4...+176 °F)			
Physical Characteristics				
Housing material	UL approved glass-filled PBT			
Actuator material	Stainless steel			
Weight	80 g (0.176 lb)			
Color	Red			

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

Product Selection

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

(1) For connector ratings, see [Table 33](#) on [page 84](#).

(2) With a 5-pin micro (M12) connector, not all contacts are connected. See [Typical Wiring Diagrams](#) on [page 90](#) for wiring details.




Table 34 - Connection Systems



Description	Cat. No.	
	6-pin Micro (M12)	5-pin Micro (M12)
Cordset	889R-F6ECA-x ⁽¹⁾	—
Patchcord	889R-F6ECRM-y ⁽²⁾	889D-F5ACDM-x ⁽¹⁾
Distribution box	889R-P68MT-A5	—
Shorting plug	889R-P61MU-RM	—

(1) Replace x with 2 [2 m (6.56 ft)], 5 [5 m (16.4 ft)], or 10 [10 m (32.8 ft)] for standard cable lengths.

(2) Replace y with 1 [1 m (3.28 ft)], 2 (2 m), 3 [3 m (9.8 ft)], 5 (5 m), or 10 (10 m) for standard cable lengths.

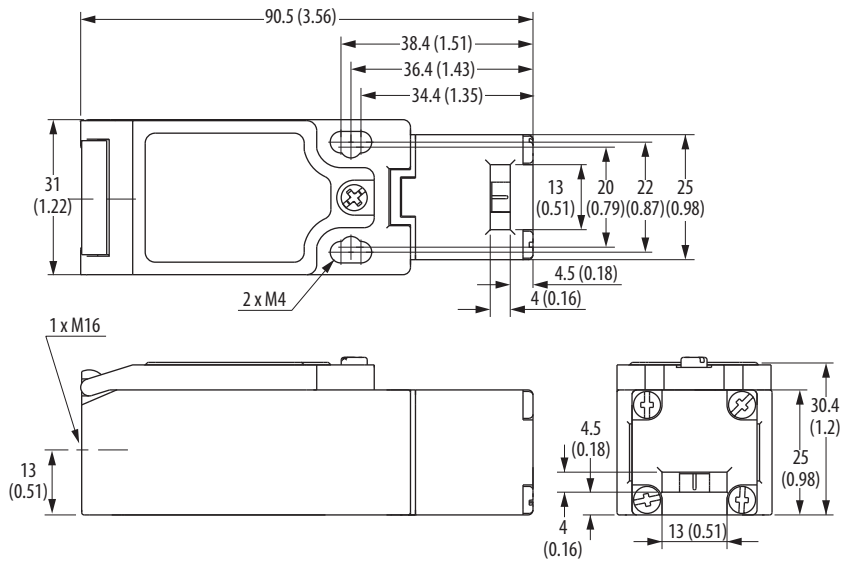
Accessories

Description		Cat. No.
	Flat actuator, not to be used with metal alignment guide	440K-A21014
	90° actuator, not to be used with metal alignment guide	440K-A21006
	Metal alignment guide with semi-flexible actuator	440K-A21030

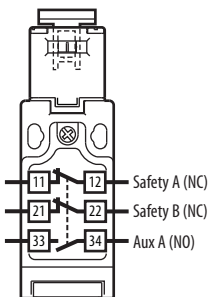
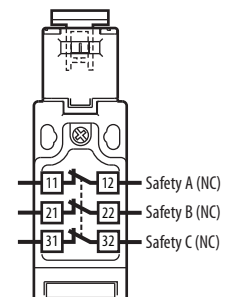
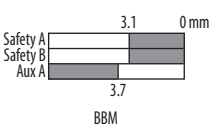
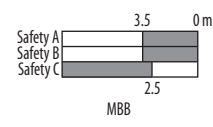
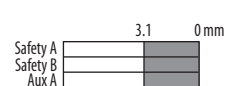
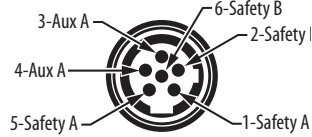
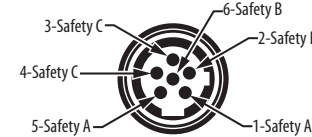
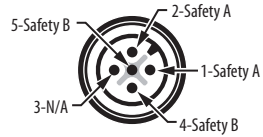
Description		Cat. No.
	Replacement cover	440A-A21115
	Dust cover	440K-A17182
—	—	—

Approximate Dimensions

Dimensions are shown in mm (in.). Dimensions are not intended to be used for installation purposes. 2D, 3D, and electrical drawings are available on <https://ab.rockwellautomation.com/>.



Typical Wiring Diagrams

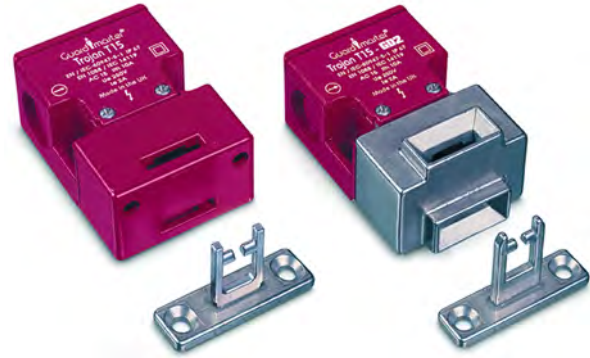
Description		2 N.C. & 1 N.O.	3 N.C.
Contact Configuration			
Contact Action □ Open ■ Closed		 	
6-pin Micro (M12)			
5-pin Micro (M12)		—	
Cordset 889R-F6ECA-x ⁽¹⁾	Red/White	Safety A	Safety A
	Red/Black	Safety A	Safety A
	Red	Safety B	Safety B
	Red/Blue	Safety B	Safety B
	Green	Aux A	Safety C
	Red/Yellow	Aux A	Safety C

(1) Replace x with 2 [2 m (6.56 ft)], 5 [5 m (16.4 ft)], or 10 [10 m (32.8 ft)] for standard cable lengths.

Trojan T15 Tongue Interlock Switches

The Trojan T15 tongue interlock switches have the following features:

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



Specifications

Attribute	Value			
Safety Ratings				
Standards	ISO 14119, IEC 60947-5-1			
Safety classification	Type 2 Interlocking Device per ISO 14119			
Functional safety data	Visit http://literature.rockwellautomation.com/idc/groups/literature/documents/sr/safety-sr001_-en-e.pdf			
Certifications	c-UL-us Listed, TÜV Certified, and CE Marked for all applicable directives www.rockwellautomation.com/certification/overview.page			
Outputs				
Safety contacts ⁽¹⁾ Direct Opening Action	2 N.C.		2 N.C.	
Auxiliary contacts	None		1 N.O.	
Thermal current/ I_{th}	10 A			
Rated insulation voltage (Ui)	2500V			
Switching current @ voltage	3 mA @ 18V DC, min			
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				
Break contact force	30 N (6.70 lbf), min			
Actuation speed	160 mm (6.29 in.)/s, max			
Actuation frequency	2 cycles/s, max			
Operating radius	175 mm (6.89 in.) [60 mm (2.36 in.) with GD2 kit], min			
Mechanical life	1,000,000 operations			
Environmental				
Enclosure type rating	IP67			
Operating temperature	-20...+80 °C (-4...+176 °F)			
Physical Characteristics				
Housing material	UL approved glass-filled PBT			
Actuator material	Stainless Steel			
Weight	120 g (0.265 lb)			
Color	Red			

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

Product Selection

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

(1) For connector ratings, see [Table 33](#) on [page 84](#).

Table 35 - Connection Systems

Description	Cat. No.		
	Connection to Distribution Box 4-pin Micro (M12)		Connection to ArmorBlock Guard I/O 5-pin Micro (M12)
	1 N.C. & 1 N.O.	2 N.C.	2 N.C.
Cordset	889D-F4AC-x ⁽¹⁾	889D-F4AC-x ⁽¹⁾	—
Patchcord	889D-F4ACDM-y ⁽²⁾	889D-F4ACDM-y ⁽²⁾	889D-F5ACDM-x ⁽¹⁾
Distribution Box	898D-P4z KT-DM4 ⁽³⁾	898D-4z LT-DM4 ⁽³⁾	—
Shorting Plug	898D-41KU-DM	898D-41LU-DM	—
T-Port	898D-43KY-D4	898D-43LY-D4	—

(1) Replace x with 2 [2 m (6.56 ft)], 5 [5 m (16.4 ft)], or 10 [10 m (32.8 ft)] for standard cable lengths.

(2) Replace y with 1 [1 m (3.28 ft)], 2 [2 m], 3 [3 m (9.8 ft)], 5 [5 m], or 10 [10 m] for standard cable lengths.

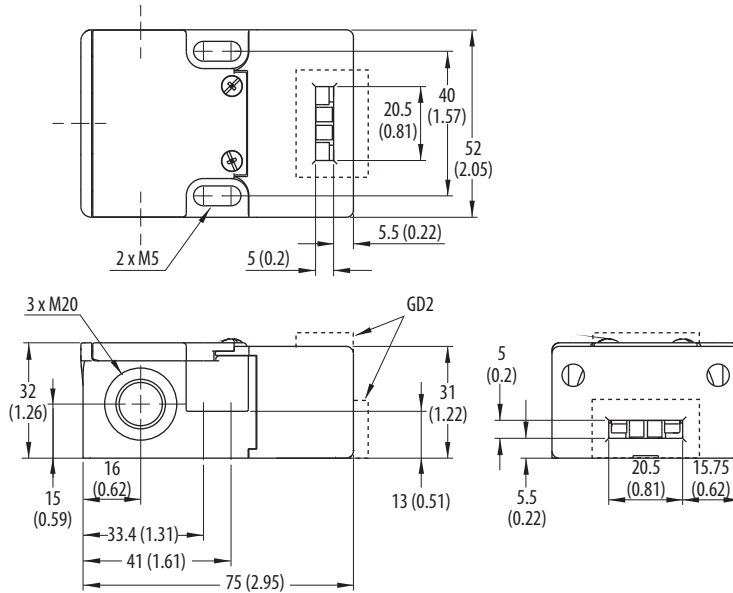
(3) Replace z with 4 or 8 for number of ports.

Accessories

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

Approximate Dimensions

Dimensions are shown in mm (in.). Dimensions are not intended to be used for installation purposes. 2D, 3D, and electrical drawings are available on <https://ab.rockwellautomation.com/>.



Typical Wiring Diagrams

Description	1 N.C. & 1 N.O.	1 N.C.
Contact Configuration	<p>Safety A (NC) Aux A (NO)</p>	<p>Safety A (NC) Safety B (NC)</p>
Contact Action □ Open ■ Closed	<p>20 15 10 6 0 mm Safety A Aux A BBM</p>	<p>20 15 10 6 0 mm Safety A Safety B</p>
4-pin Micro (M12)	<p>1-Safety A 2-Aux A 3-Safety A 4-Aux A</p>	<p>1-Safety A 2-Safety B 3-Safety A 4-Safety B</p>
5-pin Micro (M12)	—	<p>1-Safety A 2-Safety A 3-N/A 4-Safety B 5-Safety B</p>

Description		1 N.C. & 1 N.O.	1 N.C.
Cordset 889D-F4AC-x ⁽¹⁾	Brown	Safety A	Safety A
	Blue		
	White	Aux A	Safety B
	Black		

(1) Replace x with 2 [2 m (6.56 ft)], 5 [5 m (16.4 ft)], or 10 [10 m (32.8 ft)] for standard cable lengths.

Trojan 5 and 6 Universal Tongue Interlock Switches

The Trojan™ 5 and 6 Universal Tongue Interlock Switches have the following features:

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



Specifications

Attribute	Value			
Safety Ratings				
Standards	ISO 14119, IEC 60947-5-1			
Safety Classification	Type 2 Interlocking Device per ISO 14119			
Functional Safety Data	Visit http://literature.rockwellautomation.com/idc/groups/literature/documents/sr/safety-sr001_-en-e.pdf			
Certifications	c-UL-us Listed, TÜV Certified, and CE Marked for all applicable directives www.rockwellautomation.com/certification/overview.page			
Outputs				
Safety Contacts ⁽¹⁾ Direct Opening Action	3 N.C.	2 N.C.	2 N.C.	
Auxiliary Contacts	1 N.O.	2 N.O.	1 N.O.	
Thermal Current/ <i>I_{th}</i>	10 A			
Rated Insulation Voltage (Ui)	500V			
Switching Current @ Voltage	3 mA @ 18V DC, min			
Utilization Category: Trojan 5 Switch				
A300/AC-15 (Ue)	240V	120V		
A300/AC-15 (Ie)	3 A	6 A		
DC-13 (Ue)	24V	24V		
DC-13 (Ie)	2 A			
Utilization Category: Trojan 6 Switch				
A600/AC-15 (Ue)	600V	500V	240V	120V
A600/AC-15 (Ie)	1.2 A	1.4 A	3 A	6 A
DC-13 (Ue)	24V			
DC-13 (Ie)	2 A			
Operating Characteristics				
Break contact Force				
Trojan 5 switch	12 N (2.7 lbf) & 30 N (6.75 lbf)			
Trojan 6 switch	20 N (4.5 lbf)			
Actuation Speed	160 mm (6.29 in.)/s, max			
Actuation Frequency	2 cycles/s, max			
Operating Radius	175 mm (6.89 in.) [60 mm (2.36 in.) with flexible actuator], min			
Mechanical Life	1,000,000 operations			
Environmental				
Enclosure Type Rating	IP67			
Operating Temperature	-20...+80 °C (-4...+176 °F)			

Attribute	Value
Physical Characteristics	
Housing Material	UL approved glass-filled PBT
Actuator Material	Stainless Steel
Weight [g (lb)]	160 (0.35)
Color	Red

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

Product Selection

Table 36 - Trojan 5 Switch

Type	Contact			Actuator Type	Cat. No.						
	Safety	Auxiliary	Action		M20 Conduit		Connector ⁽¹⁾				
					M20	1/2 inch NPT Adapter	Connect to Distribution Box 4-pin Micro (M12)	Connect to ArmorBlock Guard I/O 5-pin Micro (M12) ⁽²⁾			
Trojan 5 Standard Switch	2 N.C.	1 N.O.	BBM	Standard	440K-T11090	440K-T11202	440K-T11205	—			
				Guide/semi-flexible	440K-T11110	440K-T11203	440K-T11206	—			
				Guide/fully flexible	440K-T11467	440K-T11204	440K-T11207	440K-T2NNBPS			
				—	440K-T11089	—	440K-T11129	—			
			BBM Gold Contacts	Standard	440K-T11085	—	—	—			
				—	—	—	—	—			
			MBB	Standard	440K-T11118	440K-T11208	440K-T11224	—			
				Guide/semi-flexible	440K-T11123	440K-T11209	440K-T11363	—			
				Guide/fully flexible	440K-T11468	440K-T11210	440K-T11364	—			
				—	440K-T11146	440K-T11469	440K-T11365	—			
			Trojan 5 GD2 Switch	2 N.C.	1 N.O.	BBM	GD2 standard	440K-T11336	440K-T11211	440K-T11366	440K-T2NNGPS-NG
							Guide/semi-flexible	440K-T11337	440K-T11212	440K-T11367	—
Guide/fully flexible	440K-T11338	440K-T11213					440K-T11368	—			
—	440K-T11147	—					440K-T11226	—			
MBB	GD2 standard	440K-T11339				440K-T11470	440K-T11369	—			
	Guide/semi-flexible	440K-T11340				440K-T11471	440K-T11370	—			
	Guide/fully flexible	440K-T11341				440K-T11472	440K-T11371	—			
	—	440K-T11167				—	440K-T11372	—			
Trojan 5 30 N Switch	2 N.C.	1 N.O.				BBM	Standard	440K-T11333	440K-T91024	440K-T11492	—
							—	—	—	—	—

(1) For connector ratings, see [Table 33](#) on [page 84](#).

(2) With a 5-pin micro (M12) connector, not all contacts are connected. See [Typical Wiring Diagrams](#) on [page 101](#) for wiring details.

Table 37 - Trojan 6 Switch

Type	Contact			Actuator Type	Cat. No.			
	Safety	Auxiliary	Action		M20 Conduit		Connector ⁽¹⁾	
					M20	1/2 inch NPT Adapter	8-pin Micro (M12) ⁽²⁾	
Trojan 6 Switch	3 N.C.	1 N.O.	BBM	Standard	440K-T11171	440K-T11435	—	
				—	440K-T11449	440K-T11408	—	
	2 N.C.	2 N.O.	BBM	Standard	440K-T11174	440K-T11438	—	
				—	440K-T11452	440K-T11416	440K-W21BNPH	
				MBB	—	440K-T11453	440K-T11454	440K-W21MNPB
					—	—	—	—
Trojan 6 GD2 Switch	3 N.C.	1 N.O.	BBM	GD2 Standard	440K-T11418	440K-T11466	—	
				—	440K-T11188	440K-T11444	—	
			MBB	—	440K-T11456	440K-T11457	—	
	BBM	GD2 Standard		440K-T11445	440K-T11425	—		
		—		440K-T11459	440K-T11433	440K-W21BNPH-NG		
	MBB	—	440K-T11460	440K-T11461	440K-W21MNPB-NG			

(1) For connector ratings, see [Table 33](#) on [page 84](#).

(2) With an 8-pin micro (M12) connector, not all contacts are connected. See [Typical Wiring Diagrams](#) on [page 101](#) for wiring details.

Table 38 - Connection Systems

Description	Cat. No.		
	Trojan 5 Switch		Trojan 6 Switch
	5-pin Micro (M12)	6-pin Micro (M12)	8-pin Micro (M12)
Cordset	—	889R-F6ECA-x ⁽¹⁾	889D-F8AB-x ⁽¹⁾
Patchcord	889D-F5ACDM-x ⁽¹⁾	889R-F6ECRM-y ⁽²⁾	889D-F8ABDM-y ⁽²⁾
Distribution Box	—	898R-F68MT-A5	—
Shorting Plug	—	898R-P61MU-RM	—
T-Port	—	—	—

(1) Replace x with 2 [2 m (6.56 ft)], 5 [5 m (16.4 ft)], or 10 [10 m (32.8 ft)] for standard cable lengths.

(2) Replace y with 1 [1 m (3.28 ft)], 2 [2 m], 3 [3 m (9.8 ft)], 5 [5 m], or 10 [10 m] for standard cable lengths.

Accessories

Description	To Be Used With	Cat. No.
 <p>Standard actuator</p>	Trojan 5 and Trojan 6. Not to be used with GD2 models.	440K-A11095
 <p>GD2 standard actuator</p>	GD2 models only	440G-A27011
 <p>GD2 flat actuator</p>	GD2 models only.	440K-A11112
 <p>Alignment guide with semi-flexible actuator</p>	Discard alignment guide for GD2 models.	440K-A11144
 <p>Alignment guide with fully flexible actuator</p>	Discard alignment guide for GD2 models.	440K-A27010
 <p>Sliding bolt actuator</p>	GD2 models only.	440G-A27163
 <p>Catch and Retainer Kit</p>	Trojan 5 and Trojan 6. Not to be used with GD2 models.	440K-A11094
 <p>Replacement Cover</p>	Trojan T5 standard model only.	440A-A11495
	Trojan T5 GD2.	440A-A11496
	Trojan T6 standard model only.	440A-A11497
	Trojan T6 GD2.	440A-A11498
 <p>Dust Cover</p>	All models.	440K-A17180

Approximate Dimensions

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

Figure 22 - Standard Model

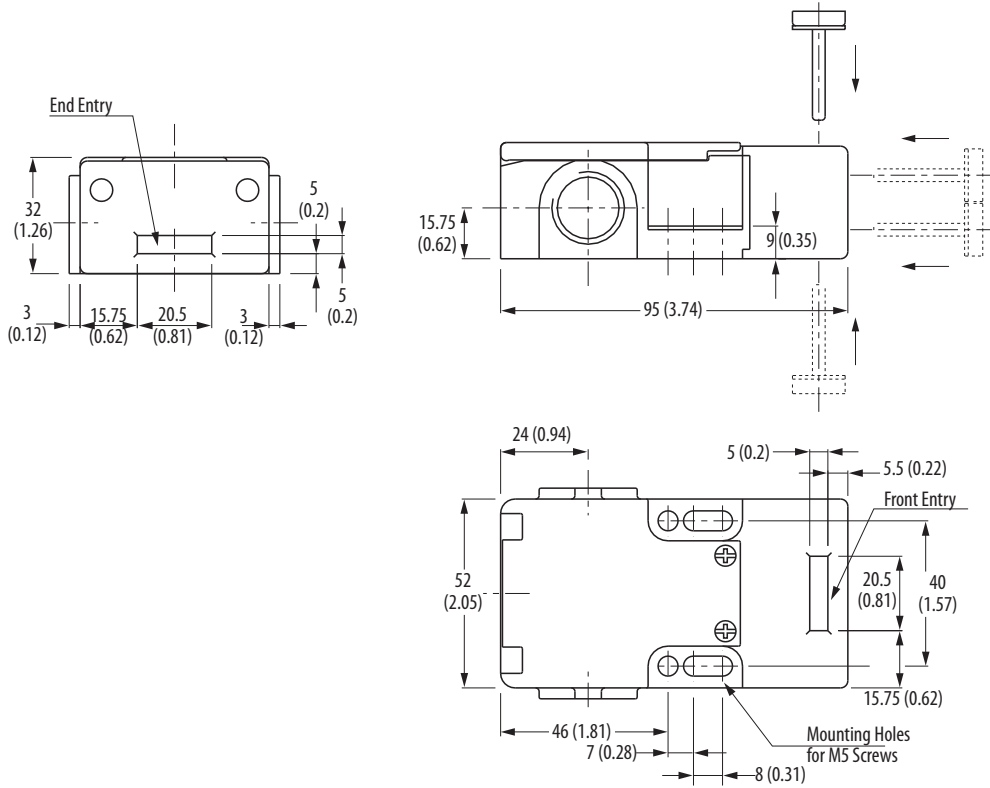
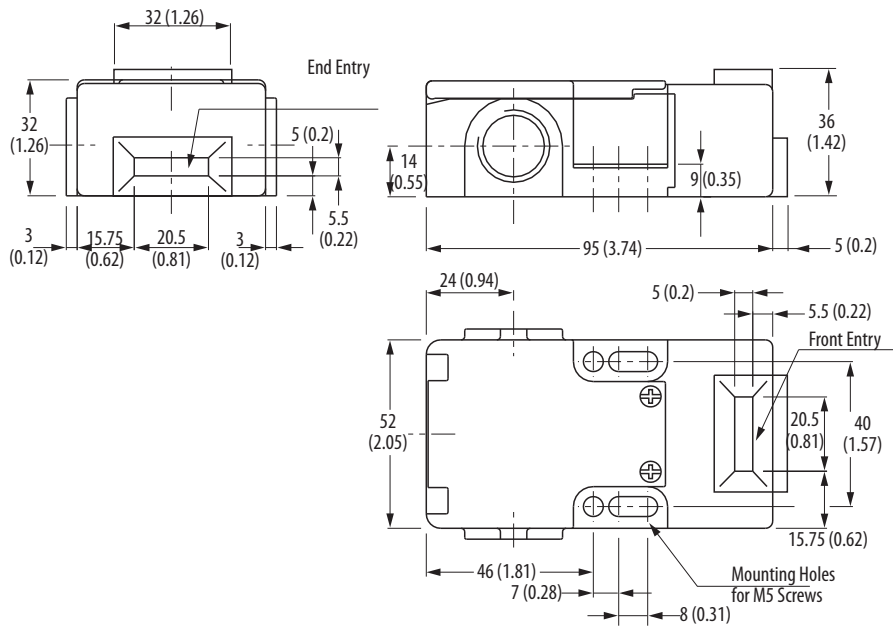


Figure 23 - GD2 Model



Typical Wiring Diagrams

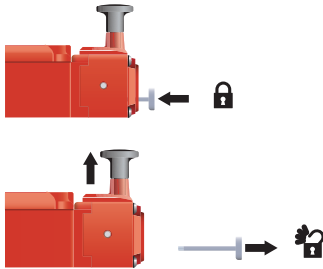
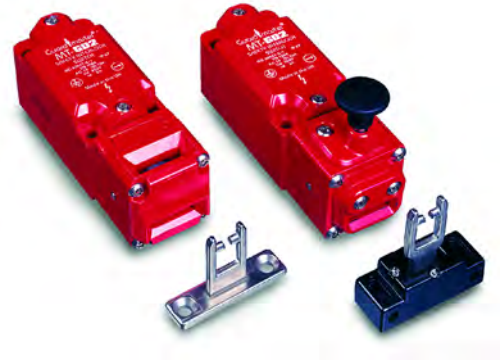
Description	Trojan 5		Trojan 6	
	2 N.C. & 1 N.O.		2 N.C. & 2 N.O.	3 N.C. & 1 N.O.
Contact Configuration				
Contact Action				
6-pin Micro (M12)			—	—
5-pin Micro (M12) for ArmorBlock Guard I/O			—	—
8-pin Micro (M12)	—			—
6-pin Cordset 889R-F6ECA-x ⁽¹⁾	Red/White	Safety A	—	—
	Red/Black	Safety A	—	—
	Red	Safety B	—	—
	Red/Blue	Safety B	—	—
	Green	Aux	—	—
8-pin Cordset 889D-F8AB-x ⁽¹⁾	Gray Red	—	Safety A	—
	Yellow Pink	—	Safety B	—
	White Blue	—	Aux A	—
	Green Brown	—	—	—

(1) Replace x with 2 [2 m (6.56 ft)], 5 [5 m (16.4 ft)], or 10 [10 m (32.8 ft)] for standard cable lengths.

MT-GD2 Tongue Interlock Switches

The MT-GD2 tongue interlock switches have the following features:

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



MT-GD2 Latch Release Style

Specifications

Attribute	Value			
Safety Ratings				
Standards	ISO 14119, IEC 60947-5-1			
Safety classification	Type 2 Interlocking Device per ISO 14119			
Functional safety data	Visit http://literature.rockwellautomation.com/idc/groups/literature/documents/sr/safety-sr001_en-e.pdf			
Certifications	c-UL-us Listed, TÜV Certified, and CE Marked for all applicable directives www.rockwellautomation.com/certification/overview.page			
Outputs				
Safety contacts ⁽¹⁾	Standard: 3 N.C. or 2 N.C. direct opening action Snap acting: 2 N.C. direct opening forced disconnection			
Auxiliary Contacts				
Standard	1 N.O. or 2 N.O.			
Snap acting	2 N.O.			
Thermal current/ I_{th}	10 A			
Rated insulation voltage (Ui)	500V			
Switching current @ voltage	3 mA @ 18V DC, min			
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
Standard: DC-13 (Ue)	24V			
Standard: DC-13 (Ie)	2 A			
Snap-acting: A300/AC-15 (Ue)	240V	120V		
Snap-acting: A300/AC-15 (Ie)	3 A	6 A		
Snap-acting: DC-13 (Ue)	24V			
Snap-acting: DC-13 (Ie)	2 A			
Operating Characteristics				

Attribute	Value
Break contact force, min	
BBM and MBB	12 N (2.7 lbf)
BBM and extended flat actuator	32 N (7.2 lbf)
Snap acting	40 N (9.0 lbf)
Actuation speed	160 mm (6.29 in.)/s, max
Actuation frequency	2 cycles/s, max
Mechanical life	1,000,000 operations
Environmental	
Enclosure type rating	IP67
Operating temperature	-20...+80 °C (-4...+176 °F)
Physical Characteristics	
Housing material	Painted zinc
Actuator material	Stainless Steel
Weight	520 g (1.15 lb)
Color	Yellow or red

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

Product Selection

Table 39 - Red Body Switches

Type	Contact			Actuator Type	Cat. No.					
	Safety	Auxiliary	Action		Conduit		Connector ⁽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⁾	
MT-GD2	3 N.C.	1 N.O.	BBM	—	440K-MT55002	440K-MT55085	440K-MT55094	—	—	
				GD2 standard	440K-MT55074	440K-MT55022	440K-MT55095	—	—	
				Fully flexible	440K-MT55075	440K-MT55029	440K-MT55096	—	—	
			MBB	—	440K-MT55004	440K-MT55088	440K-MT55100	—	—	
				BBM	—	440K-MT55005	440K-MT55086	440K-MT55097	440K-M21BNDH	—
					GD2 standard	440K-MT55076	440K-MT55026	440K-MT55098	—	—
	Fully flexible	440K-MT55077	440K-MT55087		440K-MT55099	—	—			
	2 N.C.	2 N.O.	MBB	—	440K-MT55006	440K-MT55089	440K-MT55101	—	—	
				Snap Acting	—	—	440K-M22ANDT	440K-M22ANDL	440K-M21ANDH	440K-M2NNNDS
					Extended flat	440K-M22AEDM	440K-M22AEDT	—	—	—
			GD2 standard		440K-M22ASDM	440K-M22ASDT	—	—	—	
			Fully flexible	440K-M22ABDM	440K-M22ABDT	—	—	—		
MT-GD2 Latch Release			3 N.C.	1 N.O.	BBM	—	440K-MT55039	440K-MT55062	440K-MT55042	—
	GD2 standard	440K-MT55078				440K-MT55041	440K-MT55070	—	—	
	Fully flexible	440K-MT55079				440K-MT55045	440K-MT55103	—	—	
	MBB	—			440K-MT55082	440K-MT55091	440K-MT55106	—	—	
		BBM			—	440K-MT55063	440K-MT55065	440K-MT55066	440K-M21BNDH-N5	440K-M2NNNDS-N5
					GD2 standard	440K-MT55080	440K-MT55050	440K-MT55104	—	—
	Fully flexible		440K-MT55081	440K-MT55051	440K-MT55052	—	—			
	2 N.C.	2 N.O.	MBB	—	440K-MT55083	440K-MT55092	440K-MT55105	440K-M21MNDH-N5	—	

(1) For connector ratings, see Table 33 on page 84.

- (2) With an 8-pin micro (M12) connector, not all contacts are connected. See [Typical Wiring Diagrams](#) on page 105 for wiring details.
- (3) With a 5-pin micro (M12) connector, not all contacts are connected. See [Typical Wiring Diagrams](#) on page 105 for wiring details.

Table 40 - Yellow Body Switches

Type	Contact			Actuator Type	Cat. No.		
	Safety	Auxiliary	Action		Conduit	Connector ⁽¹⁾	
					1/2-inch NPT	12-pin M23	5-pin Micro (M12) ⁽²⁾
MT-GD2	2 N.C.	2 N.O.	Snap Acting	—	440K-M22ANYT	—	—
				Extended flat	440K-M22AEYT	440K-M22AEYL	440K-M2NAEYS
—	2 N.C.	2 N.O.	MBB	—	440K-M22MNYT-N5	—	440K-M2NNYS-N5




- (1) For connector ratings, see [Table 33](#) on [page 84](#).
- (2) With a 5-pin micro (M12) connector, not all contacts are connected. See [Typical Wiring Diagrams](#) on page 105 for wiring details.




Table 41 - Connection Systems

Description	Cat. No.			
	4-pin Micro (M12)	5-pin Micro (M12)	8-pin Micro (M12)	12-pin M23
Cordset	889D-F4AC-x ⁽¹⁾	—	889D-F8AB-x ⁽¹⁾	889M-F12X9AE-x ⁽¹⁾
Patchcord	889D-F4ACDM-y ⁽²⁾	889D-F5ACDM-x ⁽¹⁾	889D-F8ABDM-y ⁽²⁾	—
Distribution Box	898D-P4z LT-DM4 ⁽³⁾	—	—	—
Shorting Plug	898D-41LU-DM	—	—	—
T-Port	898D-43LY-D4	—	—	—

- (1) Replace x with 2 [2 m (6.56 ft)], 5 [5 m (16.4 ft)], or 10 [10 m (32.8 ft)] for standard cable lengths.
- (2) Replace y with 1 [1 m (3.28 ft)], 2 (2 m), 3 [3 m (9.8 ft)], 5 (5 m), or 10 (10 m) for standard cable lengths.
- (3) Replace z with 4 or 8 for number of ports.

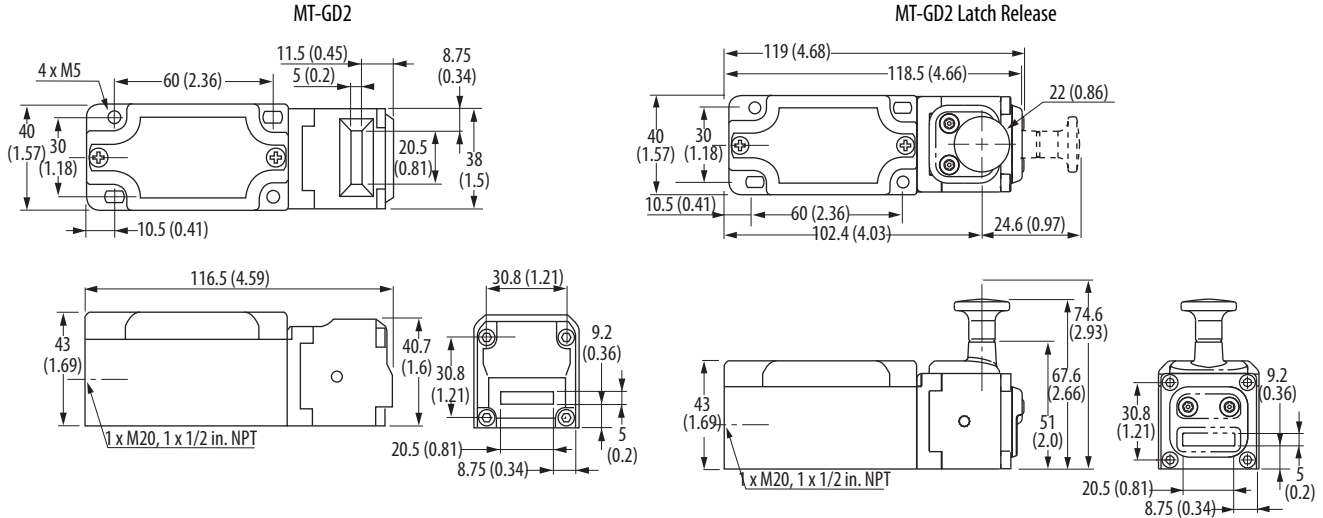
Accessories

Description	Cat. No.
 GD2 standard actuator	440G-A27011
 GD2 flat actuator	440K-A11112
 Fully flexible actuator	440G-A27143

Description	Cat. No.
 Sliding bolt actuator	440G-A27163
 Extended flat actuator	440K-A17116
 Dust Cover	440K-A17180

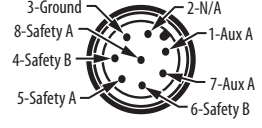
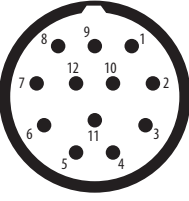
Approximate Dimensions

Dimensions are shown in mm (in.). Dimensions are not intended to be used for installation purposes. 2D, 3D, and electrical drawings are available on <https://ab.rockwellautomation.com/>.



Typical Wiring Diagrams

Description	2 N.C. & 1 N.O.	2 N.C. & 2 N.O.	3 N.C. & 1 N.O.
Contact Configuration			
Contact Action □ Open ■ Closed	<p>BBM</p>	<p>BBM</p>	<p>BBM</p>
	—	<p>MBB</p>	<p>MBB</p>
	—	<p>Snap Acting</p>	—
5-pin Micro (M12) for ArmorBlock Guard I/O	—		—

Description		2 N.C. & 1 N.O.	2 N.C. & 2 N.O.	3 N.C. & 1 N.O.
8-pin Micro (M12)		—		—
12-pin Cordset  Pins 2, 5 and 11 are not connected.	1 and 3	Safety A	Safety A	Safety A
	4 and 6	Safety B	Safety B	Safety B
	7 and 8	NC	Aux A	Safety C
	9 and 10	Aux A	Aux B	Aux A
	12	Ground	Ground	Ground
8-pin Cordset 889D-F8AB-x ⁽¹⁾	Grey Red	—	Safety A	—
	Yellow Pink	—	Safety B	—
	White Blue	—	Aux A	—
	Green	—	Ground	—
	Brown	—	Not Used	—
12-pin Cordset 889M-F12X9AE-x ⁽¹⁾	Brown Blue	Safety A	Safety A	Safety A
	White Green	Safety B	Safety B	Safety B
	Yellow Grey	Not Used	Aux A	Safety C
	Pink Red	Aux A	Aux B	Aux A
	Green/Yellow	Ground	Ground	Ground

(1) Replace x with 2 [2 m (6.56 ft)], 5 [5 m (16.4 ft)], or 10 [10 m (32.8 ft)] for standard cable lengths.

Trapped Key Interlock Switches

Bulletin Number 440T

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Trapped key interlock switches can be configured to provide that a predetermined sequence of events takes place or that hazards have been reduced before operators can become exposed to them.

Trapped key interlock switches have the following features:

- Stainless steel construction.
- 90° key operation.
- Compact, solid and sturdy keys supplied with dust seals and coded tagging.

Design Suggestions for an Interlocking System

Figure 1 - Plant and Machinery Interlocking

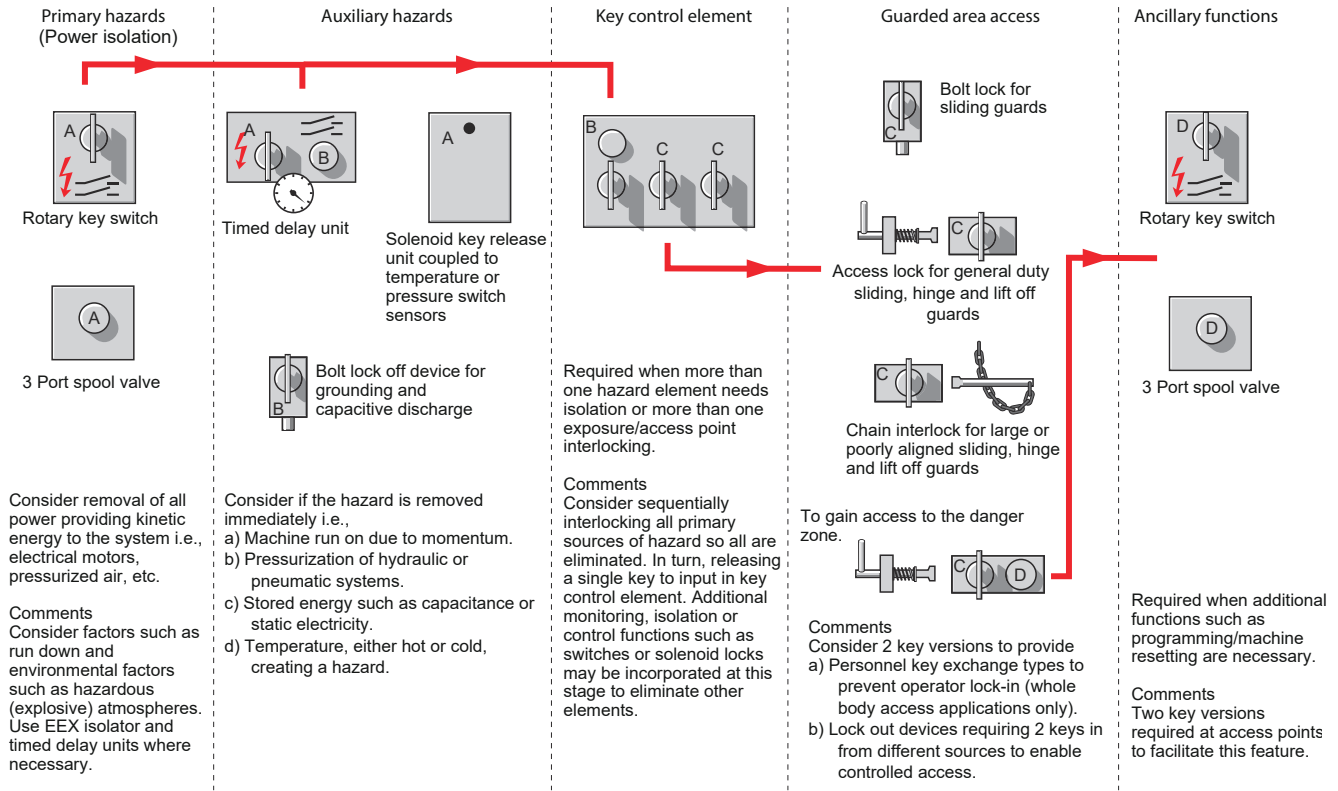
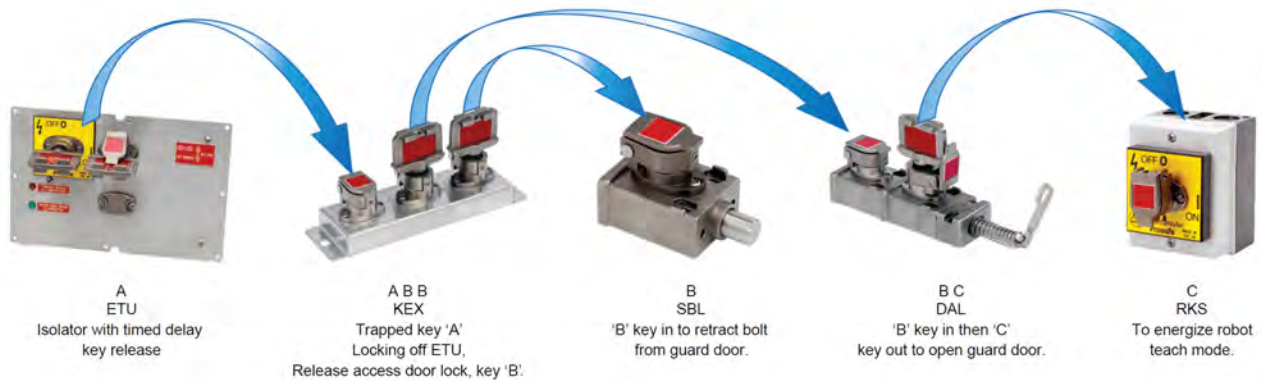


Figure 2 - Illustrated Principals of Trapped Key Interlocking



1. The Electronic Timed-delay Unit (ETU) isolator has two keys. One is a nonremovable key. The other key (a 'A' coded key) can be removed after a timed duration, which is set by a potentiometer inside the ETU isolator. Turn the nonremovable key to turn off the hazardous machine motion and start the timer. When the time expires, the Key Free light-emitting diode turns ON. Remove the 'A' key.
2. Insert the 'A' key into the Key Exchange Unit (KEX) and turn it 90°.
3. Turn one of the 'B' keys 90° and remove it from the KEX. This action traps the 'A' key in the KEX and helps help prevent the restarting of the machine.
4. Insert the 'B' key into the Single-key Bolt Lock (SBL) and turn it 90° to gain partial body access to the machine.

5. Turn the second 'B' key 90° and remove it from the KEX. Removal of this key also traps the 'A' key in the KEX and helps prevent the restarting of the machine.
6. Insert the 'B' key into the Dual-key Access Lock (DAL) and turn it 90°.
7. Turn the 'C' key 90° and remove 'C' key. To allow full body entry into the hazardous zone, rotate the access handle.
8. Take the 'C' key into the hazardous zone, insert it into the rotary keyswitch (RKSE), and turn it 90° to send a signal to the machine control system that allows the machine to operate in a slow or teach mode.
9. To return the machine to full operational mode, reverse the process.

Table 1 - Bill of Materials

Item	Quantity	Description	Cat. No.
1	1	Single Key Time Delayed with an A Primary Key	440T-MSTUE110A
2	1	Exchange Unit, B Primary Key, Two B Secondary Keys Trapped (included)	440T-MKXE110A0B0B
3	1	Single Bolt Lock, B Primary Key	440T-MSBLE100B
4	1	Dual Access Lock, B Primary Key, C Secondary Key Trapped (included)	440T-MDALE100B0C
5	1	Rotary Keyswitch, C Primary Code Barrel	440T-MRKSE100C
6	1	A Key	440T-AKEYE100A

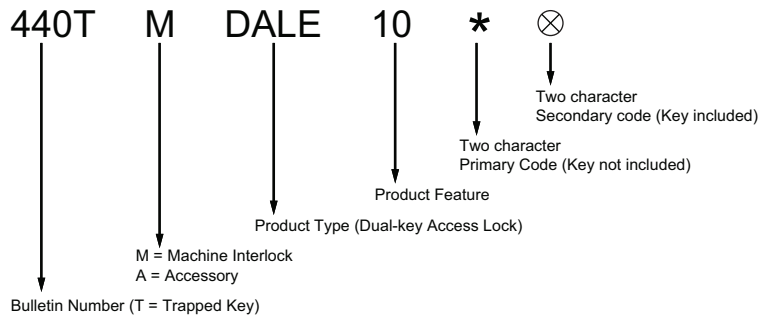
Primary keys must be ordered separately, when not provided for by a previous sequential trapped key. In the previous example, only one primary key must be ordered separately. The remaining primary keys are provided by a previous sequential secondary (trapped) key.

Code Selection

Ordering Prosafe® trapped key products requires codes to be included in the catalog number.

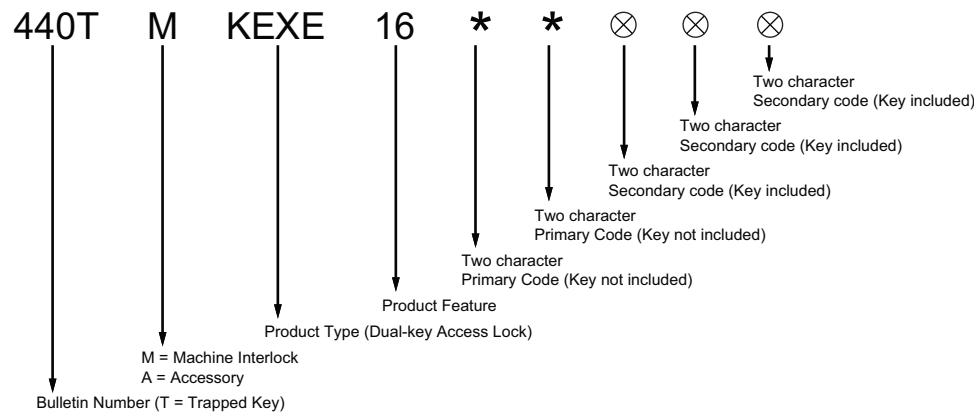
- The codes are added to the end of the catalog number.
- Each code must be two or three characters in length.
- The first code is the primary code and the last codes, if necessary, are the secondary codes.
- Primary codes are not included. The key must be ordered separately or must come from a previous operation.
- Secondary codes come with the product, as the key is trapped in the code barrel.
- Use [Table 2](#) on [page 111](#) to select and track codes.

Figure 3 - Ordering Example 1



Order catalog number 440T-MDALE10AAAB to get a Dual key Access Lock with an 'AA' primary code and an 'AB' secondary code, with an 'AB' key included.

Figure 4 - Ordering Example 2



Order catalog number 440T-MKEXE16AAABACACAC to get a key exchange unit with 'AA' and 'AB' primary codes and three 'AC' secondary codes. The 'AA' and 'AB' keys are not included. The three 'AC' keys, which are trapped in the secondary code barrels, are included.

Key Coding

Key codes are available in single, double, and triple letters. Available key codes are A through z, Aa through Zz, Aaa through Eac (1st letter A-E; 2nd letter a-f; 3rd letter a-z). Note that there are only 25 letters used - Q is not used.

Examples of key codes in catalog string:
 440T-MRPSE110A = key code "A"
 440T-MRPSE11AA = key code "Aa"
 440T-MRPSE113AAA = key code "Aaa"

	Code	Application & Date	Code	Application & Date	Code	Appli & Da
Start Down		granulator machine #472 24/3/01 me 67	Aa		Ab	
			Ba		Bb	
			Ca		Cb	
			Da		Db	

Below is an example reference guide that is useful to select and track codes. Single letter codes are ordered with upper case letters. Labels with two or three letter codes have the first letter upper case and the remaining letters lower case.

Table 2 - Code Selection and Tracking

Code	Application Date	Code	Application Date	Code	Application Date	Code	Application Date	Code	Application Date	Code	Application Date
Aa		Ab		Ac		Ad		Ae		Af	
Ba		Bb		Bc		Bd		Be		Bf	
Ca		Cb		Cc		Cd		Ce		Cf	
Da		Db		Dc		Dd		De		Df	
Ea		Eb		Ec		Ed		Ee		Ef	
Fa		Fb		Fc		Fd		Fe		Ff	
Ga		Gb		Gc		Gd		Ge		Gf	
Ha		Hb		Hc		Hd		He		Hf	
Ia		Ib		Ic		Id		Ie		If	
Ja		Jb		Jc		Jd		Je		Jf	
Ka		Kb		Kc		Kd		Ke		Kf	
La		Lb		Lc		Ld		Le		Lf	
Ma		Mb		Mc		Md		Me		Mf	
Na		Nb		Nc		Nd		Ne		Nf	
Oa		Ob		Oc		Od		Oe		Of	
Pa		Pb		Pc		Pd		Pe		Pf	
Qa		Qb		Qc		Qd		Qe		Qf	
Ra		Rb		Rc		Rd		Re		Rf	
Sa		Sb		Sc		Sd		Se		Sf	
Ta		Tb		Tc		Td		Te		Tf	
Ua		Ub		Uc		Ud		Ue		Uf	
Va		Vb		Vc		Vd		Ve		Vf	
Wa		Wb		Wc		Wd		We		Wf	
Xa		Xb		Xc		Xd		Xe		Xf	
Ya		Yb		Yc		Yd		Ye		Yf	
Za		Zb		Zc		Zd		Ze		Zf	

Rotary Trapped Key Interlock Switches

The rotary trapped key interlock switches have the following features:

- 316L stainless steel keys
- Direct drive operation—positively opens contacts
- Stainless steel dust cap included
- Up to 100 A isolation
- 4 N.O., 2 N.O. and 2 N.C., 3 N.O./1 N.C., 3 N.O., or 3 N.C. and neutral contacts
- Replaceable code barrel assembly



Specifications

Attribute		Value			
Standards		IEC60204-1, IEC60947-5-1, ISO14119, ISO13849-1, GS-ET-31			
Safety Classification		PLd, cat. 3 per ISO 13849-1			
Certifications		CE marked for all applicable directives, TÜV certified, c-UL-us on contact block; C-Tick not required www.rockwellautomation.com/certification/overview.page			
Conduit Entry		4 x M20 (RKS only)			
Operating Temperature		-10...+40 °C (14...104 °F)			
Mechanical Life		200,000 operations			
Shear Force to Key		15.1 kN (3398 lb), maximum			
Torque to Key		14 N•m (124 lb•in), maximum			
Relative Humidity		95%			
Finger Protection		DIN 57106/VDE 0106 T.100			
Weight—g (lbs)	RPSE	10, 11, 12, 13, 20:	500 (1.1)	14, 16:	1000 (2.2)
	RPSE	10, 11, 12, 13:	850 (1.9)	14, 16:	1250 (2.8)
Climatic Test		Constant to DIN IEC 68 Part 2-3 Variable to DIN IEC 68 Part 2-30			
Ambient Temperature, Operation		Encased 10°...104 °C (-25°...40 °F)			
(Ui) Rated Insulation Voltage		690V			
(Uimp) Rated Impulse withstand Voltage		6 kV			
S3 Intermittent Rating Duty Factor (VDE 0530, Part 1)		60/40/25% = 1, 3/1, 6/2 xlu			
Last two digits of Cat. No. (See Product Selection on page 113.)		10, 11, 16	12	13	14
Rated Uninterrupted Current (Iu)	IEC/EN/VDE	20 A	32 A	63 A	100 A
	UL/CSA	16 A	30 A	60 A	100 A
Rated Operational Voltage (Ue)	EC/EN/VDE	690V	690V	690V	1000V
	UL/CSA	600V	600V	600V	600V
	Main Switch Isolation Voltage, Maximum	750V	750V	750V	1000V
Rated Operational Current (Ie)	AC-21A IEC/EN/VDE	20 A	32 A	63 A	100 A
	AC-1 SEV	20 A	32 A	63 A	100 A
Rated Operational Power at 50/60 Hz (AC-23A IEC/EN/VDE)	3-phase 220...240V	4 kW	7.5 kW	15 kW	22 kW
	3-pole 380...440V	7.5 kW	15 kW	30 kW	37 kW
	500...690V	7.5 kW	15 kW	30 kW	37 kW
Rated Operational Power at 50/60 Hz (AC-3A IEC/EN/VDE)	3-phase 220...240V	4 kW	7.5 kW	15 kW	22 kW
	3-pole 380...440V	5.5 kW	11 kW	22 kW	37 kW
	500...690V	5.5 kW	11 kW	22 kW	37 kW
DOL Rating (UL/CSA)	3-phase 140V	1.5 HP	3 HP	5 HP	7.5 HP
	3-pole 240V	3 HP	10 HP	15 HP	30 HP
	480V	7.5 HP	20 HP	30 HP	50 HP
	600V	10 HP	20 HP	40 HP	50 HP

Attribute	Value				
Rated Breaking Capacity	AC-23/AC-3 220...240V	250 A	330 A	500 A	600 A
	Motor Switch 80...440V	250 A	330 A	500 A	600 A
	500...690V	150 A	220 A	270 A	600 A
Fuse Rating (GI)	330 A	500 A	600 A		
Rated Fuse Short Circuit Current		25 A, maximum	35 A, maximum	63/50 A, maximum	100 A, maximum
Terminal Cross Section		1...10		4...16	2.5...3.5
		mm ² single/multiple wire			
Conductor Size, mm ² min...max		0.75...6		2.5...10	1.5...2.5
		(stranded) with sleeve			
		8 AWG		6 AWG	2 AWG

Product Selection

Table 3 - Enclosure Mounted IP65 (RKS only)

Contact Type	Current Accuracy	Cat. No.
4 N.O.	20 A	440T-MRKSE10x ⁽¹⁾
2 N.O. and 2 N.C.	20 A	440T-MRKSE11x ⁽¹⁾
4 N.O.	32 A	440T-MRKSE12x ⁽¹⁾
4 N.O.	63 A	440T-MRKSE13x ⁽¹⁾
3 N.O. and 1 N.O.	3 N.O. 100 A and 1 N.O. 20 A	440T-MRKSE14x ⁽¹⁾
8 N.O.	20 A	440T-MRKSE16x ⁽¹⁾

(1) Substitute the desired primary code for x (key not included). See [Key Coding](#) on page 111 for code selection.



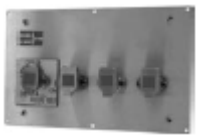

Table 4 - Panel Mounted

Contact Type	Current Accuracy	Cat. No.
4 N.O.	20 A	440T-MRPSE10x ⁽¹⁾
2 N.O. and 2 N.C.	20 A	440T-MRPSE11x ⁽¹⁾
4 N.O.	32 A	440T-MRPSE12x ⁽¹⁾
4 N.O.	63 A	440T-MRPSE13x ⁽¹⁾
3 N.O. and 1 N.O.	3 N.O. 100 A and 1 N.O. 20 A	440T-MRPSE14x ⁽¹⁾
8 N.O.	20 A	440T-MRPSE16x ⁽¹⁾
4 N.O.	40 A	440T-MRPSE20x ⁽¹⁾

(1) Substitute the desired primary code for x (key not included). See [Key Coding](#) on page 111 for code selection.



Table 5 - Multi-key Rotary Switches

	Type	Number of Keys	Contact Type	Current Accuracy	Cat. No.
Isolator on First Key Out					
	Dual key isolator	2 keys out	4 N.O.	20 A	440T-MMRSE10xx ⁽¹⁾
			2 N.O. & 2 N.C.	20 A	440T-MMRSE11xx ⁽¹⁾
			4 N.O.	32 A	440T-MMRSE12xx ⁽¹⁾
			4 N.O.	63 A	440T-MMRSE13xx ⁽¹⁾
	Triple key isolator	3 keys out	4 N.O.	20 A	440T-MMRSE20xxx ⁽¹⁾
			2 N.O. & 2 N.C.	20 A	440T-MMRSE21xxx ⁽¹⁾
			4 N.O.	32 A	440T-MMRSE22xxx ⁽¹⁾
			4 N.O.	63 A	440T-MMRSE23xxx ⁽¹⁾
	Quad key isolator	4 keys out	4 N.O.	20 A	440T-MMRSE30xxxx ⁽¹⁾
			2 N.O. & 2 N.C.	20 A	440T-MMRSE31xxxx ⁽¹⁾
			4 N.O.	32 A	440T-MMRSE32xxxx ⁽¹⁾
			4 N.O.	63 A	440T-MMRSE33xxxx ⁽¹⁾
	Dual key exchange isolator	1 key in/ 1 key out	4 N.O.	20 A	440T-MMRXE10xy ⁽¹⁾⁽²⁾
			2 N.O. & 2 N.C.	20 A	440T-MMRXE11xy ⁽¹⁾⁽²⁾
			4 N.O.	32 A	440T-MMRXE12xy ⁽¹⁾⁽²⁾
			4 N.O.	63 A	440T-MMRXE13xy ⁽¹⁾⁽²⁾
	Triple key exchange isolator	1 key in/ 2 keys out	4 N.O.	20 A	440T-MMRXE20xyy ⁽¹⁾⁽²⁾
			2 N.O. & 2 N.C.	20 A	440T-MMRXE21xyy ⁽¹⁾⁽²⁾
			4 N.O.	32 A	440T-MMRXE22xyy ⁽¹⁾⁽²⁾
			4 N.O.	63 A	440T-MMRXE23xyy ⁽¹⁾⁽²⁾
	Quad key exchange isolator	1 key in/ 3 keys out	4 N.O.	20 A	440T-MMRXE30xyyy ⁽¹⁾⁽²⁾
			2 N.O. & 2 N.C.	20 A	440T-MMRXE31xyyy ⁽¹⁾⁽²⁾
			4 N.O.	32 A	440T-MMRXE32xyyy ⁽¹⁾⁽²⁾
			4 N.O.	63 A	440T-MMRXE33xyyy ⁽¹⁾⁽²⁾

(1) Substitute the desired primary code for x (key not included). See [Key Coding](#) on page 111 for code selection.

(2) Substitute the desired secondary code for y (key not included). See [Key Coding](#) on page 111 for code selection.

Accessories

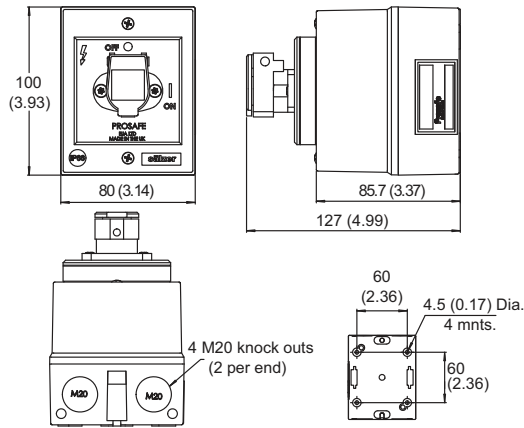
Description	Additional Information	Cat. No.
Stainless Steel Key	See Accessories on page 145 .	440T-AKEYE10x ⁽¹⁾
Stainless Steel Replacement Code Barrel for Products Other than 100 A RPS/RKS Units		440T-ASCBE14x ⁽¹⁾
Stainless Steel Replacement Code Barrel for 100 A Unit Rotary Switch		440T-ASCBE11x ⁽¹⁾
Stainless Steel Weatherproof Replacement Dust Cap		440T-ASF10x ⁽¹⁾
Cable Grip, M20 Conduit, accommodates cable diameter 7...10.5 mm (0.27...0.41 in.)	—	440A-A09028
Adaptor, Conduit, M20 to 1/2 inch NPT, Plastic		440A-A09042
Supplemental Contact Block, 20 A, 1 N.O. Late Make, Early Break 1 N.C. Auxiliary	For use with RPSE12, RPSE20 (maximum 1 per switch)	440T-AACA10
Supplemental Contact Block, 20 A, 2 N.O. Late Make, Early Break	For use with RPSE12, RPSE20 (maximum 1 per switch)	440T-AACA11
Supplemental Contact Block, 20 A, 1 N.O., 1 N.C.	For use with RPSE13 and 14	440T-AACA20
Supplemental Contact Block, 20 A, 2 N.O.	For use with RPSE13 and 14	440T-AACA21

(1) Substitute the desired primary code for x (key not included). See [Key Coding](#) on page [111](#) for code selection.

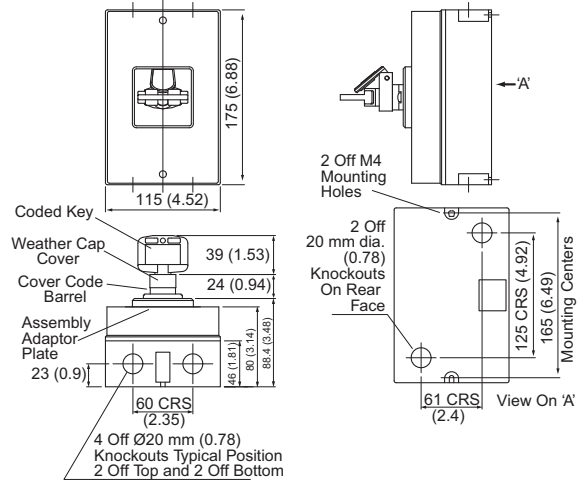
Approximate Dimensions

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

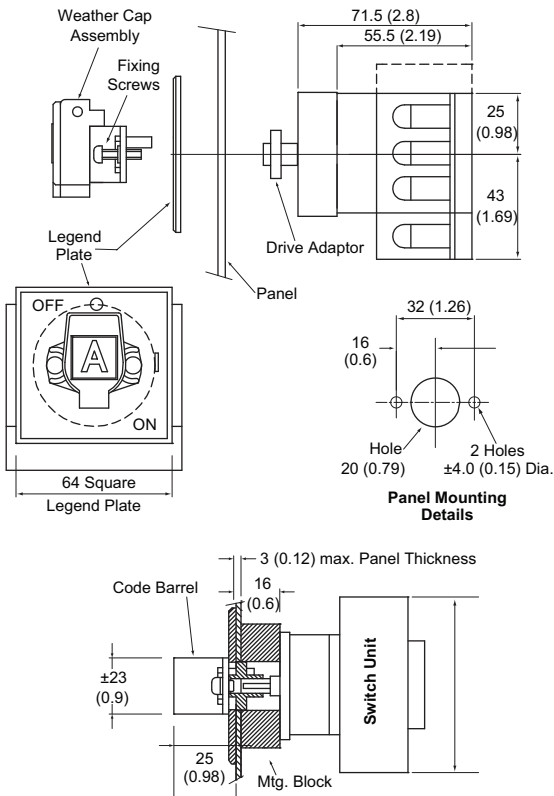
RKSE10 and RKSE11



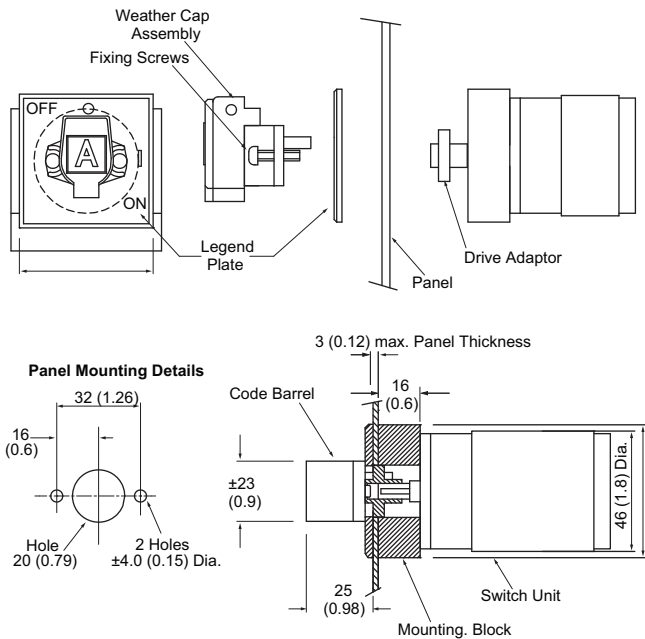
RKSE12 and RKSE13



RPSE 12, 13, 14 and 20

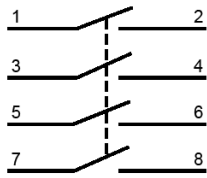


RPSE16

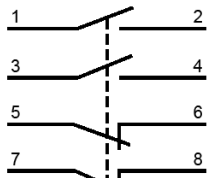


Typical Wiring Diagrams

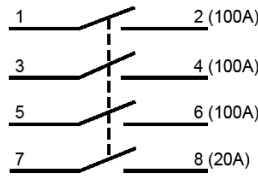
Figure 5 - Diagrams Shown with Key Free



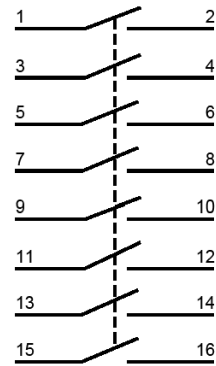
RKSE10 and RPSE10
 RKSE12 and RPSE12
 RKSE13 and RPSE13
 RPSE20



RKSE11 and RPSE11



RKSE14 and RPSE14



RPSE16

Trapped Key Solenoid Release Units

The trapped key solenoid release units have the following features:

- Direct drive operation—positively opens contacts
- Integral solenoid monitoring
- Key trapped until release signal is applied
- Green LED ‘key free’ indication
- 316L stainless steel construction
- 24V DC, 110V AC or 230V AC solenoid options
- Weatherproof stainless steel dust cap as standard
- UL and CSA approval on switches
- Single or multiple key units available (contact factory)
- Replaceable code barrel assembly



Specifications

Attribute	Value
Standards	IEC60204-1, IEC60947-5-1, ISO13849-1, ISO14119, GS-ET-31
Safety Classification	PLd, cat. 3 per ISO 13849-1
Certifications	CE marked for all applicable directives, TÜV certified, and c-UL-us www.rockwellautomation.com/certification/overview.page
Solenoid Voltage	24V DC, 110V AC, 230V AC
Solenoid Power	DC Types: 6.5 W continuous AC Types: 6V A continuous
Electrical Characteristics	See Specifications on page 112.
Mounting	Any position
Shear Force to Key	15.1 kN (3398 lb), max.
Torque to Key	14 N·m (124 lb-in), max.
Cable Type	0.75 mm ² (18 AWG) 2-wire PVC jacket QD
Operating Temperature	0...40° C (32...104° F)
Relative Humidity	95%
Material	Trapped key components: 316L stainless steel
	Faceplate: 316L stainless steel
	Optional box: ABS plastic or stainless steel
Mechanical Life	200,000 operations

Product Selection

Type	Solenoid Voltage	Contacts	Current, Nom	Cat. No.	
Single Key Out	24V DC	2 N.O. and 2 N.C.	20 A	440T-MSRUE11x ⁽¹⁾	
		4 N.O.		440T-MSRUE10x ⁽¹⁾	
			32 A	440T-MSRUE12x ⁽¹⁾	
	110V AC	2 N.O. and 2 N.C.	4 N.O.	20 A	440T-MSRUE22x ⁽¹⁾
					440T-MSRUE20x ⁽¹⁾
				32 A	440T-MSRUE23x ⁽¹⁾
	230V AC	2 N.O. and 2 N.C.	4 N.O.	20 A	440T-MSRUE33x ⁽¹⁾
					440T-MSRUE30x ⁽¹⁾
				32 A	440T-MSRUE34x ⁽¹⁾
	110V DC	2 N.O. and 2 N.C.	4 N.O.	20 A	440T-MSRUE44x ⁽¹⁾
					440T-MSRUE40x ⁽¹⁾
			3 N.O. and 3 N.C.		440T-MSRUE46x ⁽¹⁾
Dual Key Out	24V DC	4 N.O.	20 A	440T-MS2097Dxx ⁽¹⁾	
		2 N.O. and 2 N.C.		440T-MS2097Axx ⁽¹⁾	
		4 N.O.	32 A	440T-MS2097Gxx ⁽¹⁾	
			63 A	440T-MS2097Jxx ⁽¹⁾	
Triple Key Out		24V DC	4 N.O.	20 A	440T-MS3417Dxxx ⁽¹⁾
			2 N.O. and 2 N.C.		440T-MS3417Axxx ⁽¹⁾
			4 N.O.	32 A	440T-MS3417Gxxx ⁽¹⁾
				63 A	440T-MS3417Jxxx ⁽¹⁾
Quad Key Out	24V DC		4 N.O.	20 A	440T-MS3418Dxxxx ⁽¹⁾
			2 N.O. and 2 N.C.		440T-MS3418Axxxx ⁽¹⁾
			4 N.O.	32 A	440T-MS3418Gxxxx ⁽¹⁾
				63 A	440T-MS3418Jxxxx ⁽¹⁾

(1) Substitute the desired primary code for x (key not included). See [Key Coding](#) on page 111 for code selection.

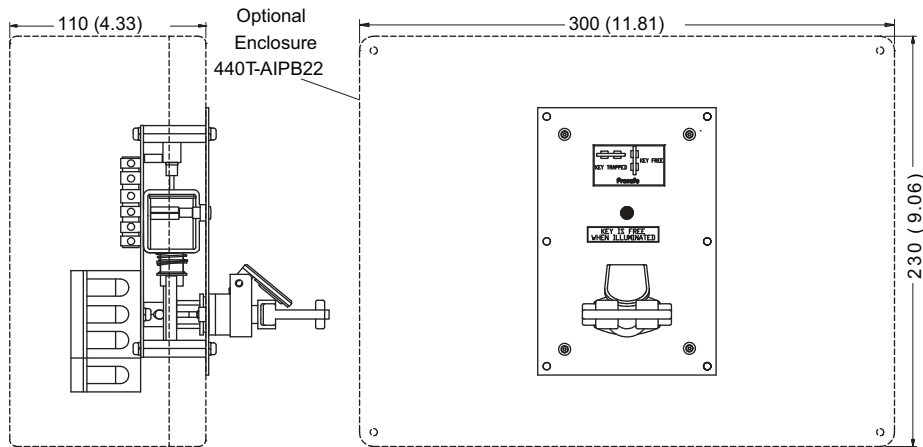
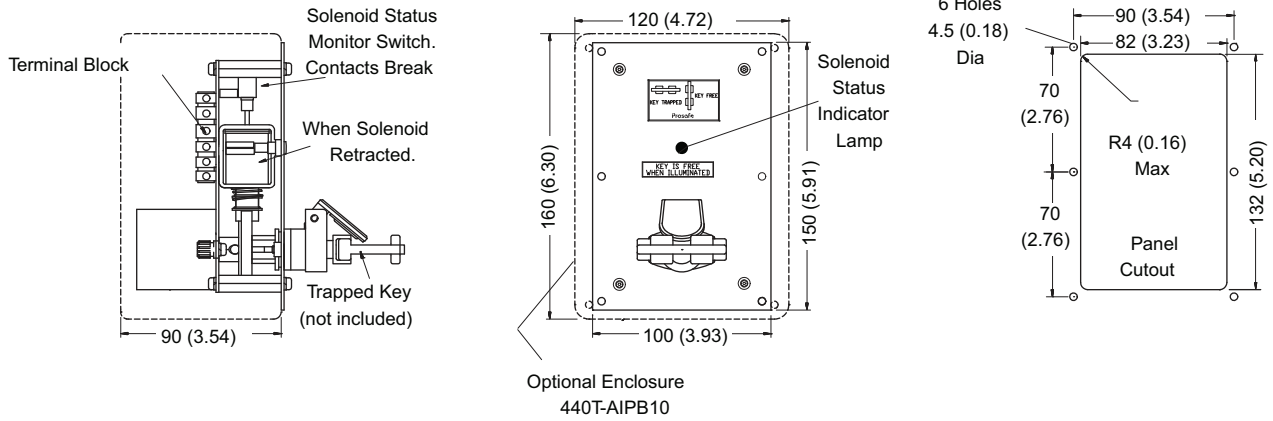
Accessories

Description	Additional Information	Cat. No.
Stainless Steel Key	See Accessories on page 145.	440T-AKEYE10x ⁽¹⁾
Stainless Steel Replacement Code Barrel for Products Other than 100 A RPS/RKS Units		440T-ASCBE14x ⁽¹⁾
Stainless Steel Weatherproof Replacement Dust Cap		440T-ASFC10x ⁽¹⁾
Optional IP65 Plastic Enclosure	For use with 20 A units	440T-AIPB10
Optional IP65 Plastic Enclosure	For use with 32 A units	440T-AIPB22

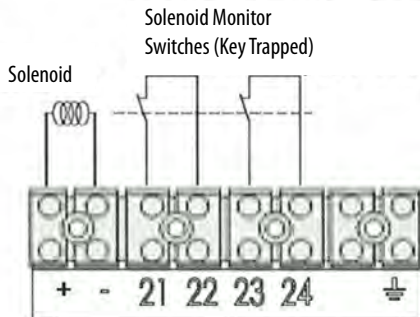
(1) Substitute the desired primary code for x (key not included). See [Key Coding](#) on page 111 for code selection.

Approximate Dimensions

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



Typical Wiring Diagram



Trapped Key Switch with Electronic Timed-delay Units

The trapped key switch with electronic timed-delay units have the following features:

- Timed-delay output up to 30 minutes
- Single key or dual key
- 316L stainless steel keys
- Category 1 Stop
- Replaceable code barrel assembly



Specifications

Attribute	Value
Standards	IEC60204-1, IEC60947-5-1
Certifications	CE marked for all applicable directives www.rockwellautomation.com/certification/overview.page
Solenoid Voltage	24V DC, 110V AC, 230V AC
Shear Force to Key	15.1 kN (3398 lbs), max.
Torque to Key	14 N·m (124 lb·in), max.
Operating Temperature	0...40° C (32...104° F)
Relative Humidity	95%
Material	Trapped key components: 316L stainless steel Faceplate: 316L stainless steel
Mounting	Tamper resistant screws
Mechanical Life	200,000 operations
Time Delay	0.1 second...30 minutes

Product Selection

Type	Solenoid Voltage	Contact Set 1	Contact Set 2	Cat. No.
Single Key Out Panel Mounted	24V DC	3 N.O. 40 A	1 N.O. 20 A	440T-MSTUE10x ⁽¹⁾
		2 N.O. 20 A	1 N.O. 20 A	440T-MSTUE11x ⁽¹⁾
	110V AC	3 N.O. 40 A	1 N.O. 20 A	440T-MSTUE20x ⁽¹⁾
		2 N.O. 20 A	1 N.O. 20 A	440T-MSTUE22x ⁽¹⁾
	230V AC	3 N.O. 40 A	1 N.O. 20 A	440T-MDTUE30x ⁽¹⁾
		2 N.O. 20 A	1 N.O. 20 A	440T-MSTUE33x ⁽¹⁾
Dual Key Out Panel Mounted	24V DC	3 N.O. 40 A	1 N.O. 20 A	440T-MDTUE10xx ⁽¹⁾
		2 N.O. 20 A	1 N.O. 20 A	440T-MDTUE11xx ⁽¹⁾
	110V AC	3 N.O. 40 A	1 N.O. 20 A	440T-MDTUE20xx ⁽¹⁾
		2 N.O. 20 A	1 N.O. 20 A	440T-MDTUE22xx ⁽¹⁾
	230V AC	3 N.O. 40 A	1 N.O. 20 A	440T-MDTUE30xx ⁽¹⁾
		2 N.O. 20 A	1 N.O. 20 A	440T-MDTUE33xx ⁽¹⁾

(1) Substitute the desired primary code for x(key not included). See [Key Coding](#) on page 111 for code selection.

Accessories

Description	Additional Information	Cat. No.
Stainless Steel Key	See Accessories on page 145 .	440T-AKEYE10x ⁽¹⁾
Stainless Steel Replacement Code Barrel for Products Other than 100 A RPS/RKS Units		440T-ASCBE14x ⁽¹⁾
Stainless Steel Weatherproof Replacement Dust Cap		440T-ASF10x ⁽¹⁾

(1) Substitute the desired primary code for x (key not included). See [Key Coding](#) on page [111](#) for code selection.

Trapped Key Stopped Motion Units

The trapped key stopped motion units have the following features:

- Stopped motion detection
- NPN and PNP proximity sensors
- Timed-delay output up to 40 minutes
- Category 1 Stop
- Replaceable code barrel assembly



Specifications

Attribute	Value
Standards	IEC60204-1, IEC60947-5-1
Certifications	CE marked for all applicable directives www.rockwellautomation.com/certification/overview.page
Operating Temperature	0...40 °C (32...104 °F)
Relative Humidity	95%
Electrical Life	100,000 operations
Mechanical Life	100,000 operations
Shear Force to Key	15.1 kN (3398 lb)
Torque to Key	14 N·m (124 lb-in)
Material	Trapped key components: 316L stainless steel Faceplate: 316L stainless steel Inductive sensors: stainless steel barrel, plastic face
Mounting	Tamper resistant screws
Weight	2.0 kg (4.4 lb)
Solenoid Voltage	24V DC, 110V AC and 230V AC
Time Delay	0.1 second...40 minutes
Zero Speed Sensors	2x inductive sensors

Product Selection

Type	Solenoid Voltage	Contact Set 1	Contact Set 2	Cat. No.
Single Key Out Panel Mounted	24V DC	3 N.O. 40 A	1 N.O. 20 A	440T-MSTUE10x ⁽¹⁾
		2 N.O. 20 A	1 N.O. 20 A	440T-MSTUE11x ⁽¹⁾
	110V AC	3 N.O. 40 A	1 N.O. 20 A	440T-MSTUE20x ⁽¹⁾
		2 N.O. 20 A	1 N.O. 20 A	440T-MSTUE22x ⁽¹⁾
	230V AC	3 N.O. 40 A	1 N.O. 20 A	440T-MDTUE30x ⁽¹⁾
		2 N.O. 20 A	1 N.O. 20 A	440T-MSTUE33x ⁽¹⁾
Dual Key Out Panel Mounted	24V DC	3 N.O. 40 A	1 N.O. 20 A	440T-MDTUE10xx ⁽¹⁾
		2 N.O. 20 A	1 N.O. 20 A	440T-MDTUE11xx ⁽¹⁾
	110V AC	3 N.O. 40 A	1 N.O. 20 A	440T-MDTUE20xx ⁽¹⁾
		2 N.O. 20 A	1 N.O. 20 A	440T-MDTUE22xx ⁽¹⁾
	230V AC	3 N.O. 40 A	1 N.O. 20 A	440T-MDTUE30xx ⁽¹⁾
		2 N.O. 20 A	1 N.O. 20 A	440T-MDTUE33xx ⁽¹⁾

(1) Substitute the desired primary code for x (key not included). See [Key Coding](#) on page 111 for code selection.

Accessories

Description	Size	Type	Additional Information	Cat. No.
Stainless Steel Key	—	—	See Accessories on page 145.	440T-AKEYE10x ⁽¹⁾
Stainless Steel Replacement Code Barrel for Products Other than 100 A RPS/RKS Units				440T-ASCBE14x ⁽¹⁾
Stainless Steel Weatherproof Replacement Dust Cap				440T-ASFC10x ⁽¹⁾
500 mA Fuse—Bussmann Cat. No. ETF-500mA		500 mA @ 250V	—	—
Optional Stainless Steel Enclosure		—	For use with all units	440T-AIPB46
Inductive Proximity Sensor, Three-wire, DC	12 mm (.47 in.)	NPN	—	872C-M4BN12-E2
		PNP		872C-D3NP12-E2
	18 mm (.71 in.)	NPN		872C-D5NN18-E2
		PNP		872C-D5NP18-E2
	30 mm (1.18 in.)	NPN		872C-M15BN30-E2
		PNP		872C-M15BNP30-E2

(1) Substitute the desired primary code for x (key not included). See [Key Coding](#) on page 111 for code selection.

Trapped Key Interlock Exchange Unit Switches

The trapped key interlock exchange unit switches have the following features:

- A range of off-the-shelf units in various combinations
- 316L stainless steel construction
- Primary keys in release secondary keys simultaneously on units up to six ways
- Weatherproof stainless steel dust cap as standard
- Replaceable code barrel assembly



Specifications

Standards	ISO14119, ISO13849-1, GS-ET-31
Safety Classification	PLd, cat. 3 per ISO13849-1
Certifications	CE marked for all applicable directives; C-Tick not required www.rockwellautomation.com/certification/overview.page
Operating Temperature	0...40 °C (32...104 °F)
Relative Humidity	95%
Mechanical Life	200,000 operations
Shear Force to Key	15.1 kN (3398 lb)
Torque to Key	14 N·m (124 lb·in)
Material	316L stainless steel

Optional Key Exchange Cabinets

Type	Number of Keys	Length—mm (in)	Width—mm (in)	Depth—mm (in)	Cat. No.
Painted Mild Steel	7...11 way (max)	400 (15.7)	300 (11.8)	200 (7.87)	440T-AIPB30
	12...15 way (max)	400 (15.7)	400 (15.7)	210 (8.26)	440T-AIPB33
	16...25 way (max)	600 (23.6)	600 (23.6)	210 (8.26)	440T-AIPB34
Stainless Steel	12...15 way (max)	400 (15.7)	400 (15.7)	210 (8.26)	440T-AIPB40
	16...25 way (max)	600 (23.6)	600 (23.6)	210 (8.26)	440T-AIPB44

Product Selection

Number of Keys	Keys In and Out	Cat. No.
2 way	1 key in 1 key out	440T-MKEXE10 ⁽¹⁾
3 way	1 key in 2 key out	440T-MKEXE11 ⁽¹⁾
4 way	1 key in 3 key out	440T-MKEXE12 ⁽¹⁾
5 way	1 key in 4 key out	440T-MKEXE13 ⁽¹⁾
6 way	1 key in 5 key out	440T-MKEXE14 ⁽¹⁾
4 way	2 key in 2 key out	440T-MKEXE15 ⁽¹⁾
5 way	2 key in 3 key out	440T-MKEXE16 ⁽¹⁾
6 way	2 key in 4 key out	440T-MKEXE17 ⁽¹⁾
6 way	3 key in 3 key out	440T-MKEXE18 ⁽¹⁾
7 way	1 key in 6 key out	440T-MKEXE19 ⁽¹⁾

Number of Keys	Keys In and Out	Cat. No.
8 way	1 key in 7 key out	440T-MKEXE20 ⁽¹⁾
9 way	1 key in 8 key out	440T-MKEXE22 ⁽¹⁾
10 way	1 key in 9 key out	440T-MKEXE23 ⁽¹⁾
11 way	1 key in 10 key out	440T-MKEXE24 ⁽¹⁾
12 way	1 key in 11 key out	440T-MKEXE25 ⁽¹⁾
13 way	1 key in 12 key out	440T-MKEXE26 ⁽¹⁾
14 way	1 key in 13 key out	440T-MKEXE27 ⁽¹⁾
15 way	1 key in 14 key out	440T-MKEXE28 ⁽¹⁾
16 way	1 key in 15key out	440T-MKEXE29 ⁽¹⁾
17 way	1 key in 16 key out	440T-MKEXE30 ⁽¹⁾
18 way	1 key in 17 key out	440T-MKEXE33 ⁽¹⁾
19 way	1 key in 18 key out	440T-MKEXE34 ⁽¹⁾
20 way	1 key in 19 key out	440T-MKEXE35 ⁽¹⁾
21 way	1 key in 20 key out	440T-MKEXE36 ⁽¹⁾
22 way	1 key in 21 key out	440T-MKEXE37 ⁽¹⁾
23 way	1 key in 22 key out	440T-MKEXE38 ⁽¹⁾
24 way	1 key in 23key out	440T-MKEXE39 ⁽¹⁾

(1) Specify the codes individually for each primary key in (key not included) and for each secondary key (key included). See [Key Coding](#) on page 111 for code selection.

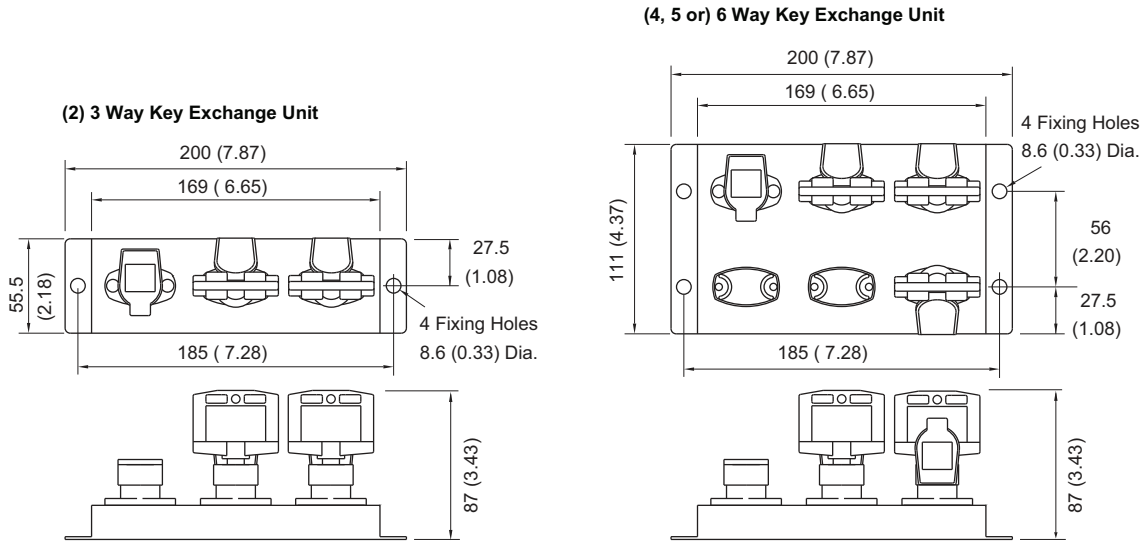
Accessories

Description	Additional Information	Cat. No.
Stainless Steel Key	See Accessories on page 145.	440T-AKEYE10x ⁽¹⁾
Stainless Steel Replacement Code Barrel for Products Other than 100 A RPS/RKS Units		440T-ASCBE14x ⁽¹⁾
Stainless Steel Weatherproof Replacement Dust Cap		440T-ASFC10x ⁽¹⁾

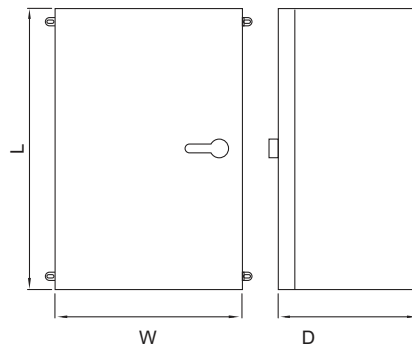
(1) Substitute the desired primary code for x (key not included). See [Key Coding](#) on page 111 for code selection.

Approximate Dimensions

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



Key Exchange Cabinets (painted mild steel or stainless steel)



Trapped Key Bolt Interlock Switches

The trapped key bolt interlock switches have the following features:

- 316L stainless steel construction
- Single or dual key units
- Various extensions of bolt
- Direct drive push/pull operation
- Replaceable code barrel assembly
- Fitted with tamper resistant screws
- Weatherproof stainless steel dust cap as standard



Specifications

Attribute		Value
Standards		IEC60204-1, IEC60947-5-1, ISO13849-1, ISO14119, GS-ET-131
Safety Classification		PLd, cat. 3 per ISO13849-1
Certifications		CE marked for all applicable directives; C-Tick not required; TÜV certified www.rockwellautomation.com/certification/overview.page
Operating Temperature		-40...+80 °C (-40...+176 °F)
Relative Humidity		95%
Mechanical Life		200,000 operations
Shear Force to Key		15.1 kN (3398 lb)
Torque to Key		14 N·m (124 lb·in)
Material		Faceplate: 316L stainless steel
Mounting	SBL	2 x M5 counterbored from top or
		2 x M5 from underside with M5 nuts
	DBL	4 x M5 counterbored from top or
		4 x M5 from underside with M5 nuts
Bolt Diameter		15 mm (0.59 in)

Product Selection—Mechanical

Type	Trapped Key Condition	Bolt Retracted— mm (in.)	Bolt Extended— mm (in.)	Cat. No.
Single Key	Key Trapped to Retract Bolt	0	14 (0.55)	440T-MSBLE10x ⁽¹⁾
		3 (0.11)	17 (0.66)	440T-MSBLE11x ⁽¹⁾
		6 (0.23)	20 (0.78)	440T-MSBLE12x ⁽¹⁾
		13 (0.51)	27 (1.06)	440T-MSBLE13x ⁽¹⁾
Dual Key	Dual Key with Secondary Ejector Key	0	14 (0.55)	440T-MDBLE10x ⁽¹⁾
		3 (0.11)	17 (0.66)	440T-MDBLE11x ⁽¹⁾
		6 (0.23)	20 (0.78)	440T-MDBLE12x ⁽¹⁾
		13 (0.51)	27 (1.06)	440T-MDBLE13x ⁽¹⁾
	Primary Key Trapped, Secondary—Key Free to Retract Bolt	0	14 (0.55)	440T-MDBLE14xy ⁽¹⁾⁽²⁾
		3 (0.11)	17 (0.66)	440T-MDBLE15xy ⁽¹⁾⁽²⁾
		6 (0.23)	20 (0.78)	440T-MDBLE16xy ⁽¹⁾⁽²⁾
		13 (0.51)	27 (1.06)	440T-MDBLE17xy ⁽¹⁾⁽²⁾
Dual Key with Secondary Ejector Key	Primary Key Trapped, Secondary—Key Free to Retract Bolt	0	14 (0.55)	440T-MDBLJ14xy ⁽¹⁾⁽²⁾
		3 (0.11)	17 (0.66)	440T-MDBLJ15xy ⁽¹⁾⁽²⁾
		6 (0.23)	20 (0.78)	440T-MDBLJ16xy ⁽¹⁾⁽²⁾
		13 (0.51)	20 (0.78)	440T-MDBLJ17xy ⁽¹⁾⁽²⁾
Triple Key	Three Keys Trapped to Retract Bolt	0	14 (0.55)	440T-MTBLE10xxx ⁽¹⁾
		3 (0.11)	17 (0.66)	440T-MTBLE11xxx ⁽¹⁾
		6 (0.23)	20 (0.78)	440T-MTBLE12xxx ⁽¹⁾
		13 (0.51)	27 (1.06)	440T-MTBLE13xxx ⁽¹⁾
	Two Primary Trapped, One Secondary Key Free to Retract Bolt	0	14 (0.55)	440T-MTBLE14xxy ⁽¹⁾⁽²⁾
		3 (0.11)	17 (0.66)	440T-MTBLE15xxy ⁽¹⁾⁽²⁾
		6 (0.23)	20 (0.78)	440T-MTBLE16xxy ⁽¹⁾⁽²⁾
		13 (0.51)	27 (1.06)	440T-MTBLE17xxy ⁽¹⁾⁽²⁾
	One Primary Trapped, Two Secondary Keys Free to Retract Bolt	0	14 (0.55)	440T-MTBLE18xyy ⁽¹⁾⁽²⁾
		3 (0.11)	17 (0.66)	440T-MTBLE19xyy ⁽¹⁾⁽²⁾
		6 (0.23)	20 (0.78)	440T-MTBLE20xyy ⁽¹⁾⁽²⁾
		13 (0.51)	27 (1.06)	440T-MTBLE21xyy ⁽¹⁾⁽²⁾
Quad Key	Four Keys Trapped to Retract Bolt	0	14 (0.55)	440T-MQBLE10xxxx ⁽¹⁾
		3 (0.11)	17 (0.66)	440T-MQBLE11xxxx ⁽¹⁾
		6 (0.23)	20 (0.78)	440T-MQBLE12xxxx ⁽¹⁾
		13 (0.51)	27 (1.06)	440T-MQBLE13xxxx ⁽¹⁾
	Three Primary Trapped, One Secondary Key Free to Retract Bolt	0	14 (0.55)	440T-MQBLE14xxxxy ⁽¹⁾⁽²⁾
		3 (0.11)	17 (0.66)	440T-MQBLE15xxxxy ⁽¹⁾⁽²⁾
		6 (0.23)	20 (0.78)	440T-MQBLE16xxxxy ⁽¹⁾⁽²⁾
		13 (0.51)	27 (1.06)	440T-MQBLE17xxxxy ⁽¹⁾⁽²⁾

(1) Substitute the desired primary code for x (key not included). See [Key Coding](#) on page 111 for code selection.

(2) Substitute the desired secondary code for y (key not included). See [Key Coding](#) on page 111 for code selection.

Product Selection—Electrical

Contact Type	Type	Trapped Key Condition	Bolt Retracted— mm (in.)	Bolt Extended— mm (in.)	Cat. No.
2 N.C. & 1 N.O. break before make	Single Key	Key Trapped to Retract Bolt	0	14 (0.55)	440T-MSBSE10x ⁽¹⁾
			3 (0.11)	17 (0.66)	440T-MSBSE11x ⁽¹⁾
			6 (0.23)	20 (0.78)	440T-MSBSE12x ⁽¹⁾
			13 (0.51)	27 (1.06)	440T-MSBSE13x ⁽¹⁾
		Key Free to Retract Bolt	0	14 (0.55)	440T-MSBSE33x ⁽¹⁾
			3 (0.11)	17 (0.66)	440T-MSBSE34x ⁽¹⁾
			6 (0.23)	20 (0.78)	440T-MSBSE35x ⁽¹⁾
			13 (0.51)	27 (1.06)	440T-MSBSE36x ⁽¹⁾
	Dual Key	Both Keys Trapped to Retract Bolt	0	14 (0.55)	440T-MDBSE10xx ⁽¹⁾
			3 (0.11)	17 (0.66)	440T-MDBSE11xx ⁽¹⁾
			6 (0.23)	20 (0.78)	440T-MDBSE12xx ⁽¹⁾
			13 (0.51)	27 (1.06)	440T-MDBSE13xx ⁽¹⁾
		Primary Key Trapped, Secondary Key Free to Retract Bolt	0	14 (0.55)	440T-MDBSE14xy ⁽¹⁾⁽²⁾
			3 (0.11)	17 (0.66)	440T-MDBSE15xy ⁽¹⁾⁽²⁾
			6 (0.23)	20 (0.78)	440T-MDBSE16xy ⁽¹⁾⁽²⁾
			13 (0.51)	27 (1.06)	440T-MDBSE17xy ⁽¹⁾⁽²⁾

(1) Substitute the desired primary code for x (key not included). See [Key Coding](#) on page 111 for code selection.

(2) Substitute the desired secondary code for y (key not included). See [Key Coding](#) on page 111 for code selection.

Product Selection—Solenoid

Solenoid Voltage	Contact Type	Type	Trapped Key Condition	Bolt Retracted— mm (in.)	Bolt Extended— mm (in.)	Cat. No.
24V DC	2 N.C. & 1 N.O. break before make	Single Key	Free Key to Retract Bolt	0	14 (0.55)	440T-MSBUE10x ⁽¹⁾
				3 (0.11)	17 (0.66)	440T-MSBUE11x ⁽¹⁾
				6 (0.23)	20 (0.78)	440T-MSBUE12x ⁽¹⁾
				13 (0.51)	27 (1.06)	440T-MSBUE13x ⁽¹⁾
			Key Trapped to Retract Bolt	0	14 (0.55)	440T-MSBUE33x ⁽¹⁾
				3 (0.11)	17 (0.66)	440T-MSBUE34x ⁽¹⁾
				6 (0.23)	20 (0.78)	440T-MSBUE35x ⁽¹⁾
				13 (0.51)	27 (1.06)	440T-MSBUE36x ⁽¹⁾
		Dual Key	Both Keys Trapped to Retract Bolt	0	14 (0.55)	440T-MDBUE10xx ⁽¹⁾
				3 (0.11)	17 (0.66)	440T-MDBUE11xx ⁽¹⁾
				6 (0.23)	20 (0.78)	440T-MDBUE12xx ⁽¹⁾
				13 (0.51)	27 (1.06)	440T-MDBUE13xx ⁽¹⁾
			Primary Key Trapped, Secondary Key Free to Retract Bolt	0	14 (0.55)	440T-MDBUE14xy ⁽¹⁾⁽²⁾
				3 (0.11)	17 (0.66)	440T-MDBUE15xy ⁽¹⁾⁽²⁾
				6 (0.23)	20 (0.78)	440T-MDBUE16xy ⁽¹⁾⁽²⁾
				13 (0.51)	27 (1.06)	440T-MDBUE17xy ⁽¹⁾⁽²⁾

(1) Substitute the desired primary code for x (key not included). See [Key Coding](#) on page 111 for code selection.

(2) Substitute the desired secondary code for y (key not included). See [Key Coding](#) on page 111 for code selection.

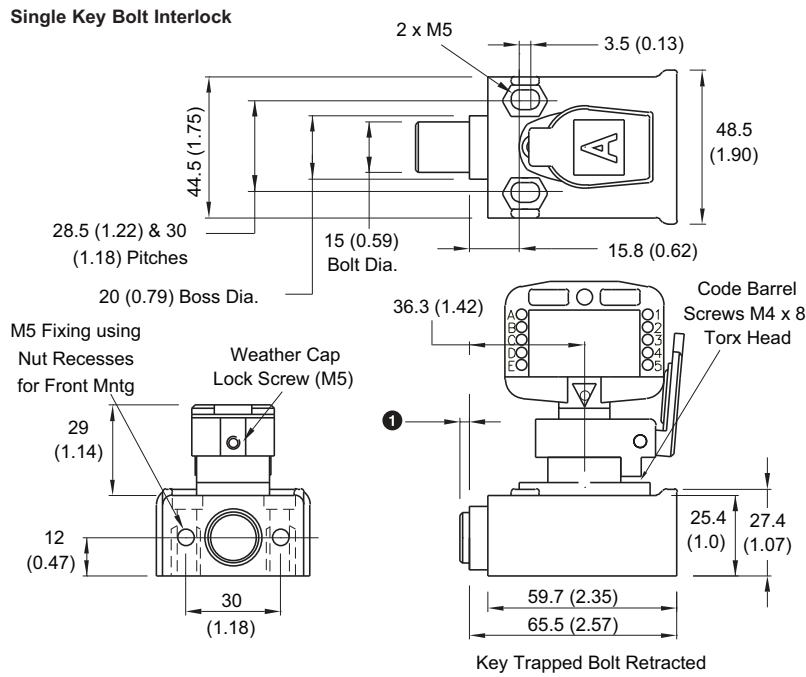
Accessories

Description	Additional Information	Cat. No.
Stainless Steel Key	See Accessories on page 145 .	440T-AKEYE10x ⁽¹⁾
Stainless Steel Replacement Code Barrel for Products Other than 100 A RPS/RKS Units		440T-ASCBE14x ⁽¹⁾
Stainless Steel Weatherproof Replacement Dust Cap		440T-ASF10x ⁽¹⁾
Stainless Steel Ejector Key		440T-AKEYE13x ⁽¹⁾

(1) Substitute the desired primary code for x (key not included). See [Key Coding](#) on page [111](#) for code selection.

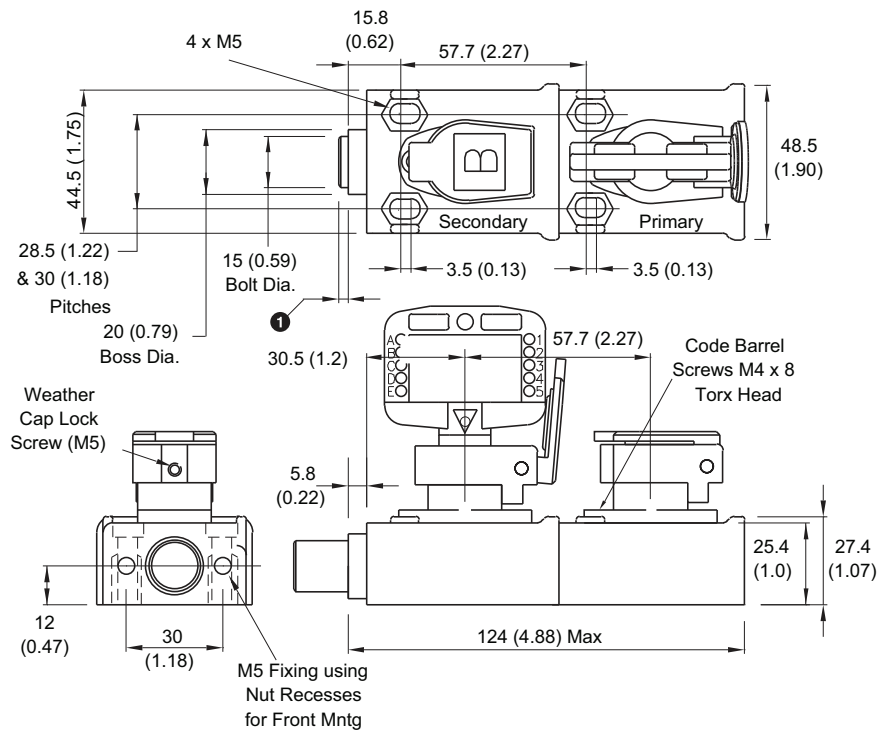
Approximate Dimensions

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



① Standard Retracted Projections 0, 3, 6 & 13 (0, 0.11, 0.23 & 0.51) Extension 14 (0.55)

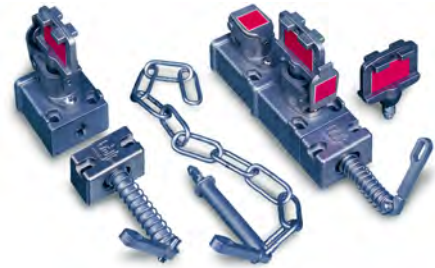
Dual Key Bolt Interlock



Access and Chains Trapped Key Interlock Switches

The access and chains trapped key interlock switches have the following features:

- 316L stainless steel construction
- Direct drive operation
- Fitted with tamper resistant screws
- Stainless steel dust cap as standard
- Replaceable code barrel assembly
- Solenoid and electric versions
- Multiple key options



Specifications

Attribute	Value
Standards	ISO14119, ISO13849-1
Safety Classification	PLd, cat. 3 per ISO13849-1
Certifications	CE marked for all applicable directives; C-Tick not required www.rockwellautomation.com/certification/overview.page
Operating Temperature	-40...+80 °C (-40...+176 °F)
Relative Humidity	95%
Mechanical Life	200,000 operations
Shear Force to Key	15.1 kN (3398 lb)
Torque to Key	14 N·m (124 lb·in)
Material	Faceplate: 316L stainless steel
Mounting	SAL and SCL: 2 or 4 x M5 counterbored from top or 2 or 4 x M5 from underside with nuts
	DAL and DCL: 4 or 6 x M5 counterbored from top or 4 or 6 x M5 from underside with nuts
Weight	SAL and SCL: 0.8 kg (1.8 lb)
	DAL and DCL: 1.35 kg (3 lb)
Misalignment Tolerance	±10 mm (0.39 in.)

Product Selection–Mechanical

Type	Actuator Type	Trapped Key Condition	Cat. No.
Single Key	Lever	Key trapped to release lever	440T-MSALE10x ⁽¹⁾
	Chain	Key trapped to release chain	440T-MSCLE10x ⁽¹⁾
	Extended Lever	Key trapped to release lever	440T-MSALE20x ⁽¹⁾
Single Key with Padlock Hasp	Lever	Key trapped to release lever	440T-MSALE11x ⁽¹⁾
	Chain	Key trapped to release chain	440T-MSCLE11x ⁽¹⁾
Dual Key	Lever	Primary key trapped, secondary key free to release lever	440T-MDALE10xy ⁽²⁾
		Both keys trapped to release lever	440T-MDALE11xx
	Chain	Primary key trapped, secondary key free to release chain	440T-MDCLE10xy
		Both keys trapped to release chain	440T-MDCLE11xx
Dual Key with Padlock Hasp	Lever	Primary key trapped, secondary key free to release lever	440T-MDALE45xy ⁽¹⁾⁽²⁾
Dual Key with Eject Key	Lever	Primary key trapped, secondary spring eject key	440T-MDALJ10xy ⁽¹⁾
	Chain		440T-MDCLJ10xy ⁽¹⁾⁽²⁾
Triple Key	Lever	One primary trapped, two secondary keys free to release lever	440T-MTALE11xyy ⁽¹⁾⁽²⁾
	Chain	One primary trapped, two secondary keys free to release chain	440T-MTCLE11xyy ⁽¹⁾

(1) Substitute the desired primary code for x (key not included). See [Key Coding](#) on page 111 for code selection.

(2) Substitute the desired secondary code for y (key not included). See [Key Coding](#) on page 111 for code selection.

Product Selection–Electrical

Contact Type	Type	Actuator Type	Trapped Key Condition	Cat. No.
2 N.C. and 1 N.O. break before make	Dual Key	Lever	Both keys trapped to release lever	440T-MDASE21xx ⁽¹⁾
			Primary key trapped, secondary key free to release lever	440T-MDASE20xy ⁽¹⁾⁽²⁾
		Chain	Both keys trapped to release chain	440T-MDCSE21xx ⁽¹⁾
			Primary key trapped, secondary key free to release chain	440T-MDCSE20xy ⁽¹⁾⁽²⁾

(1) Substitute the desired primary code for x (key not included). See [Key Coding](#) on page 111 for code selection.

(2) Substitute the desired secondary code for y (key not included). See [Key Coding](#) on page 111 for code selection.

Accessories

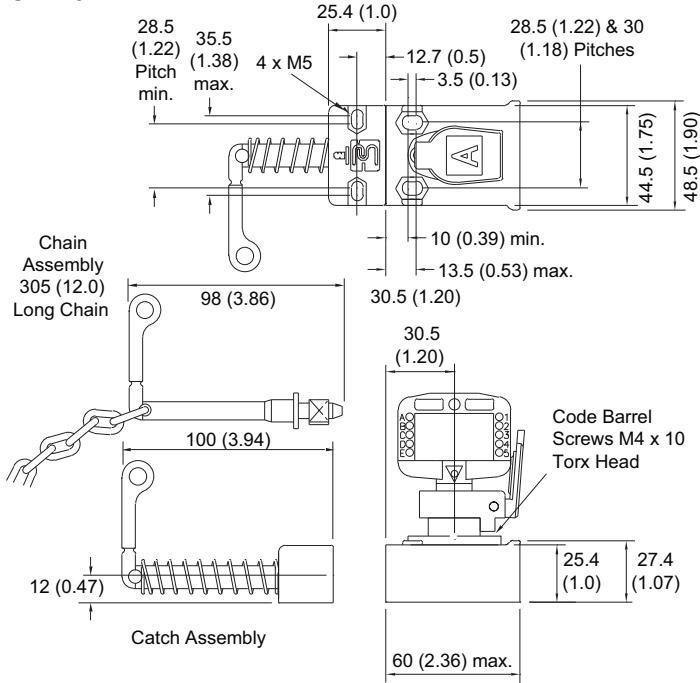
Description	Additional Information	Cat. No.
Stainless Steel Key	See Accessories on page 145.	440T-AKEYE10x ⁽¹⁾
Stainless Steel Replacement Code Barrel for Products Other than 100 A RPS/RKS Units		440T-ASCBE14x ⁽¹⁾
Stainless Steel Weatherproof Replacement Dust Cap		440T-ASF10x ⁽¹⁾
Replacement Spare Block Catch	—	440T-ACAD10
Replacement Spare Chain Catch	—	440T-ACHA10
Stainless Steel Ejector Key	—	440T-AKEYE13x ⁽¹⁾

(1) Substitute the desired primary code for x (key not included). See [Key Coding](#) on page 111 for code selection.

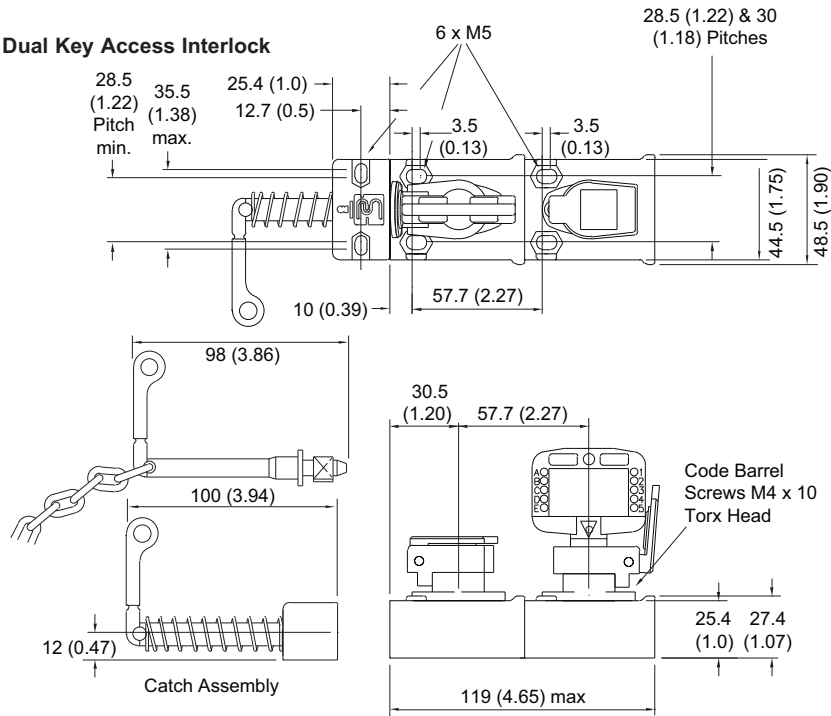
Approximate Dimensions

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

Single Key Access Interlock



Dual Key Access Interlock



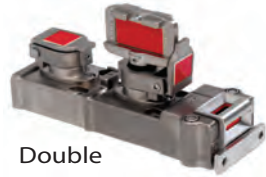
Slamlock Trapped Key Mechanical Interlock Switches

The Prosafe Slamlock™ trapped key mechanical interlock switches have the following features:

- 316L stainless steel construction
- Selection of actuator types available
- Direct drive operation
- Replaceable code barrel assembly
- Fitted with tamper resistant screws
- Weatherproof stainless steel dust cap as standard
- Multiple key options



Single



Double

Specifications

Attribute	Value
Standards	IEC60947-5-1, GS-ET-31, ISO14119, ISO13849-1
Safety Classification	PLd, cat. 3 per ISO13849-1
Certifications	CE marked for all applicable directives; C-Tick not required; TÜV certified www.rockwellautomation.com/certification/overview_page
Operating Temperature	-40...+80 °C (-40...+176 °F)
Relative Humidity	95%
Mechanical Life	200,000 operations
Shear Force to Key	15.1 kN (3398 lb)
Torque to Key	14 N•m (124 lb•in.)
Material	316L stainless steel
Mounting	SSL: 2 x M5 counterbored from top or 2 x M5 from underside with nuts DSS: 4 x M5 counterbored from top or 4 x M5 from underside with nuts
Weight	Single Key: 0.76 kg (1.68 lb) Dual Key: 1.33 kg (2.93 lb)
Code Barrel Life	Tested to 100,000 operations
Ambient Temperature	-10...+50 °C (14...122 °F)
Holding Force, Max.	2000 N (450 lb)

Product Selection

Type	Actuator Type	Trapped Key Condition	Cat. No.
Single Key	Standard	Key trapped to release actuator	440T-MSSLE10x ⁽¹⁾
	Flexible		440T-MSSLE11x ⁽¹⁾
	Flat		440T-MSSLE12x ⁽¹⁾
Dual Key	Standard	Primary key trapped, secondary key free to release actuator	440T-MDSLE10xy ⁽¹⁾⁽²⁾
	Flexible		440T-MDSLE11 ⁽¹⁾⁽²⁾
	Flat		440T-MDSLE12xy ⁽¹⁾⁽²⁾
	Standard	Both keys trapped to release actuator	440T-MDSLE20xx ⁽¹⁾⁽¹⁾
	Flexible		440T-MDSLE22xx ⁽¹⁾⁽¹⁾
	Flat		440T-MDSLE23xx ⁽¹⁾⁽¹⁾

Type	Actuator Type	Trapped Key Condition	Cat. No.
Dual with Secondary Ejector Key	Standard	Primary key trapped, secondary key free to release actuator	440T-MDSLJ10xy ⁽¹⁾⁽²⁾
	Flexible		440T-MDSLJ14xy ⁽¹⁾⁽²⁾
	Flat		440T-MDSLJ12xy ⁽¹⁾⁽²⁾

(1) Substitute the desired primary code for x (key not included). See [Key Coding](#) on page 111 for code selection.

(2) Substitute the desired secondary code for y (key not included). See [Key Coding](#) on page 111 for code selection.

Accessories

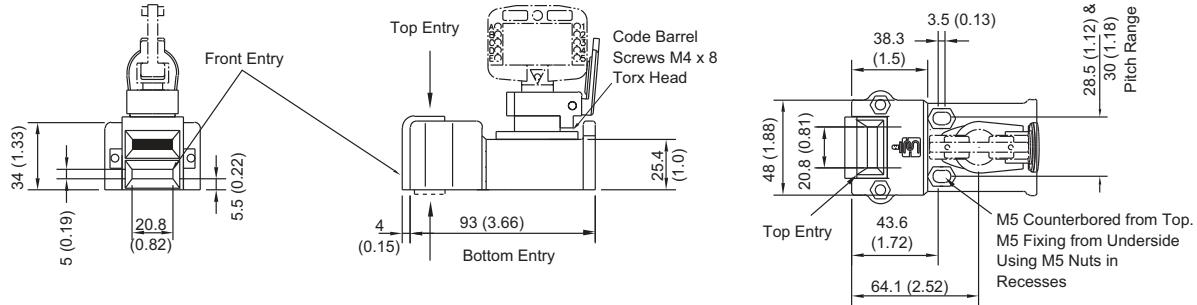
Description	Additional Information	Cat. No.
Stainless Steel Key	See Accessories on page 145.	440T-AKEYE10x ⁽¹⁾
Stainless Steel Replacement Code Barrel for Products Other than 100 A RPS/RKS Units		440T-ASCBE14x ⁽¹⁾
Stainless Steel Weatherproof Replacement Dust Cap		440T-ASF10x ⁽¹⁾
GD2 Standard Actuator	—	440G-A27011
GD2 Flat Actuator	—	440K-A11112
Fully Flexible Actuator	—	440G-A27143
Stainless Steel Ejector Key	—	440T-AKEYE13 ⁽¹⁾

(1) Substitute the desired primary code for x (key not included). See [Key Coding](#) on page 111 for code selection.

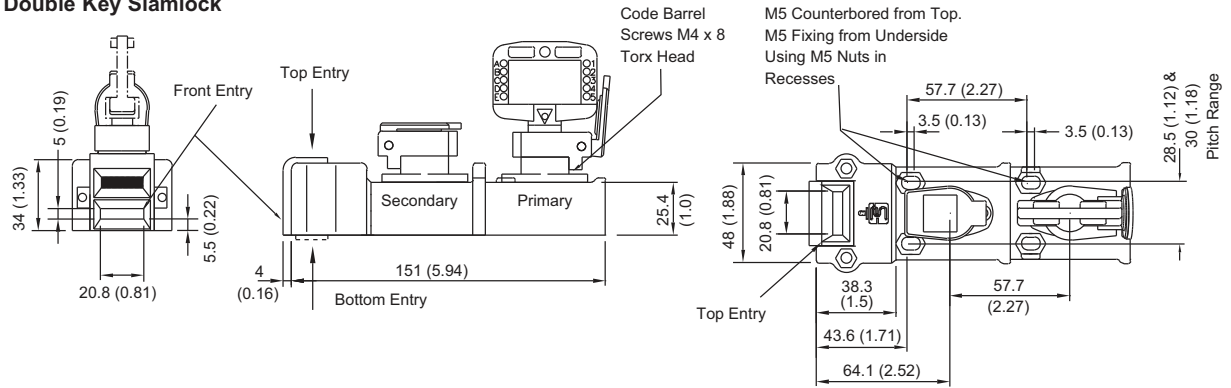
Approximate Dimensions

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

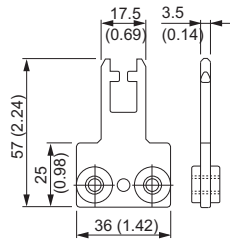
Single Key Slamlock



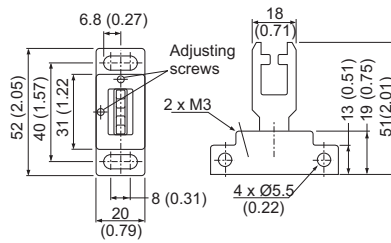
Double Key Slamlock



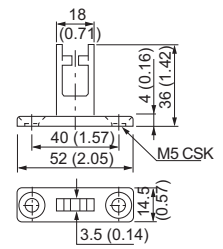
Flat Actuator



Flexible/Adjustable Actuator



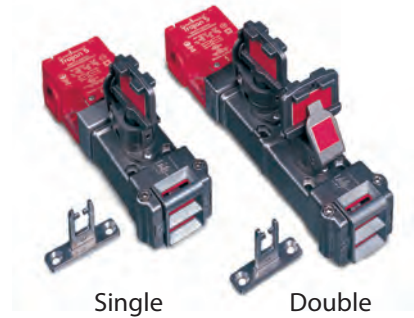
Standard Actuator



Slamlock Trapped Key Electrical Interlock Switches

The Prosafe Slamlock trapped key electrical interlock switches have the following features:

- Electrical safety contacts combined with trapped key/enforced sequence feature
- Most of unit constructed from 316L stainless steel
- Selection of actuator types available
- Single or dual key versions available
- Direct drive operation
- Replaceable code barrel assembly
- Weatherproof stainless steel dust cap as standard
- Solenoid versions



Specifications

Attribute	Value		
Standards	IEC60947-5-1, GS-ET-31, ISO14119, ISO13849-1		
Safety Classification	PLd, cat. 3 per ISO13849-1		
Certifications	CE marked for all applicable directives; C-Tick not required; TÜV certified www.rockwellautomation.com/certification/overview.page		
Operating Temperature	-40...+80 °C (-40...+176 °F)		
Relative Humidity	95%		
Mechanical Life	200,000 operations		
Shear Force to Key	15.1 kN (3398 lb)		
Torque to Key	14 N·m (124 lb·in.)		
Case Material	316L stainless steel UL approved glass-filled polyester		
Actuator Material	Stainless steel		
Mounting	SSS: 4 x M5 counterbored from top or 4 x M5 from underside with nuts DSS: 6 x M5 counterbored from top or 6 x M5 from underside with nuts		
Weight	SSE: 1160 kg (2.6 lb) DSSE: 1700 kg (3.7 lb)		
Ambient Temperature	-10...+50 °C (14...122 °F)		
Holding Force, Max.	2000 N (450 lb)		
Releasable Load, Max.	100 N (22.5 lb)		
Safety Contacts	2 N.C. positive break		
AC 15—Ue	500V	250V	100V
AC 15—Ie	1 A	2 A	5 A
DC	250V	0.5 A, 24V	2 A
Switching Current @ Voltage, Maximum	500V/500V A		
Thermal Current (Ith)	10 A		
Current, Minimum	5V, 5 mA, DC		
Safety Contact Gap	>2 x 2 mm (0.07 in)		
Rated Insulation Voltage	(Ui) 500V		
Rated Impulse withstand Voltage	(Uimp) 2500V		

Attribute	Value
Auxiliary Contacts	1 N.O.
Pollution Degree	3
Actuator Travel for Positive Opening	5 mm (0.19 in)
Operating Radius, Min.	175 mm (6.88 in) (60 mm (2.36 in) with flexible actuator)
Break Contact Force, Min.	12 N (2.7 lbs)
Actuation Speed, Max.	1 m/s
Actuation Frequency, Max.	2 cycle/s
Conduit Entry	3 x M20
Color	Red/Stainless

Product Selection–Electrical

Contact Type	Type	Actuator Type	Trapped Key Condition	Cat. No.
2 N.C. + 1 N.O. Break before make	Single Key	Standard	Key trapped to release actuator	440T-MSSSE10x ⁽¹⁾
		Flexible		440T-MSSSE11x ⁽¹⁾
		Flat		440T-MSSSE12x ⁽¹⁾
		Standard	Key free to release actuator	440T-MSSSE20x ⁽¹⁾
		Flexible		440T-MSSSE22x ⁽¹⁾
		Flat		440T-MSSSE23x ⁽¹⁾
	Dual Key	Standard	Primary key trapped, secondary key free to release actuator	440T-MDSSE10xy ⁽¹⁾⁽²⁾
		Flexible		440T-MDSSE11xy ⁽¹⁾⁽²⁾
		Flat		440T-MDSSE12xy ⁽¹⁾⁽²⁾
		Standard	Primary key trapped, secondary key eject to release actuator	440T-MDSSJ10xy ⁽¹⁾⁽²⁾
		Flexible		440T-MDSSJ11xy ⁽¹⁾⁽²⁾
		Flat		440T-MDSSJ12xy ⁽¹⁾⁽²⁾
		Standard	Both keys trapped to release actuator	440T-MDSSE20xx ⁽¹⁾
	Flexible	440T-MDSSE22xx ⁽¹⁾		
	Flat	440T-MDSSE23xx ⁽¹⁾		
2 N.C. + 2 N.O. Break before make	Single key	Standard	Key free to release actuator	440T-MSSSE26x ⁽¹⁾
		Flexible		440T-MSSSE27x ⁽¹⁾
		Flat		440T-MSSSE25x ⁽¹⁾

(1) Substitute the desired primary code for this symbol (key not included). See [Key Coding](#) on page 111 for code selection.

(2) Substitute the desired secondary code for this symbol (key not included). See [Key Coding](#) on page 111 for code selection.

Product Selection–Solenoid

Contact Type	Type	Trapped Key Condition	Solenoid Voltage	Actuator Type	Cat. No.
2 N.C. + 1 N.O. Break before make	Single key	Key free to release actuator	24V DC	Standard	440T-MSSUE20x ⁽¹⁾
				Flexible	440T-MSSUE22x ⁽¹⁾
				Flat	440T-MSSUE23x ⁽¹⁾
	Dual key	Primary key trapped, secondary key free to release actuator	24V DC	Standard	440T-MDSUE10x ⁽¹⁾
				Flexible	440T-MDSUE11x ⁽¹⁾
				Flat	440T-MSSUE12x ⁽¹⁾
	Single key	Key free to release actuator	110V AC	Standard	440T-MSSUE50x ⁽¹⁾

(1) Substitute the desired primary code for x (key not included). See [Key Coding](#) on page 111 for code selection.

Accessories

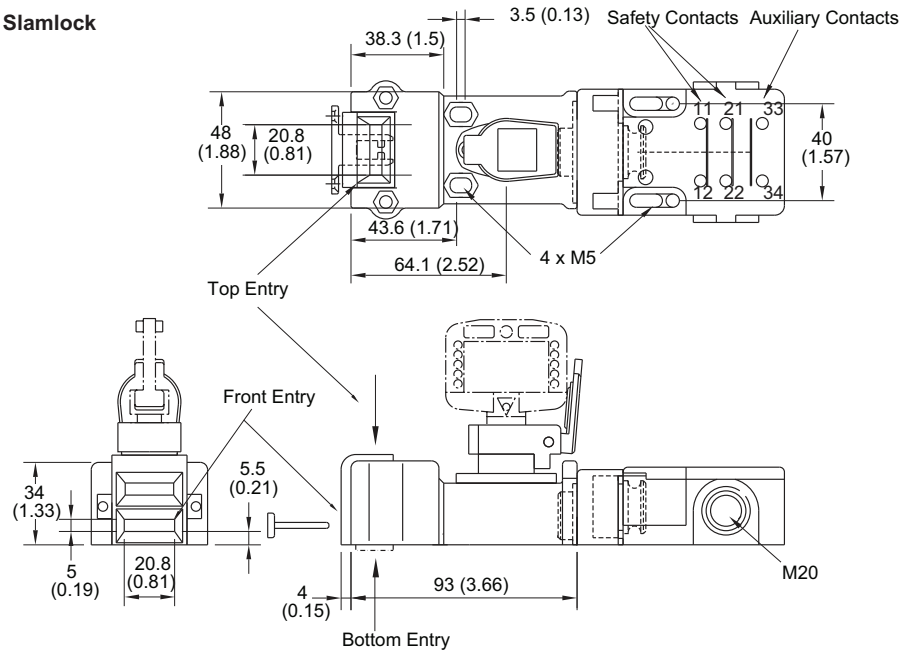
Description	Additional Information	Cat. No.
Stainless Steel Key	See Accessories on page 145.	440T-AKEYE10x ⁽¹⁾
Stainless Steel Replacement Code Barrel for Products Other than 100 A RPS/RKS Units		440T-ASCBE14x ⁽¹⁾
Stainless Steel Weatherproof Replacement Dust Cap		440T-ASFC10x ⁽¹⁾
GD2 Standard Actuator	—	440G-A27011
GD2 Flat Actuator	—	440K-A11112
Fully Flexible Actuator	—	440G-A27143
Stainless Steel Ejector Key	—	440T-AKEYE13x ⁽¹⁾

(1) Substitute the desired primary code for x (key not included). See [Key Coding](#) on page 111 for code selection.

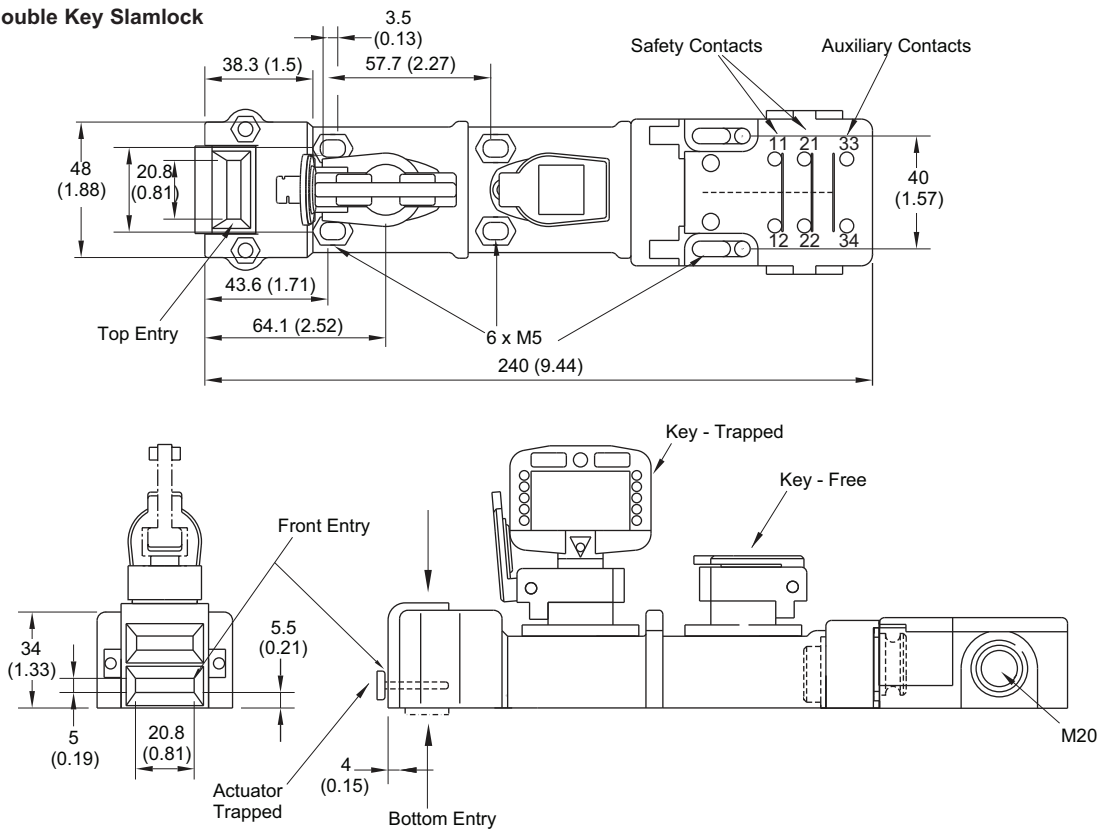
Approximate Dimensions

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

Single Key Slamlock



Double Key Slamlock



Miniature Valve Trapped Key Interlock Switches

The miniature valve trapped key interlock switches have the following features:

- Direct drive operation
- Supplied with valves 0.25...1 inch
- Direct body mounting with security screws
- Locked open or locked closed options
- Lower maintenance cost
- Weatherproof stainless steel dust cap as standard
- Replaceable code barrel assembly
- Valve is chrome-plated brass



Specifications

Attribute	Value
Standards	ISO14119, ISO13849-1
Safety Classification	PLd, cat. 3 per ISO 13849-1
Certifications	CE marked for all applicable directives and TÜV certified www.rockwellautomation.com/certification/overview.page
Operating Temperature	-40...+80 °C (-40...+176 °F)
Relative Humidity	25...95%
Mechanical Life	200,000 operations
Shear Force to Key	15.1 kN (3398 lb)
Torque to Key	14 N·m (124 lb·in.)
Material	316L stainless steel

Product Selection

Valve Size—Inch BSP ⁽¹⁾	Valve Status	Cat. No.
0.25	Key Free/Valve Locked Closed	440T-VMVLE10x ⁽²⁾
0.375		440T-VMVLE11x ⁽²⁾
0.5		440T-VMVLE12x ⁽²⁾
0.25	Key Free/Valve Locked Open	440T-VMVLE13x ⁽²⁾
0.375		440T-VMVLE14x ⁽²⁾
0.5		440T-VMVLE15x ⁽²⁾
1.0	Key Free/Valve Locked Closed	440T-VMVLE18x ⁽²⁾
	Key Free/Valve Locked Open	440T-VMVLE19x ⁽²⁾

(1) BSP = British standard pipe threads

(2) Substitute the desired primary code for x (key not included). See [Key Coding](#) on page 111 for code selection.

Trapped Key Switchgear Adaptors

The trapped key switchgear adaptors have the following feature:

- Lower maintenance cost

Specifications

Attribute	Value
Standards	ISO14119
Certifications	CE Marked for all applicable directives and BG
Operating Temperature [C (F)]	-10...+150 ° (14...122 °)
Mechanical Life	>200,000 operations
Shear Force to Key	15.1 k-N (3398 lb), max.
Torque to Key	14 N·m (124 lb·in.) max.
Relative Humidity	95%
Weight [kg (lb)]	316L stainless steel
Material	2 x M4
Shaft Dimensions	3/8 in. ² x 7/8 in. long (standard) 9/16 in. diameter x 7/8 in. long (optional: contact factory)



Product Selection (3/8 sq shaft)

Mounting	Trap Direction	Cat. No.
2 x M4	65° CW to trap	440T-MSGAU10x ⁽¹⁾
	65° CCW to trap	440T-MSGAU11x ⁽¹⁾
	90° CW to trap	440T-MSGAU12x ⁽¹⁾
	90° CCW to trap	440T-MSGAU13x ⁽¹⁾
	±90° to trap	440T-MSGAU14x ⁽¹⁾
	45° CW to trap	440T-MSGAU17x ⁽¹⁾
	45° CCW to trap	440T-MSGAU18x ⁽¹⁾

(1) Substitute the desired primary code for x (key not included). See [Key Coding](#) on page 111 for code selection.

Accessories


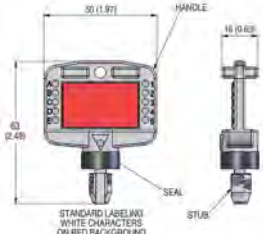



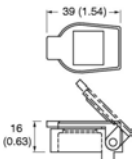

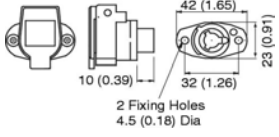

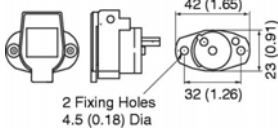

Description	Additional Information	Cat. No.
Stainless Steel Key	See Accessories on page 145.	440T-AKEYE10x ⁽¹⁾
Stainless Steel Replacement Code Barrel for Products Other than 100 A RPS/RKS Units		440T-ASCBE14x ⁽¹⁾
Stainless Steel Weatherproof Replacement Dust Cap		440T-ASF10x ⁽¹⁾

(1) Substitute the desired primary code for x (key not included). See [Key Coding](#) on page 111 for code selection.



WARNING: The presence of spare keys, override keys, or spare actuators can compromise the integrity of safety interlocking systems. Personal injury or death, property damage, or economic loss can result from the introduction of spare keys, override keys or spare actuators into interlocking systems without appropriate management controls, working procedures and alternative protective measures to control their use and availability.

Accessories

Description		Cat. No.	
	<p>Stainless steel key</p>		<p>440T-AKEYE10x⁽²⁾</p>
	<p>Stainless steel ejector key</p>		<p>440T-AKEYE13x⁽²⁾</p>
	<p>Stainless steel ejector key</p>		<p>440T-ASFC10x⁽²⁾</p>
	<p>Stainless steel replacement code barrel for 100 A unit rotary switch</p>		<p>440T-ASCBE11x⁽²⁾</p>
	<p>Stainless steel replacement code barrel with dust cap⁽¹⁾</p>		<p>440T-ASCBE14x⁽²⁾</p>
<p>Emergency break glass key box</p>		<p>Plastic case</p>	<p>440T-AIPB11</p>
		<p>Metal case with hammer</p>	<p>440T-AIPB12</p>
	<p>Emergency repair kit for code barrels⁽¹⁾</p>	<p>ER1</p>	<p>440T-AKITE45ER1</p>
		<p>ER2</p>	<p>440T-AKITE45ER2</p>
		<p>ER3</p>	<p>440T-AKITE45ER3</p>
		<p>ER4</p>	<p>440T-AKITE45ER4</p>
		<p>ER5</p>	<p>440T-AKITE45ER5</p>
		<p>ER6</p>	<p>440T-AKITE45ER6</p>
		<p>ER7</p>	<p>440T-AKITE45ER7</p>
		<p>ER8</p>	<p>440T-AKITE45ER8</p>
		<p>ER9</p>	<p>440T-AKITE45ER9</p>

(1) Not suitable for 440T-MRKSE14/440T-MRPSE14 OR 440T-MSGAU units.

(2) Substitute the desired primary code for x (key not included). See [Key Coding](#) on page 111 for code selection.

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
Dynamix™ 1443 Series Sensors Product Information, publication 1443-PC001	Included with hazardous area rated sensors, provides basic environmental, ratings, and mounting information.
Dynamix™ 1443 Series Sensors User Manual, publication 1443-UM001	Provides complete information for mounting and cabling 1443 Series sensors.
Cordsets & Field Attachables Technical Data, publication 889-TD002	Provides an overview of cordsets and field attachables that Rockwell Automation provides.
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.

You can view or download publications at <http://www.rockwellautomation.com/global/literature-library/overview.page>.

Rockwell Automation Support

Use the following resources to access support information.

Technical Support Center	Knowledgebase Articles, How-to Videos, FAQs, Chat, User Forums, and Product Notification Updates.	www.rockwellautomation.com/knowledgebase
Local Technical Support Phone Numbers	Locate the phone number for your country.	www.rockwellautomation.com/global/support/get-support-now.page
Direct Dial Codes	Find the Direct Dial Code for your product. Use the code to route your call directly to a technical support engineer.	www.rockwellautomation.com/global/support/direct-dial.page
Literature Library	Installation Instructions, Manuals, Brochures, and Technical Data.	www.rockwellautomation.com/literature
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	www.rockwellautomation.com/global/support/pcdc.page

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