

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 help 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 must 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 help prevent a machine from starting when the guard is open.

Summary of Changes

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

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Added 440G-MZ Guard Locking Switches section	3
Updated the 440G-LZ Guard Locking Switch Approximate Dimensions section	7
Updated the TLS-Z GD2 Guard Locking Switch Product Selection table	10
Updated Sprite Miniature Hinge Interlock Switches Specifications table.	29
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Added Interlocking Switches with Guard Locking for Process Protection section.	41
Updated 440G-EZ Electromagnetic Safety Switches Specifications table.	41
Updated SensaGuard Non-contact Interlock Switches Specifications table.	45
Added 6 in. Pigtail, 5-pin micro (M12) cat. nos. to SensaGuard™ Product Selection table.	46
Updated Table 24	46
Added Table 26	49
Updated Trapped Key Interlock Switches section (changes throughout section).	95

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 rok.auto/literature.

440G-MZ Guard Locking Switches

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

- Certified to SIL 3, PLe, Cat 4 for door position monitoring and guard locking
- Embedded GuardLink® technology
- Type 4 interlocking device with guard locking per ISO 14119 with low or high coded RFID actuators
- High holding force of 2500 N
- Flexible actuator
- ±5 mm (0.2 in.) misalignment tolerance
- Energy-efficient bi-stable solenoid
- IP69K
- Power to Release and Power to Lock models
- DEVICE and LINK status is provided by two bright 270° status indicators



Specifications

Attribute	Value
Standards	IEC 60947-5-3, IEC 61508, ISO 13849-1, IEC 62061, ISO 14119, UL 508
Safety classification	Type 4 interlocking device with guard locking per ISO 14119 with low (standard) and high (unique) coding per ISO 14119 Suitable for use in applications up to and including PLe Cat 4 per ISO 13849-1, SIL CL 3 per IEC 62061, and SIL 3 per IEC 61508
Functional safety data	See publication 440G-UM004
Certifications	CE Marked for all applicable EU directives, cULus, TÜV
Operating Characteristics	
Torque for M5 mounting of switch and actuator mounting bracket, max	2 N•m (17.7 lb•in)
Torque, auxiliary release access screw (escape release model)	0.56 N•m (5 lb•in)
Locking bolt alignment tolerance X, Y, Z, max	±5 mm (0.2 in.)
Holding force F _{max} (ISO 14119)	3250 N
Holding force F _{zh} (ISO 14119)	2500 N
Output current, max (each output)	200 mA
Quiescent power consumption, locked or unlocked	1.5 W
Lock signal current	1 mA
Peak current and duration, at turn on or after lock/unlock operation	150 mA for approximately 800 ms following lock/unlock operation.
Steady state current, max	<ul style="list-style-type: none"> • OSSD mode: 40 mA • GuardLink mode: 50 mA
Operating voltage U _e	24V DC +10% / -15% Class 2 PELV
Operating cycle frequency, max	0.2 Hz
Dwell time between subsequent locking/unlocking	2.5 s
Response time (Off) (IEC 60947-5-3)	275 ms
Start-up time (availability)	8 s
Utilization category (IEC 60947-5-2)	DC-13 24V 200 mA

Attribute	Value	
Insulation voltage U _i (IEC 60947-5-1)	75V	
Impulse withstand voltage U _{imp} (IEC 60947-5-1)	1 kV	
Pollution degree (IEC 60947-5-1)	3	
Auxiliary release	Built-in	
Escape release	Built-in (select models)	
Protection class (IEC 61140)	Class II	
Mechanical life	500,000 cycles	
Outputs (Guard door is closed and locked)		
Safety outputs	2 x PNP, 0.2 A max / ON (+24V DC)	
Environmental		
Operating temperature	0...55 °C (32...131 °F)	
Storage temperature	-25...+75 °C (-13...+167 °F)	
Operating humidity	5...95%, noncondensing	
Enclosure ingress rating	IP65, IP66, IP67, IP69, and IP69K	
Shock and vibration	<ul style="list-style-type: none"> • IEC 60068-2-27, 30 g (1.1 oz), 11 ms • IEC 60068-2-6, 10...55 Hz, 1 mm (0.4 in.) 	
Radio frequency/EMC	IEC 60947-5-3, FCC-1 (Parts 18 and 15), RED	
General		
Materials	Switch	Housing - ABS; front brace - SS304 (machined); SS316 (cast)
	Actuator	Housing and housing cover - SS304; spring - SS302; grommet - nitrile rubber; screws - stainless steel; tongue - SS410
	Brackets	High-strength low-alloy steel
	Accessories	Padlock - SS410; button - aluminum, powder painted; auxiliary release tool - SS304 with SS201 key ring; screw - steel
Weight	Switch	0.75 kg (1.7 lb)
	Actuator	0.27 kg (0.6 lb)
	Brackets	<ul style="list-style-type: none"> • Actuator L: 0.27 kg (0.6 lb); • Actuator Z: 0.54 kg (1.2 lb) • Switch L: 1 kg (2.2 lb)
Protection Type	Short-circuit, current limitation, overload, reverse polarity, overvoltage (up to 60V max), thermal shutdown/restart	

Product Selection

Table 1 - Catalog Number Explanation

440G-MZS 20 S N R J E
 a b c d e f

a	
Outputs (Safety/Auxiliary)	
Code	Description
20	Two safety/no aux

b	
Actuator Code	
Code	Description
S	Standard code
U	Unique code

c	
Auxiliary Type	
Code	Description
N	No auxiliary

d	
Lock Type	
Code	Description
R	Power to Release
L	Power to Lock

e	
Connection Type	
Code	Description
J	M12 5-pin

f	
Special Features	
Code	Description
Blank	None
E	Escape release

Table 2 - Complete Switches, Including Switch Body and Actuator




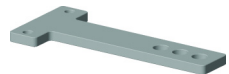



Type	Actuator Coding	Escape Release	Cat No.
Power to Release	Standard (Low level to ISO 14119)	No	440G-MZS20SNRJ
	Unique (High level to ISO 14119)		440G-MZS20UNRJ
Power to Lock	Standard (Low level to ISO 14119)		440G-MZS20SNLJ
	Unique (High level to ISO 14119)		440G-MZS20UNLJ
Power to Release	Standard (Low level to ISO 14119)	Yes	440G-MZS20SNRJE
	Unique (High level to ISO 14119)		440G-MZS20UNRJE
Power to Lock	Standard (Low level to ISO 14119)		440G-MZS20SNLJE
	Unique (High level to ISO 14119)		440G-MZS20UNLJE

Accessories

Table 3 - Spare Actuators

Description	Cat. No.
Standard code actuator (Low level to ISO 14119)	440G-MZAS
Unique code actuator (High level to ISO 14119)	440G-MZAU

Table 4 - Accessories

Description	Cat. No.
 Actuator mounting bracket L-shaped	440G-MZAM1
	 Z-shaped 440G-MZAM2
 Switch mounting bracket 440G-MZAM3	440G-MZAM3
 Padlock accessory 440G-MZAL	440G-MZAL
 Auxiliary release tool 440G-MZAT	440G-MZAT
 Replacement screw 440G-MZRSC	440G-MZRSC
 Replacement button 440G-MZRBU	440G-MZRBU

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 1300 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 that is optimized for ease of mounting
- Diagnostic information provided by two bright 270° status indicators
- 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	See publication SAFETY-SR001
Certifications	cULus Listed, TÜV Certified, and CE Marked for all applicable directives rok.auto/certifications
Operating characteristics	
Torque for M5 mounting of switch and actuator mounting bracket, max	2 N·m,
Locking bolt insertion for assured locking and 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)	1690 N
Holding force Fzh (ISO 14119)	1300 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
Frequency of operating cycles, max	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
Length of a chain of switches, max	10 km (6.2 mi) 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 (0.04 in.)
Hygienic	ISO 14159:2004 and EN 1672-2005 (for that part of the machine that is defined as "food splash area")
Washdown	Sodium Hydroxide based washdown fluids
Radio frequency / EMC	IEC 60947-5-3, FCC-1 (Parts 18 and 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 (9.8 ft) Lead	10 m (32.8 ft) Lead	6 in. (152.4 mm) Pigtail with M12 8-pin QD	3 m (9.8 ft) Lead	10 m (32.8 ft) Lead	6 in. (152.4 mm) 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 6 - 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 7 - 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.

Figure 4 - Switch Body

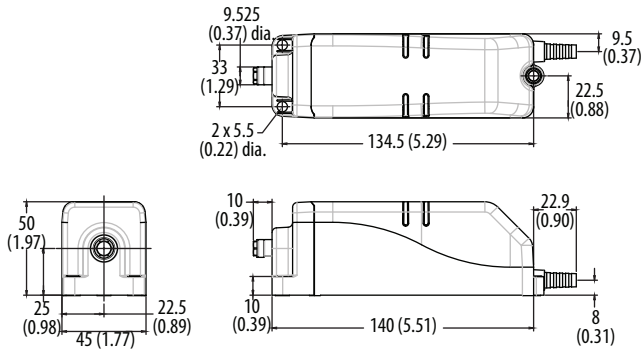


Figure 6 - Switch Mounting Bracket (440G-LZAM2)

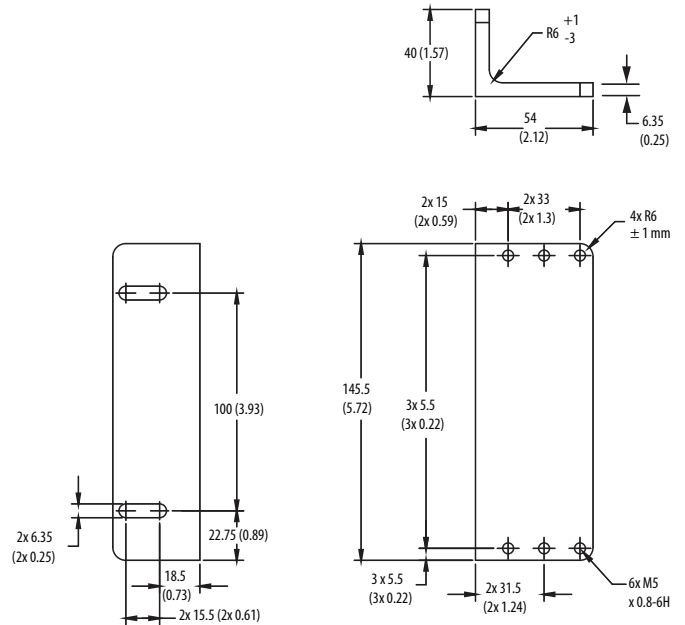
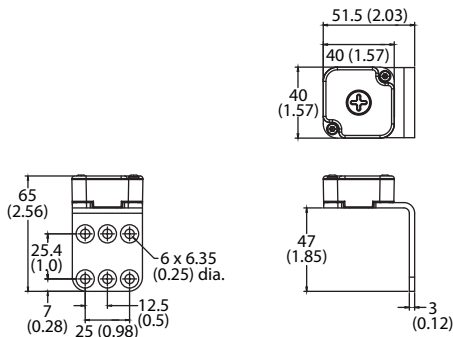
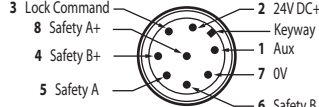


Figure 5 - Actuator and Actuator Mounting Bracket (440G-LZAM1)



Typical Wiring Diagrams

<p>8-pin Micro (M12)</p>			
	<p>8-pin Cordset 889D-F8AB-x⁽¹⁾ or Cable Version</p>	<p>Color</p>	<p>Function</p>
	White	Aux	1
	Brown	24V DC +	2
	Green	Lock	3
	Yellow	Safety B+	4
	Gray	Safety A	5
	Pink	Safety B	6
	Blue	Gnd/OV	7
	Red	Safety A+	8

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

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)

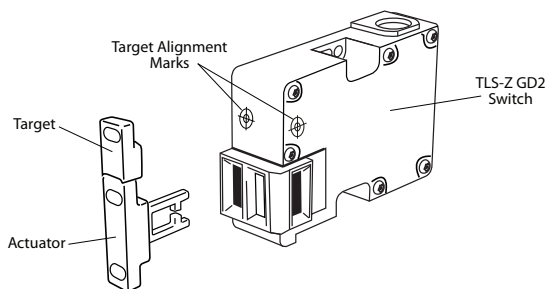


Specifications

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	See publication SAFETY-SR001
Certifications	cULus Listed, TÜV Certified, and CE Marked for all applicable directives rok.auto/certifications
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	<ul style="list-style-type: none"> • Door target distance, max: 13 mm (0.51 in.) • Clearance between actuator base and switch in door-closed position, max: 5 mm (0.2 in.)
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)	<ul style="list-style-type: none"> • Plastic pins: 1950 N (488 lbf) • Steel bolts: 2600 N (585 lbf)
Holding force F_{zh} (ISO 14119)	<ul style="list-style-type: none"> • 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%
Number of switches (connected in series), max	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 first switch, 25 ms each additional switch (Off)
Utilization category	DC-13 24V 200 mA (IEC 60947-5-2)
Rated impulse withstand voltage	250V
Pollution degree	3
Protection Type	2





Attribute	Value
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 (0.04 in.)
Frequency	IEC 61000-4-3, IEC 61000-4-6
Physical characteristics	
Material	<ul style="list-style-type: none"> • Housing: UL Approved glass-filled PBT • Actuator: Stainless steel
Target type	UL Approved glass-filled PBT
Weight	400 g (0.88 lb)
Color	Red





Product Selection



Locking Type	Actuator Type	Connector Type	Cat. No.	
			Aux. Output = Lock Aux.	Aux. Output = Door Aux.
Power to Release	Unique (high level to ISO 14119)	8-in. Pigtail with M12 8-pin QD	440G-TZS21UPRH	440G-TZS21UTRH
Power to Lock			440G-TZS21UPLH	440G-TZS21UTLH

Accessories

Description	Cat. No.
 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

Description	Cat No.
 Emergency override key (See the following Attention)	440G-A36026
 Flexible release—1 m (3.3 ft) cable	440G-A27356 ⁽¹⁾
 Flexible release—3 m (9.8 ft) cable	440G-A27357 ⁽¹⁾
 Dust cover	440K-A17183

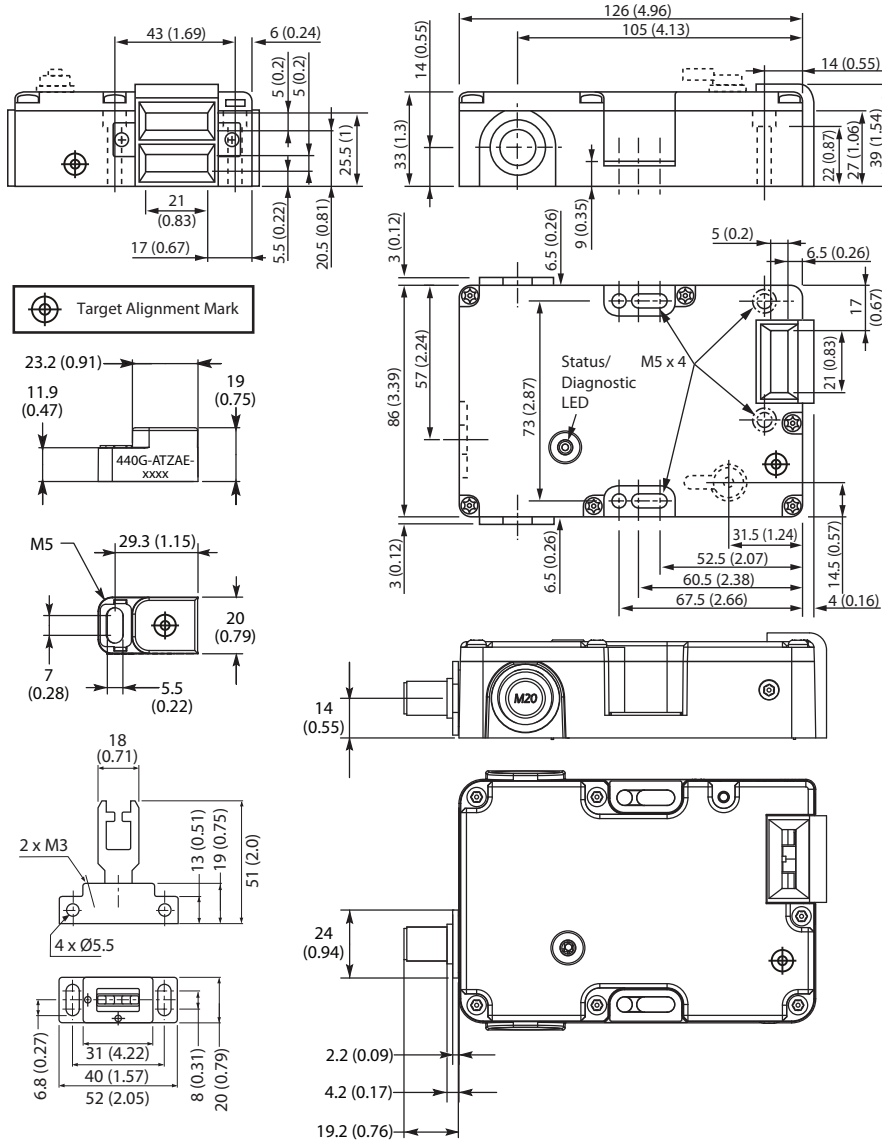
(1) Flexible release cannot be used with Power to Lock switches.



ATTENTION: Do not attach the emergency override key to the TLS-Z-GD2 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)			
Color	Function	Pin	
White	Aux	1	
Brown	24V DC +	2	
Green	Lock	3	
Yellow	Safety B+	4	
Gray	Safety A	5	
Pink	Safety B	6	
Blue	Gnd/OV	7	
Red	Safety A+	8	

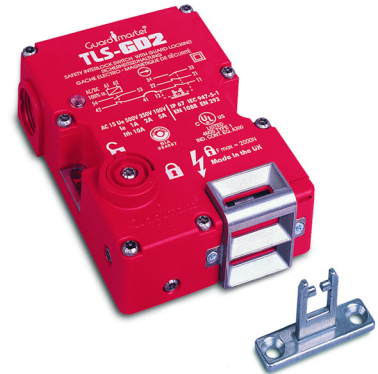
(1) Replace x with 2 (2 m [6.6 ft]), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) for standard cable lengths.

Guard Locking Switches – Electromechanical Switches (Voltage-free Contacts)

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: Four 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	See publication SAFETY-SR001			
Certifications	cULus Listed, TÜV Certified, and CE Marked for all applicable directives rok.auto/certifications			
Outputs				
Safety contacts ⁽¹⁾	<ul style="list-style-type: none"> • TLS-1 and -2: 3 N.C. direct opening action • TLS-3: 4 N.C. direct opening action 			
Auxiliary contacts	<ul style="list-style-type: none"> • TLS-1 and -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				
Holding force F_{max} (ISO 14119)	<ul style="list-style-type: none"> • Plastic pins: 1950 N (488 lbf) • Steel bolts: 2600 N (585 lbf) 			
Holding force F_{zh} (ISO 14119)	<ul style="list-style-type: none"> • 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)			

Attribute	Value
Operating Characteristics	
Break contact force, min	20 N (4.5 lbf)
Actuation speed, max	160 mm (6.29 in.)/s
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	
Material	<ul style="list-style-type: none"> • Housing: UL Approved glass-filled PBT • Actuator: Stainless steel
Weight	400 g (0.88 lb)
Color	Red

(1) The safety contacts are described as normally closed (N.C.) that is, 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 Adapter	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	—
					Fully flexible	440G-T21BGPM-1B	440G-T21BGPT-1B	440G-T21BGPL-1B	—
				110V AC/DC	—	440G-T21BNPM-4B	440G-T21BNPT-4B	—	—
					GD2 Standard	440G-T21BGPM-4B	440G-T21BGPT-4B	—	—
					Fully Flexible	440G-T21BGPM-4B	440G-T21BGPT-4B	—	—
230V AC/DC	—	440G-T21BNPM-5B	440G-T21BNPT-5B	—	—				
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-T2NBNPH-2B
					GD2 Standard	440G-T21BGPM-2B	440G-T21BGPT-2B	440G-T21BGPL-2B	—
					Fully flexible	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	—	—
					Fully Flexible	440G-T21BGPM-5B	440G-T21BGPT-5B	—	—
230V AC/DC	—	440G-T21BNPM-5B	440G-T21BNPT-5B	—	—				

(1) For connector ratings, see [Table 10](#).

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

Table 8 - Connection Systems

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

(1) The 9-wire cordset can be used only with the TLS3 versions.

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








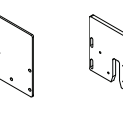
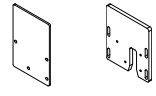
(3) Replace y with 1 (1 m [3.3 ft]), 2 (2 m [6.6 ft]), 3 (3 m [9.8 ft]), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) for standard cable lengths.

(4) Replace z with OM3 (0.3 m [1 ft]), OM6 (0.6 m [2 ft]), 1 (1 m [3.3 ft]), 2 (2 m [6.6 ft]), or 3 (3 m [9.8 ft]) for standard lengths.

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 the following Attention)	440G-A36026
 Flexible release—1 m (3.3 ft) cable	440G-A27356 ⁽¹⁾
 Flexible release—3 m (9.8 ft) cable	440G-A27357 ⁽¹⁾
 Dust cover	440K-A17183
 Sliding bolt	440K-AMDS

(1) Flexible release cannot be used with Power to Lock switches.

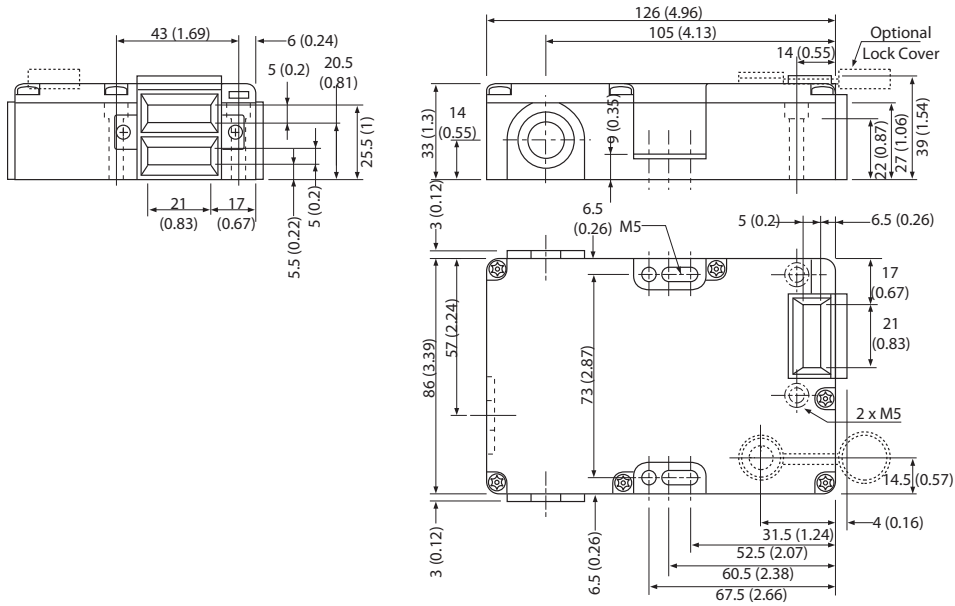
Description	Cat. No.
 Cover for TLS-1 with external override key for series D and earlier	440G-A27140
 Cover for TLS-3 with external override key for series D and earlier	440G-A27142
 Cover for TLS-1 with override key attached for series D and earlier	440G-A27207
 Cover for TLS-3 with override key attached 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-AMDSMPB



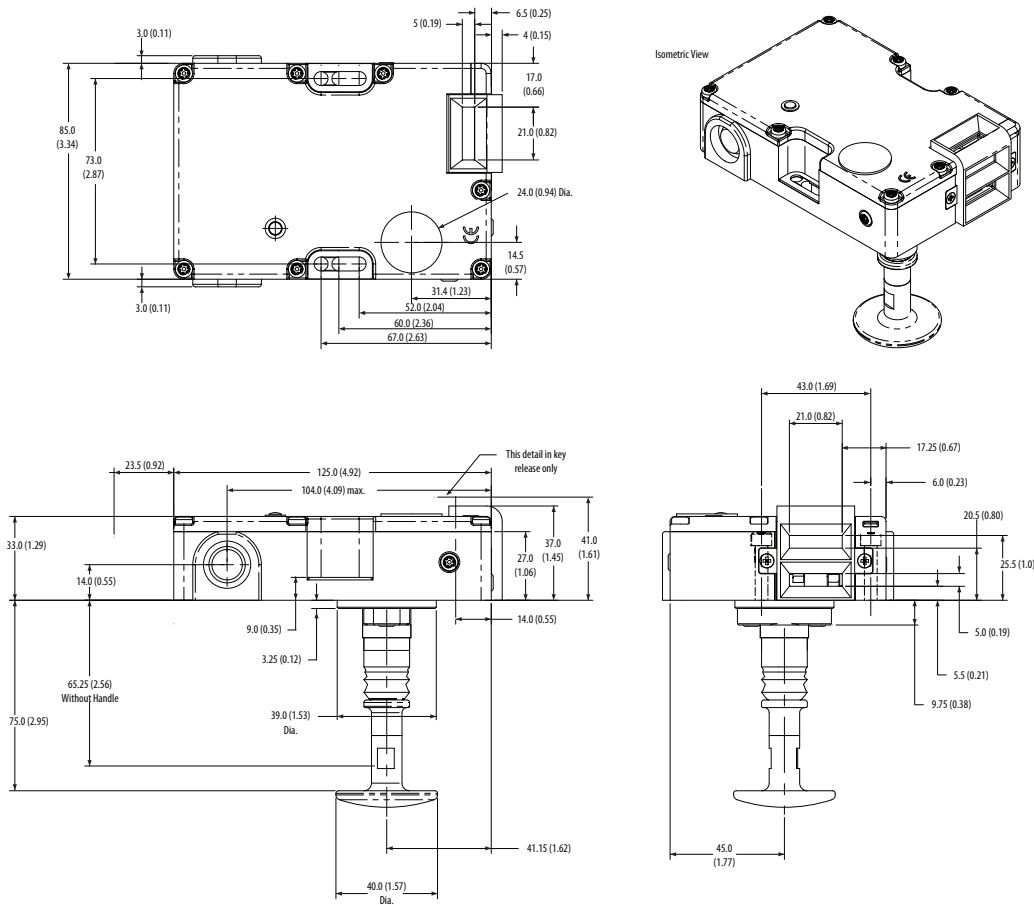
ATTENTION: Do not attach the emergency override key to the TLS-GD2 switch.

Approximate Dimensions

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



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 □ Open ■ Closed		<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 ⁽¹⁾	4 and 12	Safety A ⁽¹⁾
		7 and 8	Safety B	7 and 5	Safety B ⁽¹⁾
		9 and 10	Aux A	9 and 10	Aux A
		6 and 11	Solenoid A ⁽¹⁾	6 and 11	Solenoid A ⁽¹⁾
		2 and 5	Solenoid B	2 and 8	Solenoid B ⁽¹⁾
8-pin Cordset 889D-F8AB-x ⁽²⁾	Brown Blue	Solenoid power		Solenoid power	
	Gray Red	Safety A		Safety A and Solenoid A	
	Yellow Pink	Safety B		Safety B and Solenoid B	
	White Green	Solenoid A		Solenoid A	
12-pin, 9-wire Cordset 889M-F12X9AE-x ⁽²⁾ (Pink/Yellow: Not connected)		Cannot be used		Brown Blue	Solenoid Power
				White Green	Safety A and Solenoid A
				Yellow Gray	Safety B and Solenoid B
				Pink Red	Aux A
12-pin, 12-wire Cordset 889M-F12AH-x ⁽²⁾	Brown Gray	Solenoid Power		Brown Gray	Solenoid Power
	Pink Green	Safety A ⁽¹⁾		Pink Green	Safety A ⁽¹⁾
	White Red/Blue	Safety B		White Red	Safety B ⁽¹⁾
	Black Violet	Aux A		Black Violet	Aux A
	Gray/Pink Yellow	Solenoid A ⁽¹⁾		Grey/Pink Yellow	Solenoid A ⁽¹⁾
	Blue Red	Solenoid B		Blue Red/Blue	Solenoid B ⁽¹⁾

(1) See warning statements on [page 17](#).

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



WARNING: To monitor independently one or more safety contacts 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 from 12 to 41 must be removed
 - For the TLS3: the jumpers between 12 and 41 and 22 and 51 must be removed
-



WARNING: Monitoring of one or more safety contacts 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⁾)
-

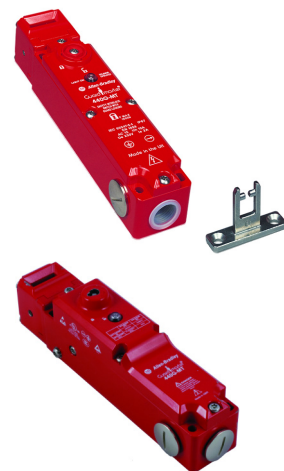
(1) Replace x with 2 (2 m [6.6 ft]), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) for standard cable lengths.

440G-MT Guard Locking Switches

The 440G-MT solenoid switch locks a machine guard closed and can 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 status indicator 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	See publication SAFETY-SR001			
Certifications	cULus Listed, TÜV Certified, and CE Marked for all applicable directives (rok.auto/certifications)			
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_{th}	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			
Environmental				
Enclosure type rating	IP67			
Operating temperature	-25...+60 °C (13...140 °F)			
Physical Characteristics				
Material	<ul style="list-style-type: none"> • Housing: Painted zinc alloy • Actuator: Stainless steel 			
Weight	1400 g (3.08 lb)			
Color	Red			

(1) The safety contacts are described as normally closed (N.C.) that is, 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-M3NBBDH-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 10](#).

(2) With an 8-pin micro (M12) connector, not all contacts are connected. See [Typical Wiring Diagrams on page 21](#) for wiring details.

Table 9 - Connection Systems

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

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

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





(3) Replace z with OM3 (0.3 m [1 ft]), OM6 (0.6 m [2 ft]), 1 (1 m [3.3 ft]), 2 (2 m [6.6 ft]) or 3 (3 m [9.8 ft]) for standard lengths.

Table 10 - 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

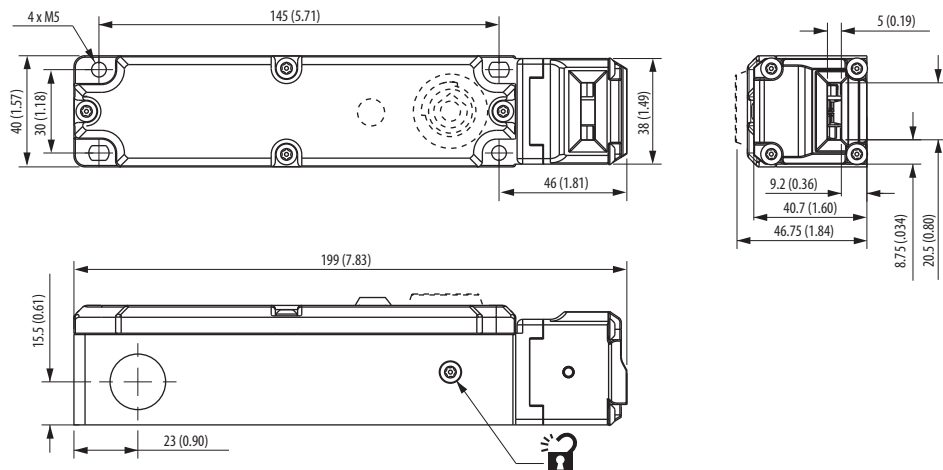
Description	Cat. No.	
 Extended flat actuator	440K-A17116	
	Replacement cover, no status indicator, no override key	440G-MT47120
	Replacement cover, status indicator, override key	440G-MT47123
	Emergency override key (See following Attention)	440G-A36026
	Dust cover	440K-A17180



ATTENTION: 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.



Typical Wiring Diagrams

Description	2 N.C. & 2 N.O.	3 N.C. & 1 N.O.	
Contact Configuration			
Contact Action □ Open ■ Closed			
8-pin Micro (M12)	—		
12-pin m23 QD 	1 and 3 4 and 6 7 and 8 2 and 5 9 and 10 12	Solenoid power Safety A Safety B Safety C Aux A Ground	
8-pin Cordset 889D-F8AB-x ⁽¹⁾	Brown Blue Gray Red Yellow Pink White Green	— — — —	Solenoid power Safety A Safety B Aux A
12-pin Cordset 889M-F12AH-x ⁽¹⁾ Gray/pink not connected.	Brown Gray Pink Yellow White Red/Blue Blue Red Black Violet Green	Solenoid Power Safety A Safety B Aux A Aux B Ground	Solenoid Power Safety A Safety B Safety C Aux A Ground

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

Table 11 - Diagnostic Version

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

Table 12 - Diagnostic Electrical Output

Actuator	Voltage
In	0V DC
Out	+24V DC

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

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 F_{zh} (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	See publication SAFETY-SR001	
Certifications	cULus Listed, TÜV Certified, and CE Marked for all applicable directives rok.auto/certifications	
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>I_{th}</i>	10 A	
Rated insulation voltage (U _i)	500V	
Switching current @ voltage, min	3 mA @ 18V DC	
Utilization Category		
AC-15 (U _e)	240V	120V
AC-15 (I _e)	1.5 A	3 A
DC-13 (U _e)	24V	
DC-13 (I _e)	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 (11.8 in.) end entry, 800 mm (31.5 in.) front entry	
Mechanical life	1,000,000 operations	
Environmental		
Enclosure type rating	IP65	
Operating temperature	-10...+60 °C (14...140 °F)	
Physical Characteristics		
Material	<ul style="list-style-type: none"> • Housing: Die-cast alloy • Actuator: Stainless steel 	
Weight	1200 g (2.65 lb)	
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](#) for details.

Table 13 - 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 [6.6 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 [3.3 ft]), 2 (2 m [6.6 ft]), 3 (3 m [9.8 ft]), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) for standard cable lengths.

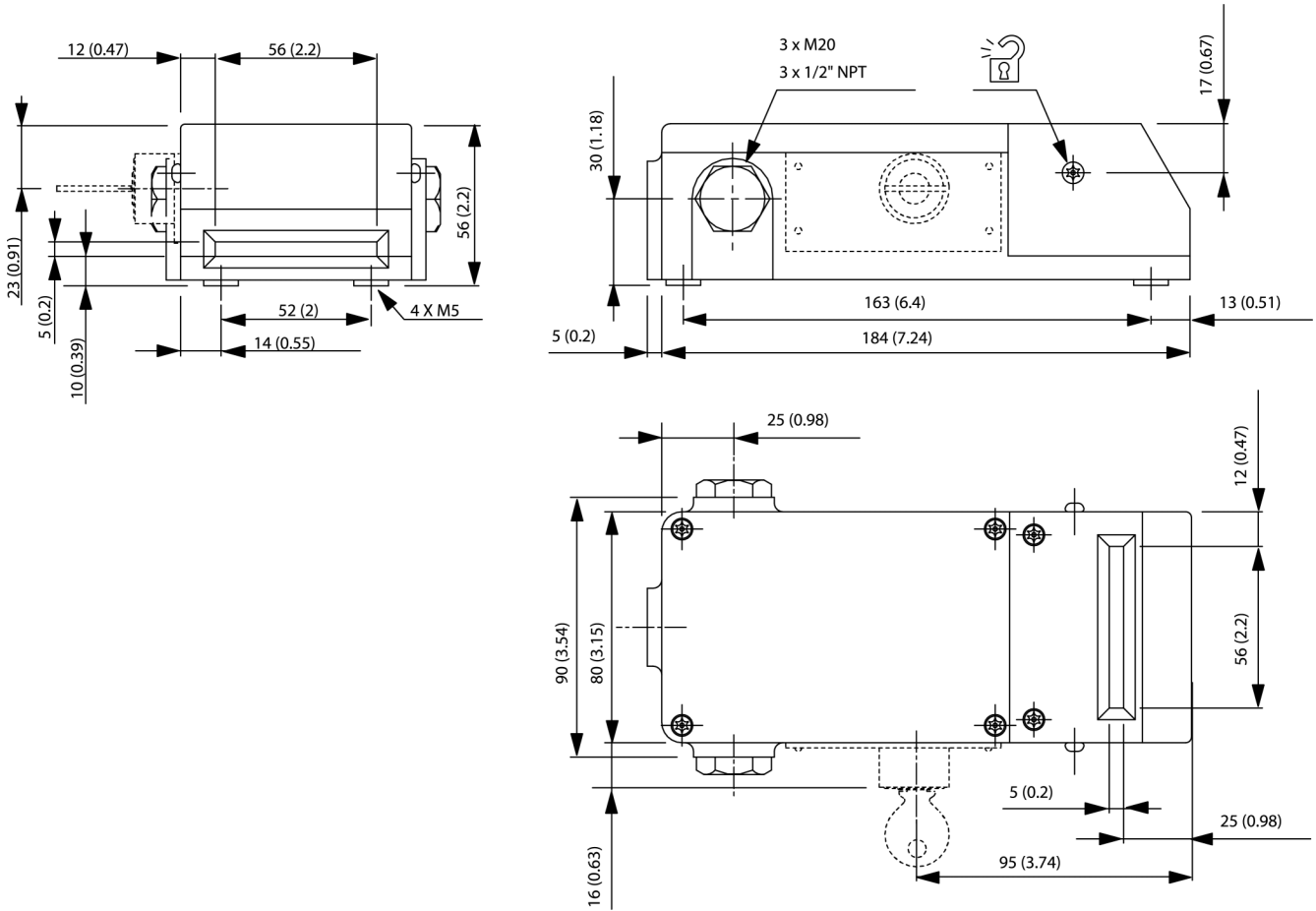
(3) Replace z with 0M3 (0.3 m [1 ft]), 0M6 (0.6 m [2 ft]), 1 (1 m [3.3 ft]), 2 (2 m [6.6 ft]), or 3 (3 m [9.8 ft]) for standard lengths.

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

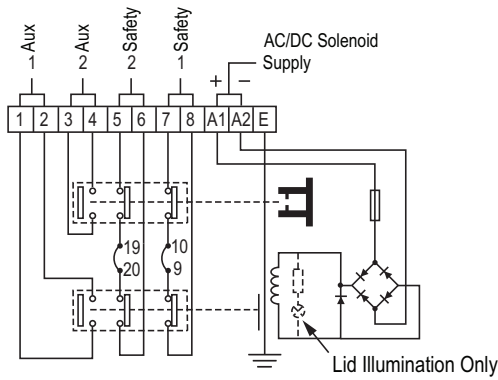
Dimensions are shown in mm (in.). Dimensions are not intended to be used for installation purposes.



Typical Wiring Diagrams

Figure 7 - Contact Configuration

Guard Open—Solenoid De-energized



Terminal Configuration Machine in Run Condition

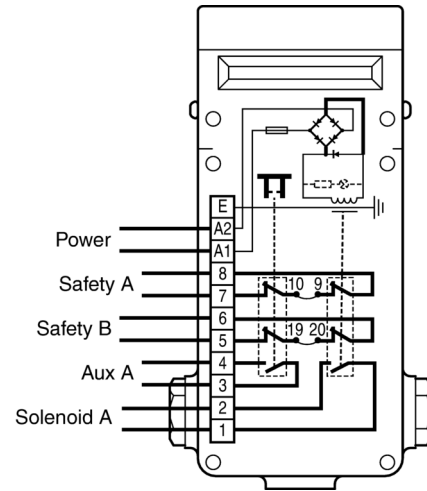
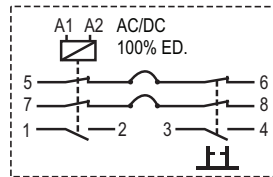


Figure 8 - Contact Action

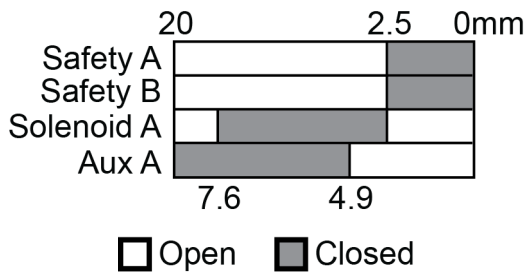


Table 14 - 8-pin (M12) Cordset

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	Gray/Red	Safety A
	6	Yellow/Pink	Safety B
	7	Brown/Blue	Power
	8	Gray/Red	Safety A

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

Table 15 - 12-pin (M23) Cordset

889M-F12AH-x ⁽¹⁾	Pin	Color	Function
	1	Solenoid Power	Brown/Gray
	2	Auxiliary A	Blue/Red
	3	Solenoid Power	Brown/Gray
	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 [6.6 ft]), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) for standard cable lengths.

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: Four possible key entry slots
- A catch kit with actuator alignment helps protect 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 if an unforeseen and uncommon circumstance occurs, 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	See publication SAFETY-SR001
Certifications	cULus Listed, TÜV Certified, and CE Marked for all applicable directives rok.auto/certifications
Outputs	
Safety contacts	2 N.C. or 3 N.C. direct opening action
Auxiliary contacts	1 N.O.
Thermal current (I_{th})	10 A
Insulation voltage	500V
Impulse withstand voltage	2500V
Utilization Category	AC 15
AC (Ue)	500V 250V 100V
(Ie)	1 A 2 A 5 A
DC	250V/0.5 A 24V/2 A
Switched current/volt/load, max	500V/500VA
Current, min	5V 5 mA DC
Safety contact gap	>2 mm (0.08 in.)
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 7 W 100% ED

Attribute	Value
Operating Characteristics	
Actuation speed, max	160 mm (6.3 in.) per second
Actuation frequency, max	1 cycle per second
Mechanical life	1,000,000 operations
Environmental	
Pollution degree ⁽¹⁾	3
Operating temperature	-20...+60 °C (-4...+140 °F)
Protection	IP67
Physical Characteristics	
Material	<ul style="list-style-type: none"> • Housing: UL Approved glass filled polyester • Actuator: 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
Operating radius, min	175 mm (6.9 in.)
Status indicator	Solenoid monitor



(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. Adapter	Quick Disconnect
Standard	24V AC/DC	2 N.C.	1 N.O.	440G-S36001	440G-S36044	440G-S36058
		3 N.C.	–	440G-S36007	440G-S36047	40G-S36059
	110V 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⁾

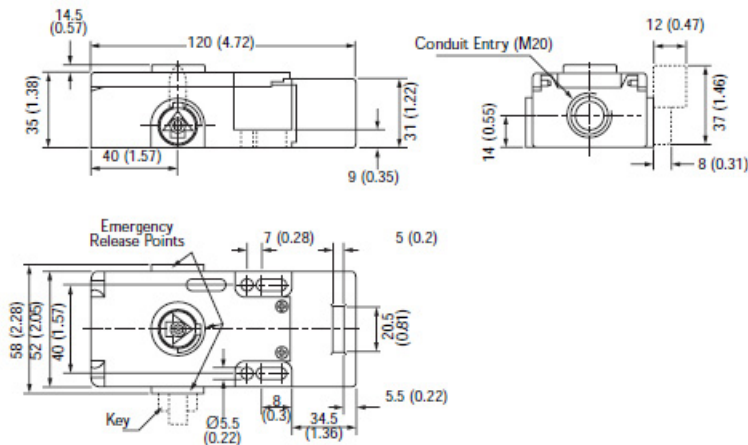
(1) Replace x with 2 (2 m [6.6 ft]), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) for standard cable lengths.

Accessories

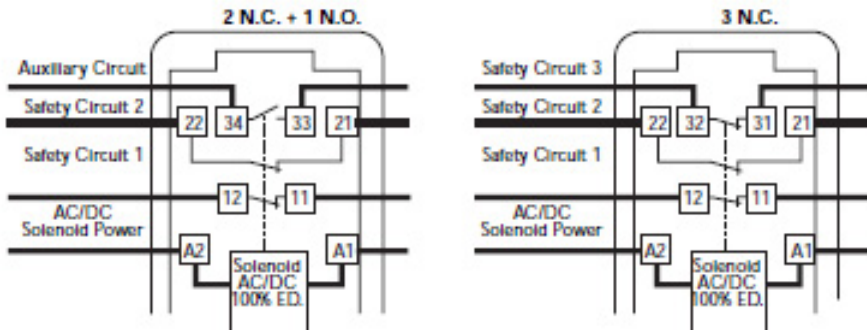
Description	Cat. No.
 Replacement actuator with catch retainer and guide	440G-A36050
 Manual release key	440G-A36026

Approximate Dimensions

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



Typical Wiring Diagrams

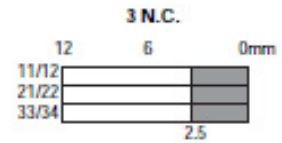
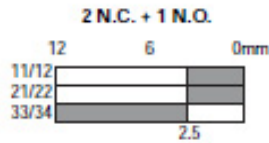


Connector Pinout	2 N.C. + 1 N.O.		3 N.C.	
	Terminal	Contact	Terminal	Contact
1	A1	Solenoid	A1	Solenoid
3	A2	Power	A2	Power
4	11	N.C.	11	N.C.
6	12	N.C.	12	N.C.
7	21	N.C.	21	N.C.
8	22	N.C.	22	N.C.
9	33	N.O.	31	N.C.
19	34	N.O.	32	N.C.

Contact Action

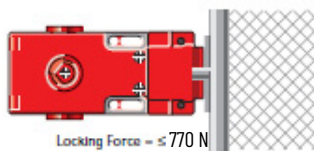
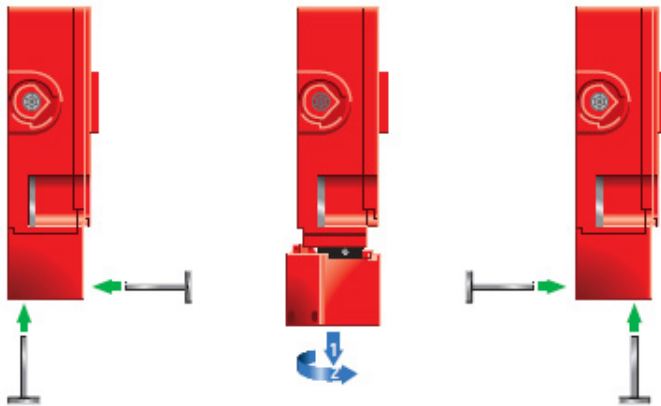
☐ Contact Open ■ Contact Closed

Actuator withdrawal distance from full insertion



Application Details

Four possible actuator entry positions



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 (2.95 x 0.98 in.) 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 14119, 60947-5-1			
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 Level PL _e or PL _d systems (according to ISO 13849-1) and for use in SIL 2 or SIL 3 systems (according to IEC 62061) depending on the architecture and application characteristics			
Certifications	CE Marked for all applicable directives, cULus, NRTL/C, and TÜV rok.auto/certifications			
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	—	—	—

Attribute	Value
Outputs	
Safety contacts ⁽²⁾	2 N.C. direct opening action 1 N.C. direct opening action
Auxiliary contacts	— 1 N.O.
Shaft rotation for contact operation	11° max, 3° min (adjustable)
Thermal current/ <i>I_{th}</i>	10 A
Rated Insulation voltage <i>U_i</i>	500V
Switching current @ voltage, min	3 mA @ 18V DC
Environmental	
Enclosure type rating	IP67
Operating temperature	-20...+80 °C (-4...+176 °F)
General	
Material	<ul style="list-style-type: none"> • Housing: UL-approved glass-filled PBT • Actuator: 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/10min, 24hr/day, 360 days/year, which represents 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 17](#).

Table 16 - Connection Systems

Description	Cat. No.		
	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 [6.6 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 [3.3 ft]), 2 (2 m [6.6 ft]), 3 (3 m [9.8 ft]), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) for standard cable lengths.

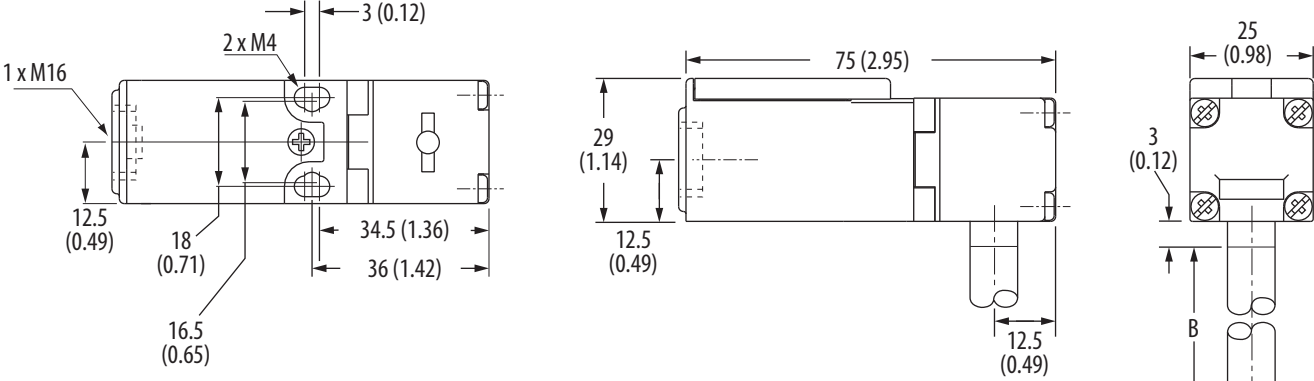
(3) Replace z with 4 or 8 for number of ports.

Table 17 - 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

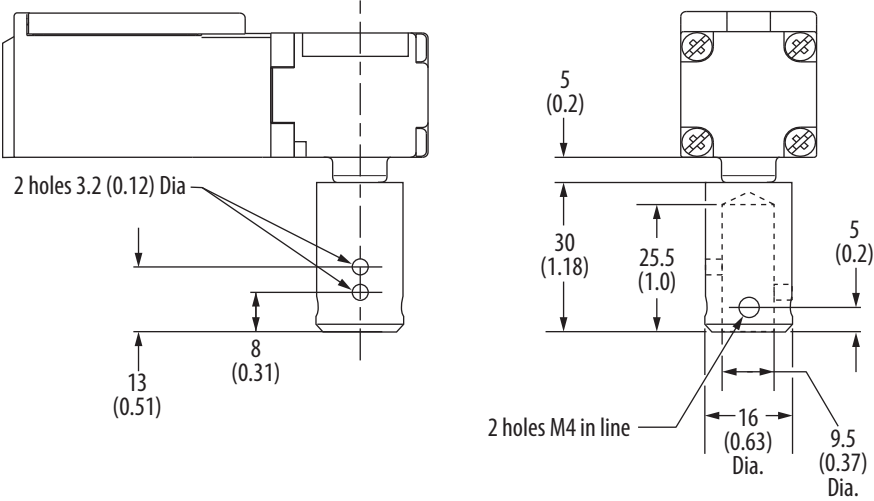
Approximate Dimensions

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 9 - Contact Configuration

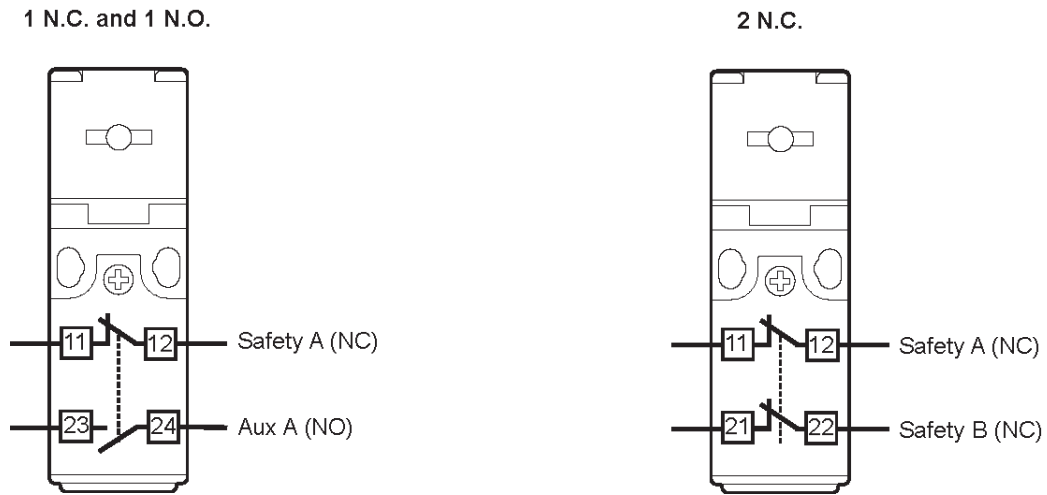


Figure 10 - Contact Action



Figure 11 - 4-pin Micro (M12)

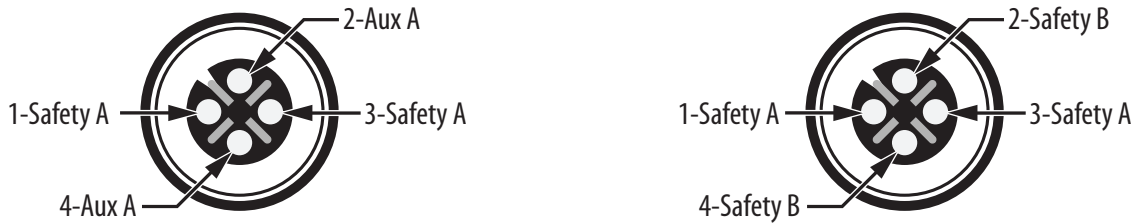


Table 18 - Cordset 889D-F4AC-x ⁽¹⁾

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 [6.6 ft]), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) 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 14119, 60947-5-1			
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 Level PL _e or PL _d systems (according to ISO 13849-1) and for use in SIL 2 or SIL 3 systems (according to IEC 62061) depending on the architecture and application characteristics			
Certifications	CE Marked for all applicable directives, cULus, NRTL/C, and TÜV rok.auto/certifications			
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⁾	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>	10 A			
Rated Insulation voltage U _i	500V			
Switching current @ voltage, min	3 mA @ 18V DC			
Environmental				
Enclosure type rating	IP67			
Operating temperature	-20...+80 °C (-4...+176 °F)			
General				
Material	<ul style="list-style-type: none"> • Housing: UL-approved glass-filled PBT • Actuator: 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/10min, 24hr/day, 360 days/year, which represents 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 17](#).

(2) With an 8-pin micro connector, not all contacts are connected. See [Typical Wiring Diagrams on page 36](#) for wiring details.

Table 19 - Connection Systems

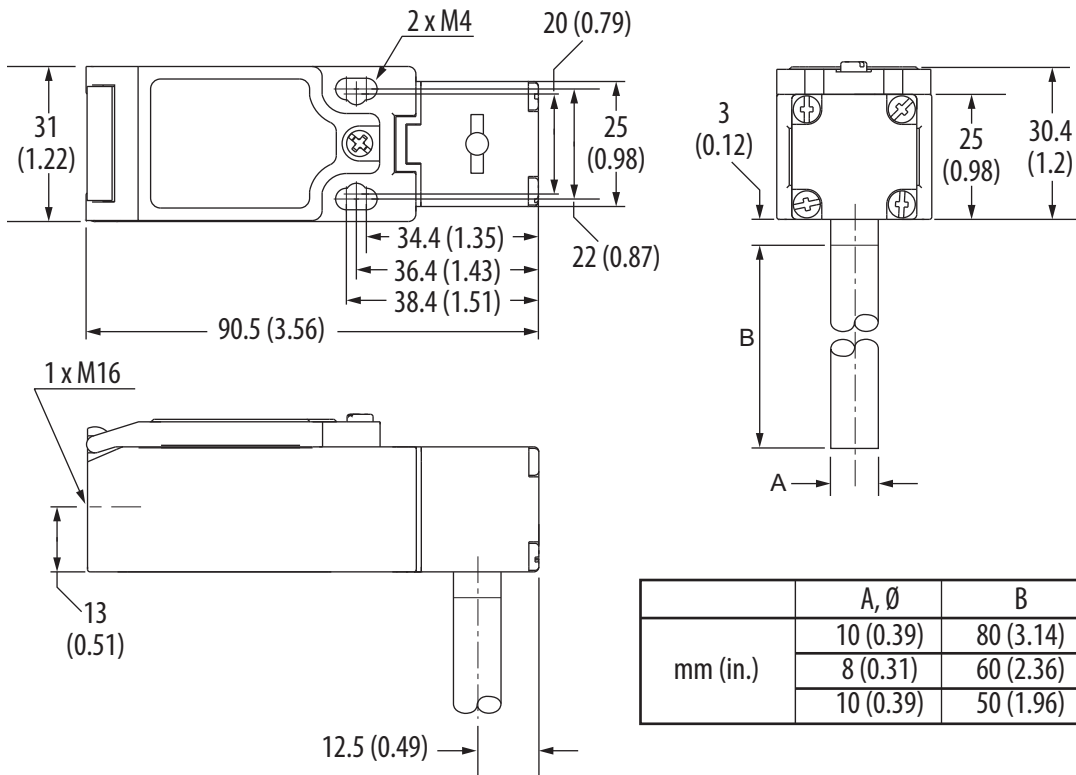
Description	Cat. No.	
	6-pin Micro (M12)	5-pin Micro (M12) for ArmorBlock Guard I/O
	3 N.C.-2 N.C. & 1 N.O	3 N.C.
Cordset	889R-F6ECA-x ⁽¹⁾	-
Patchcord	889R-F6ECRM-y ⁽²⁾	889D-F5ACDM-x ⁽¹⁾
Distribution box	898R-P68MT-A5	-
Shorting plug	898R-P61MU-RM	-

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

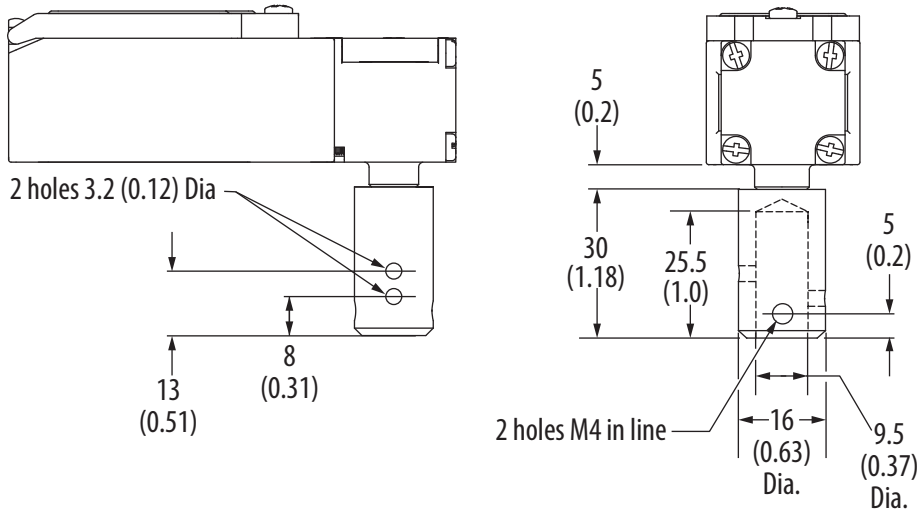
(2) Replace y with 1 (1 m [3.3 ft]), 2 (2 m [6.6 ft]), 3 (3 m [9.8 ft]), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) for standard cable lengths.

Approximate Dimensions

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



Hollow Shaft



Typical Wiring Diagrams

Figure 12 - Contact Configuration

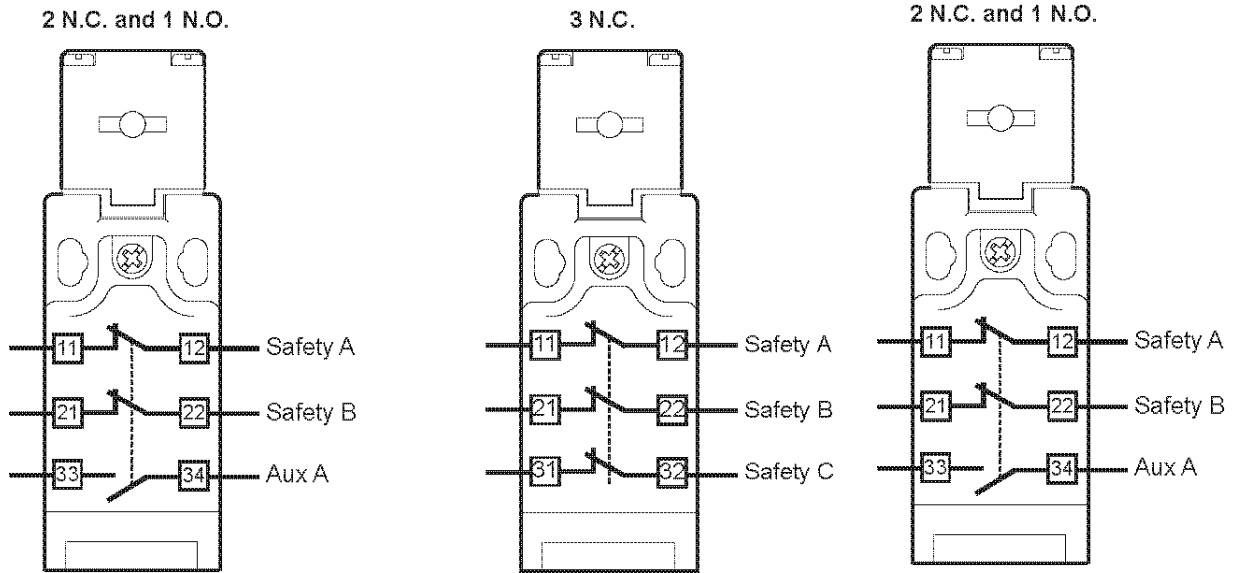
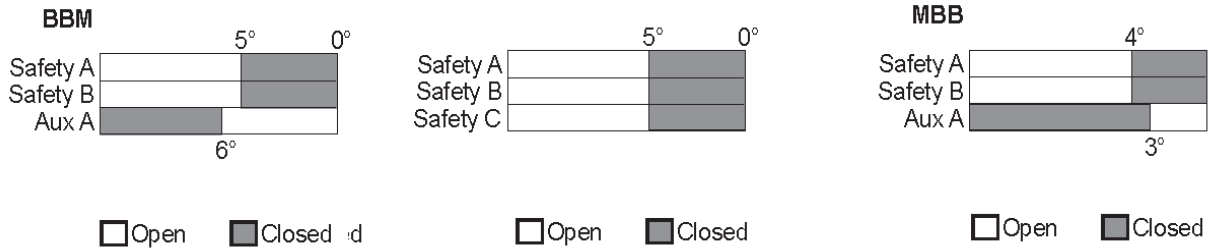
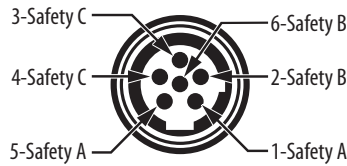
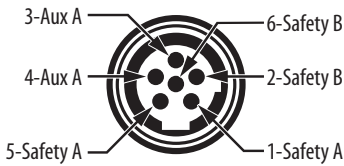


Figure 13 - Contact Action



6-pin Micro (M12)



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

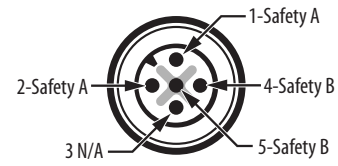


Table 20 - Cordset 889R-F5ECA-x⁽¹⁾ or Cordset 889R-F6ECA-x⁽¹⁾ Cordset 889D-F4AC-x⁽¹⁾

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 A
3	Green	Aux A	—
4	Red/Yellow	Aux A	Safety B
5	Red/Black	Safety A	Safety B
6	Red/Blue	Safety B	—

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

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

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. and 1 N.O.



Specifications

Attribute	Value			
Safety Ratings				
Standards	ISO 14119, 60947-5-1			
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 Level PLe or PLd systems (according to ISO 13849-1) and for use in SIL 2 or SIL 3 systems (according to IEC 62061) depending on the architecture and application characteristics			
Certifications	CE Marked for all applicable directives, cULus, SUVA, and TÜV rok.auto/certifications			
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			
Auxiliary contacts	1 N.O.			
Shaft rotation for contact operation	11° max, 5° min (adjustable)			
Thermal current / I _{th}	10 A			
Rated Insulation voltage Ui	500V			
Switching current @ voltage, min	3 mA @ 18V DC			
Environmental				
Enclosure type rating	IP66			
Operating temperature	-20...+80 °C (-4...+176 °F)			
General				
Material	<ul style="list-style-type: none"> • Housing: Heavy-duty die-cast alloy • Actuator: 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/10min, 24hr/day, 360 days/year, which represents 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 21 - 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 17](#).

Table 22 - Connection Systems

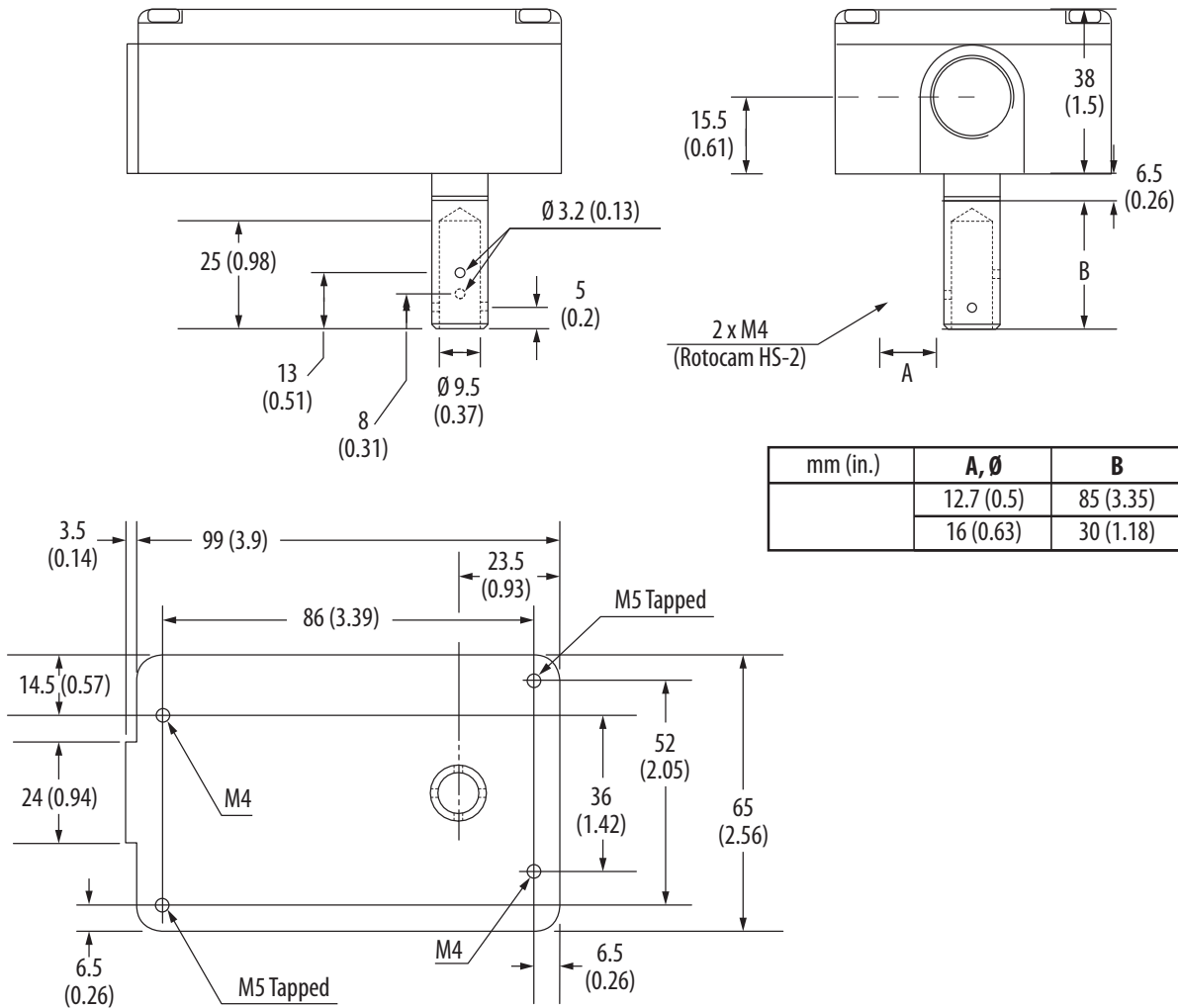
Description	Cat. No.
Cordset	889D-F8AB-x ⁽¹⁾
Patchcord	889D-F8ABDM-y ⁽²⁾

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

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

Approximate Dimensions

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



Typical Wiring Diagrams

Figure 14 - Contact Configuration
2 N.C. and 1 N.O.

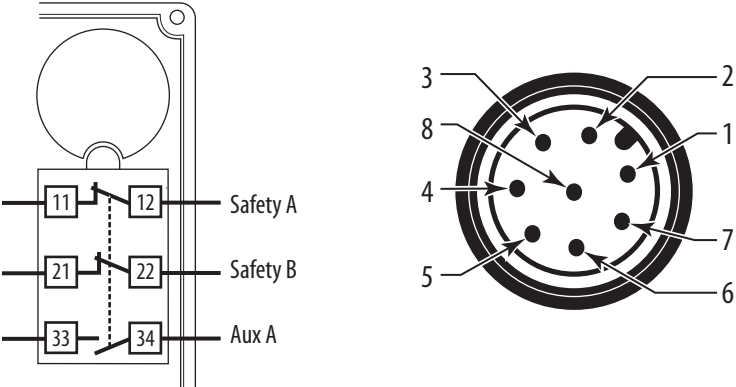


Table 23 - 8-pin (M12) Cordset 889D-F8AB-x⁽¹⁾

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

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

Notes:

Interlocking Switches with Guard Locking for Process Protection

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 monitoring)
- 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 (0.2 in.) in all directions
- Reduced accumulation of scrap



Specifications

Attribute	440G-EZS21STL05J, 440G-EZS21STL05H, 440G-EMAS
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 category 4 per ISO 13849-1 and SIL 3 per IEC 62061
Functional Safety Data (door position monitoring)	PFHd: 1.5 x 10 ⁻⁸ (EN ISO 13849). Mission time/PTI: 20 years
Certifications	CE marked for all applicable EU directives, cULus (UL508), TÜV, C-Tick rok.auto/certifications
Operating Characteristics	
Safe switch on distance	4 mm (0.16 in.)
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
Actuation frequency, max	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	32V
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
Output current, max	≤100 mA

Attribute	440G-EZS21STL05J, 440G-EZS21STL05H, 440G-EMAS
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
Physical Characteristics	
Material	<ul style="list-style-type: none"> • Sensor: Anodized aluminum • Actuator: Fiberglass-reinforced PVC • Anchor plate: Nickel-plated steel
Weight	<ul style="list-style-type: none"> • Sensor: 510 g (18 oz) • Actuator: 210 g (7.4 oz)

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

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

Figure 15 - Actuator

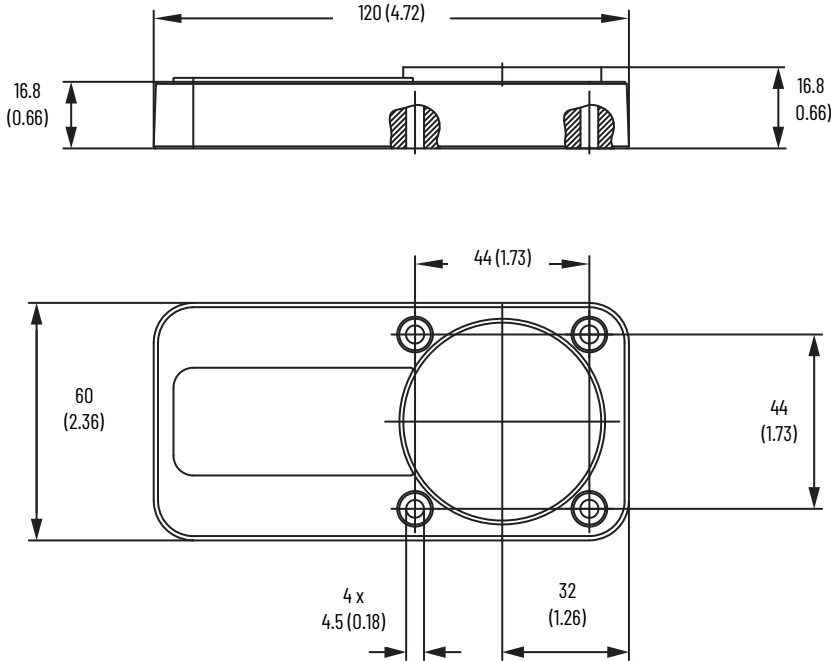
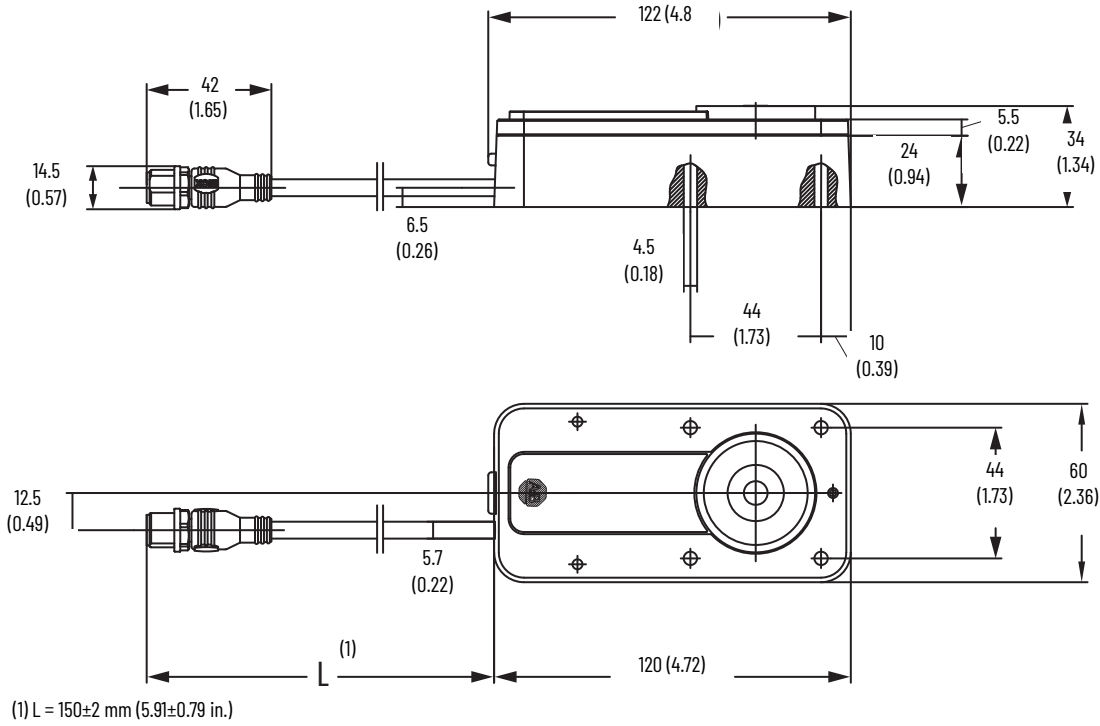
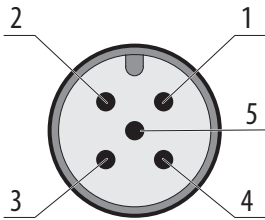


Figure 16 - Sensor



Typical Wiring Diagrams

Figure 17 - Device Connection Pin Assignment (Male Connector, M12, 5-pin, A-coded)

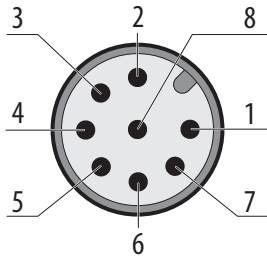


Pin	Wire Color ⁽¹⁾	Designation	Description
1	Brown	+24V DC	Safety switch voltage supply
2	White	OSSD 1	OSSD 1 output
3	Blue	0V	0V DC voltage supply
4	Black	OSSD 2	OSSD 2 output
5	Gray	Magnet	Magnet activation 24V DC

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

IMPORTANT Pay attention to tightness of the plug connector.

Figure 18 - 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.

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 overvoltage protection
- Status indicator on the switch for door status and troubleshooting
- Unique coded version
 - Automatic learn process at unit powerup
 - During commissioning, you can select if the sensor can learn a new actuator up to eight times or lock the unit so it cannot 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, IEC 62061
Safety classification	Type 4 Interlocking Device per ISO 14119 (Unique/High and Standard/Low Coding), PLe category 4 per ISO 13849-1
Functional safety data	See publication SAFETY-SR001
Certifications	cULus (UL 508), TÜV Certified, and CE Marked for all applicable directives rok.auto/certifications
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	
Assured sensing distance	<ul style="list-style-type: none"> • 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/standard target: 15 mm (0.59 in.)
Misalignment tolerance, min	See Magnetically Coded Non-contact Interlock Switches on page 50
Repeat accuracy	10% of Sensing Range
Output current, max	200 mA (all outputs)
Operating voltage	24V DC, +10%/–15%; Class 2

Attribute	Value
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	
Material	<ul style="list-style-type: none"> • Housing: VALOX DR 48 • Actuator: VALOX DR 48
Color	Red

Product Selection

Type	Assured Sensing Distance [mm (in.)]	Light-emitting Diode (LED) Door Indication/Diagnostic	Margin Indication	Magnetic Hold	Actuator Code Type	Cat. No.			
						Cable		Connector	
						3 m (9.8 ft)	10 m (32.8 ft)	6 in. (152.4 in.) Pigtail, 8-pin Micro (M12)	6 in. (152.4 in.) Pigtail, 5-pin Micro (M12)
18 mm plastic barrel/ 18 mm actuator	15 (0.59)	Yes	—	—	Standard	440N-Z21S16A	440N-Z21S16B	440N-Z21S16H	440N-Z21S16J
					Unique	440N-Z21U16A	440N-Z21U16B	440N-Z21U16H	440N-Z21U16J
18 mm plastic barrel/ 30 mm actuator	25 (0.98)	Yes	—	—	Standard	440N-Z21S26A	440N-Z21S26B	440N-Z21S26H	440N-Z21S26J
					Unique	440N-Z21U26A	440N-Z21U26B	440N-Z21U26H	440N-Z21U26J
18 mm stainless steel barrel/ 18 mm stainless steel actuator	10 (0.39)	Yes	—	—	Standard	440N-Z21S17A	440N-Z21S17B	440N-Z21S17H	440N-Z21S17J
					Unique	440N-Z21U17A	440N-Z21U17B	440N-Z21U17H	440N-Z21U17J
Plastic rectangular/ rectangular actuator	15 (0.59)	Yes	—	—	Standard	440N-Z21SS2A	440N-Z21SS2B	440N-Z21SS2H	440N-Z21SS2J
					Unique	440N-Z21US2A	440N-Z21US2B	440N-Z21US2H	440N-Z21US2J
			Yes	—	Standard	440N-Z21SS2AN	440N-Z21SS2BN	440N-Z21SS2HN	440N-Z21SS2JN
					Unique	440N-Z21US2AN	440N-Z21US2BN	440N-Z21US2HN	440N-Z21US2JN
			Yes	Yes (9 N)	Standard	440N-Z21SS2AN9	440N-Z21SS2BN9	440N-Z21SS2HN9	440N-Z21SS2JN9
					Unique	440N-Z21US2AN9	440N-Z21US2BN9	440N-Z21US2HN9	440N-Z21US2JN9
Plastic housing with integrated latch	Contact/ latched	Yes	—	Adjustable 20...60 N	Standard	440N-Z21SS3PA	440N-Z21SS3PB	440N-Z21SS3PH	440N-Z21SS3PJ
					Unique	440N-Z21SU3PA	440N-Z21SU3PB	440N-Z21SU3PH	440N-Z21SU3PJ

Table 24 - Connection Systems

Description		Cat. No.
Cordset	5-pin	889D-F5AC-x ⁽¹⁾
	8-pin	889D-F8AB-x ⁽¹⁾
Patchcord	4-pin	889D-F4ACDM-y ⁽²⁾
	5-pin	889D-F5ACDM-y ⁽²⁾
	8-pin	889D-F8ABDM-y ⁽²⁾
Safety wired t-port		898D-438Y-D8
Safety wired shorting plug		898D-418U-DM
Safety wired shorting plug, 4-pin		898D-41KU-DM

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

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

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

Description		To Be Used With	Cat. No.
	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-ZUPRECMB
		Standard coded margin indication models	440N-ZPRECM1B
	Mounting bracket for tubular proximity sensors—right angle style	18 mm barrel models	871A-BRS18
			871A-BP18
	Mounting bracket for tubular sensors—clamp style	18 mm barrel models	871A-SCBP18
			60-2649
	Snap clamp mounting bracket	18 mm barrel models	440N-AHDB
	18 mm mounting bracket		440N-ASDB
	Mounting plate for vertically hinged doors	Integrated latch version only	871A-BRS18
	Mounting plate for slide and gull wing doors		
	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 19 - 18 mm Barrel

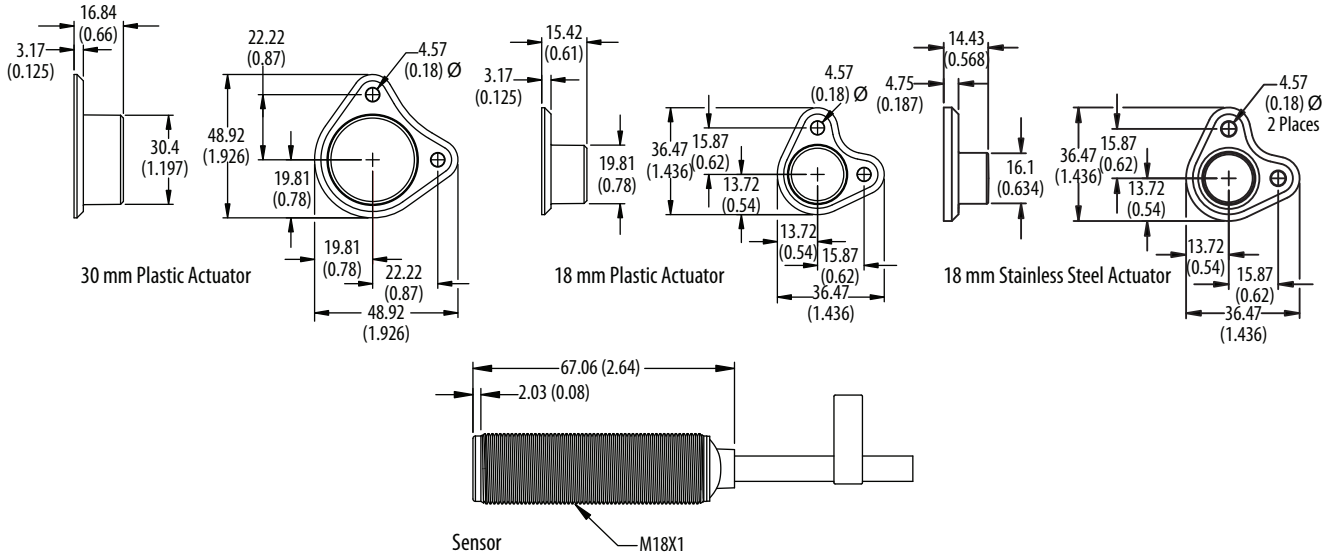


Figure 20 - Large Rectangular Flat Pack

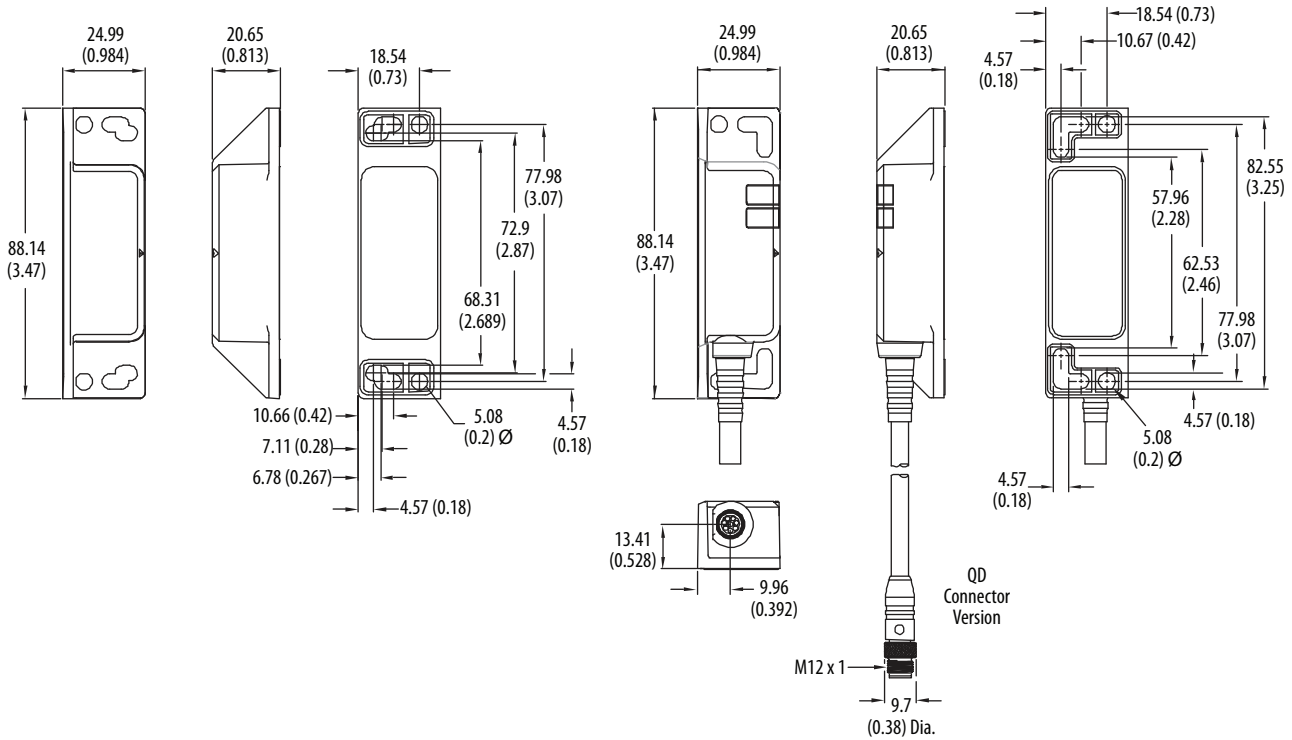
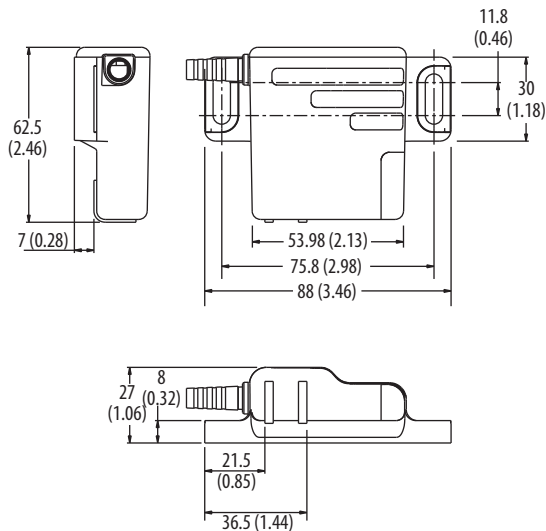


Figure 21 - Integrated Latch



Typical Wiring Diagrams

Table 25 - 8-pin Micro (M12)

Description		Plastic	Stainless Steel
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 [6.6 ft]), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) for standard cable lengths.

Table 26 - 5-pin Micro (M12)



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

Magnetically Coded Non-contact Interlock Switches

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

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



Specifications

Attribute	Value
Safety Ratings	
Standards	ISO 14119, IEC 60947-5-3, ISO 13849-1, IEC 62061
Safety classification	Type 4 Interlocking Device with low coding per ISO 14119
Functional safety data	See publication SAFETY-SR001
Certifications	cULus Listed, TÜV Certified, and CE Marked for all applicable directives rok.auto/certifications
Outputs (Guard Door Closed, Actuator in Place)	
Safety outputs	<ul style="list-style-type: none"> • MC1: 2 N.C. REEDS • MC2: 2 N.C. solid-state relays
Auxiliary outputs	<ul style="list-style-type: none"> • MC1: – • MC2: 1 x PNP, 0.2 A max; Status: OFF (OV DC)
Operating Characteristics	
Operating distance, make	<ul style="list-style-type: none"> • MC1: 8 mm (0.3 in.) • MC2: 10 mm (0.39 in.)
Operating distance, break	<ul style="list-style-type: none"> • MC1: 15 mm (0.59 in.) • MC2: 25 mm (0.98 in.)
Repeat accuracy	10% of sensing range
Output current, max	200 mA
Switching current @ voltage	<ul style="list-style-type: none"> • MC1: 24V DC @ 200 mA, max • MC2: 24V DC @ 200 mA +10%/-15%, max
Operating voltage/power supply	<ul style="list-style-type: none"> • MC1: – • MC2: 24V DC, +10%/-15%/50 mA max/Class 2 SELV
Frequency of operating cycle	1 Hz
Environmental	
Enclosure type rating	MC1: IP67 (NEMA 6P) MC2: 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	
Material	MC1 <ul style="list-style-type: none"> • Housing: Molded ABS • Actuator: Molded ABS MC2 <ul style="list-style-type: none"> • Housing: Ultrador • Actuator: 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 (9.8 ft) cable	440N-Z2NRS1A
					10 m (32.8 ft) 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 (9.8 ft) cable	440N-Z21W1PA
					10 m (32.8 ft) cable	440N-Z21W1PB

Table 27 - Connection Systems

Description	Cat. No.	
	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 [6.6 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 [3.3 ft]), 2 (2 m [6.6 ft]), 3 (3 m [9.8 ft]), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) for standard cable lengths.

(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 22 - MC1

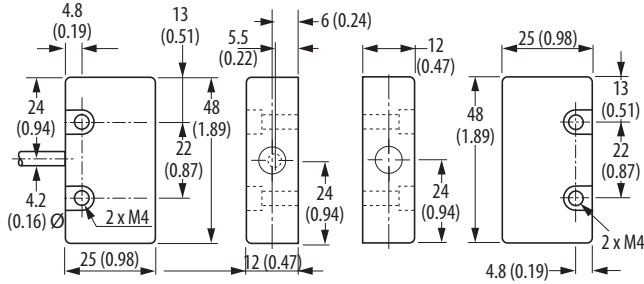
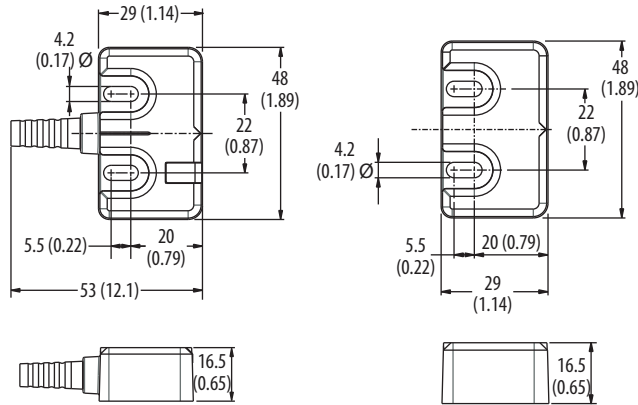


Figure 23 - MC2



Typical Wiring Diagrams

Description		MC1 – 2 N.C.	MC2 – 2 N.C. and 1 N.O.
4-pin Micro (M12)			–
8-pin Micro (M12)		–	
Cordset 889D-F4AC-x or Cable Version ⁽¹⁾	Brown	Safety A	–
	Blue		
	White	Safety B	
	Black		
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 [6.6 ft]), 5 (5 m [16.4 ft]) or 10 (10 m [32.8 ft]) for standard cable lengths.

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	ISO 14119, IEC 60947-5-3, ISO 13849-1, IEC 62061
Safety classification	Cat. 1 Device per ISO13849-1. Dual channel interlocks suitable for Cat. 3 or 4 systems
Functional safety data For up-to-date information, visit ab.rockwellautomation.com/safety	BT0d: > 2 x 10 ⁶ operations Dual channel interlock may be suitable for Performance Level PLe or PLD (according to ISO 13849-1) and for use in SIL 2 or SIL 3 systems (according to IEC 62061) depending on application characteristics
Certifications	CE Marked for all applicable directives rok.auto/certifications
Outputs (Guard Door Closed, Actuator in Place)	
Safety outputs	<ul style="list-style-type: none"> • FRS1: 1 N.C. • FRS2: 1 N.C. • FRS20: 2 N.C. • FRS21: 2 N.C.
Auxiliary outputs	<ul style="list-style-type: none"> • FRS1: None • FRS2: 1 N.O. • FRS20: None • FRS21: 1 N.O.
Operating Characteristics	
Operating distance, make	<ul style="list-style-type: none"> • Safety: 12 mm (0.47 in.) • Auxiliary: 15 mm (0.59 in.)
Operating distance, break	<ul style="list-style-type: none"> • Safety: 23 mm (0.91 in.) • Auxiliary: 26 mm (1.02 in.)
Fuses, external	<ul style="list-style-type: none"> • 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	
Material	<ul style="list-style-type: none"> • Housing: Molded ABS plastic • Actuator: Molded ABS plastic
Weight	FRS 1 <ul style="list-style-type: none"> • Sensor: 35 g (0.08 lb) • Actuator: 85 g (0.19 lb) FRS 2 <ul style="list-style-type: none"> • Sensor: 40 g (0.09 lb) • Actuator: 85 g (0.19 lb) FRS 20 <ul style="list-style-type: none"> • Sensor: 43 g (0.09 lb) • Actuator: 85 g (0.19 lb) FRS 21 <ul style="list-style-type: none"> • Sensor: 43 g (0.09 lb) • Actuator: 85 g (0.19 lb)
Color	Red

Product Selection

Switching Capability	Safety Contacts ⁽¹⁾	Auxiliary Contacts ⁽¹⁾	Connection	Type	Cat. No.		
250V AC, 2 A max	1 N.C.	—	2 m (6.6 ft) cable	FRS 1	440N-G02001		
			4 m (13.1 ft) cable		440N-G02004		
			6 m (19.7 ft) cable		440N-G02022		
			8 m (26.2 ft) cable		440N-G02041		
			10 m (32.8 ft) cable		440N-G02015		
		1 N.O.	2 m (6.6 ft) cable	FRS 2	440N-G02002		
			4 m (13.1 ft) cable		440N-G02014		
			6 m (19.7 ft) cable		440N-G02038		
			8 m (26.2 ft) cable		440N-G02033		
			10 m (32.8 ft) cable		440N-G02019		
	2 N.C.	—	15 m (49.2 ft) cable	FRS 20	440N-G02043		
			20 m (65.6 ft) cable		440N-G02040		
			4-pin Micro QD		440N-G02093		
	2 N.C.	1 N.O.	4-pin Micro QD	FRS 21	440N-G02097		
			2 m (6.6 ft) cable		440N-G02055		
			4 m (13.1 ft) cable		440N-G02061		
			6 m (19.7 ft) cable		440N-G02060		
			10 m (32.8 ft) cable		440N-G02059		
24V DC, 1 A	1 N.C.	1 N.O.	6-pin AC Micro QD ⁽²⁾	FRS 2	440N-G02098		
			2 m (6.6 ft) cable		440N-G02092		
	2 N.C.	—	—	4-pin Micro QD	FRS 20	440N-G02094	
				4 m (13.1 ft) cable		440N-G02085	
				4-pin Micro QD		440N-G02090	
				4 m (13.1 ft) cable		440N-G02058	
		1 N.O.	1 N.O.	1 N.O.	6 m (19.7 ft) cable	FRS 21	440N-G02077
					2 m (6.6 ft) cable		440N-G02083
					4 m (13.1 ft) 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, see [Table 29](#).

Table 28 - Connection Systems

Description	Cat. No.	
	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-4IKU-DM	898R-P61MU-RM
T-port	898D-43KY-D4	—

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

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

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

Table 29 - Connector Ratings

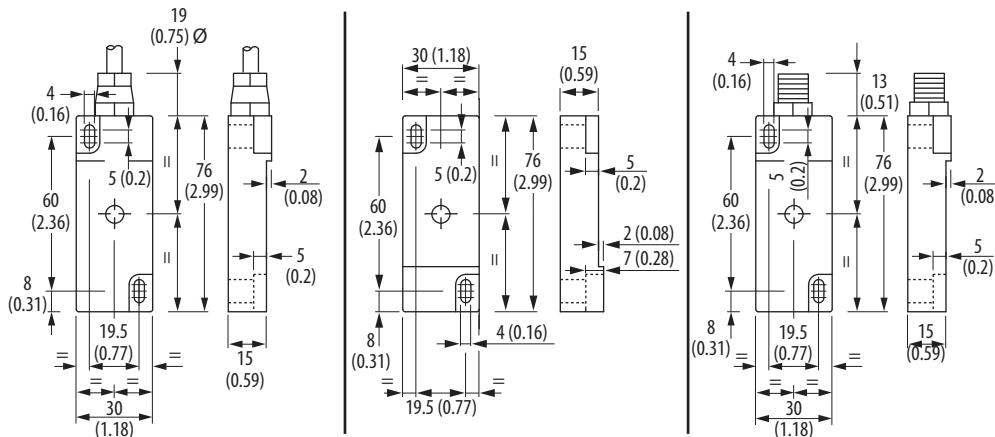
Description	Max Ratings		Applicable Standards
	AC	DC	
4-pin Micro (M12)	250V, 4 A	250V, 4 A	IEC 61076-2-101:2003
5-pin Micro (M12)	60V, 4 A	60V, 4 A	IEC 61076-2-101:2003
6-pin Micro (M12)	30V, 2 A	30V, 2 A	IEC 61076-2-101:2003
8-pin Micro (M12)	30V, 2 A	30V, 2 A	IEC 61076-2-101:2003
12-pin M23	63V, 6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

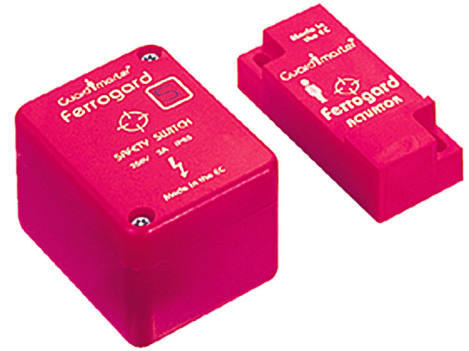
Description		FRS1 1 N.C.	FRS2 1 N.C. + 1 N.O.	FRS20 2 N.C.	FRS21 2 N.C. + 1 N.O.
4-pin Micro (M12)		—			—
6-pin Micro (M12)		—	—	—	
Cordset 889D-F4AC-x or Cable Versions ⁽¹⁾	Brown	—	Safety A	Safety A	—
	Blue	—	—	—	—
	Black	—	—	—	—
	White	—	—	—	—
Cordset 889R-F6ECA-x ⁽¹⁾	Red/White	—	—	—	Safety A
	Red/Black	—	—	—	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 [6.6 ft]), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) 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	ISO 14119, IEC 60947-5-3, ISO 13849-1, IEC 62061
Safety classification	Cat. 1 Device per ISO13849-1. Dual-channel interlocks suitable for Cat. 3 or 4 systems
Functional safety data For up-to-date information, visit ab.rockwellautomation.com/safety	B10d: > 2 x 10 ⁶ operations Dual channel interlock may be suitable for Performance Level PLe or PLd (according to ISO 13849-1) and for use in SIL 2 or SIL 3 systems (according to IEC 62061) depending on application characteristics
Certifications	CE Marked for all applicable directives rok.auto/certifications
Outputs (Guard Door Closed, Actuator in Place)	
Safety outputs	<ul style="list-style-type: none"> • FRS3: 1 N.C. • FRS4: 1 N.C. • FRS5: 1 N.C.
Auxiliary outputs	<ul style="list-style-type: none"> • FRS3: 1 N.C. • FRS4: 1 N.O. • FRS5: None
Operating Characteristics	
Operating distance, make [mm (in.)]	Safety/Auxiliary: <ul style="list-style-type: none"> • FRS 3: 12 (0.47) • FRS 4: 12 (0.47) • FRS 5: 12 (0.47)
Operating distance, break [mm (in.)]	Safety/Auxiliary: <ul style="list-style-type: none"> • 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	
Material	<ul style="list-style-type: none"> • Housing: Molded ABS plastic • Actuator: Molded ABS plastic
Color	Red

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

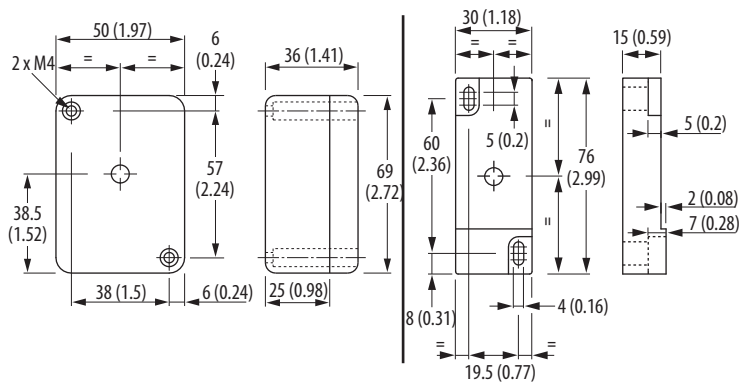
(1) Contacts are described with the guard door closed, that is, actuator in place.

Accessories

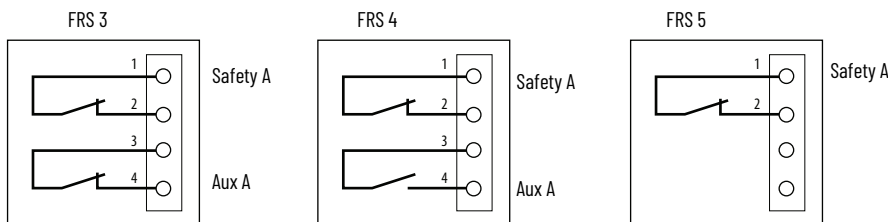
Description	Cat. No.
Replacement actuator	440N-A02005

Approximate Dimensions

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



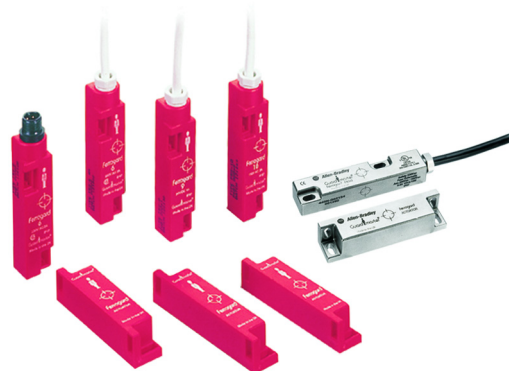
Typical Wiring Diagrams



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	ISO 14119, IEC 60947-5-3, ISO 13849-1, IEC 62061
Safety classification	Cat. 1 Device per ISO13849-1. Dual channel interlocks suitable for Cat. 3 or 4 systems
Functional safety data For up-to-date information, visit ab.rockwellautomation.com/safety	B10d: > 2 x 10 ⁶ operations Dual channel interlock may be suitable for Performance Level PLe or PLd (according to ISO 13849-1) and for use in SIL 2 or SIL 3 systems (according to IEC 62061) depending on application characteristics
Certifications	
FRS6, FRS9, FRS10	CE Marked for all applicable directives rok.auto/certifications
FRS13, FRS14	CE Marked for all applicable directives and cULus rok.auto/certifications
Outputs (Guard Door Closed, Actuator in Place)	
Safety outputs	1 N.C.
Auxiliary outputs	—
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	
Material	<ul style="list-style-type: none"> • Housing: Molded ABS plastic • Actuator: Molded ABS plastic
Weight	<ul style="list-style-type: none"> • Sensor: 28 g (0.06 lb) • Actuator: 70 g (0.15 lb)
Color	Red

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 (6.6 ft) cable	440N-G02023
					4 m (13.1 ft) cable	440N-G02028
					6 m (19.7 ft) cable	440N-G02032
					10 m (32.8 ft) cable	440N-G02013
					4-pin Micro QD	440N-G02095
24V DC, 1 A				FRS 9	2 m (6.6 ft) cable	440N-G02044
					4 m (13.1 ft) cable	440N-G02075
					6 m (19.7 ft) cable	440N-G02082
					10 m (32.8 ft) cable	440N-G02089
					4-pin Micro QD	440N-G02096
110V AC, 3 A	FRS 10	2 m (6.6 ft) cable	440N-G02045			
		4 m (13.1 ft) cable	440N-G02088			
250V AC, 2 A	1 N.C.	Stainless steel	FRS 13	2 m (6.6 ft) cable	440N-G02154	
				4 m (13.1 ft) cable	440N-G02155	
				8-pin Micro QD	440N-G02160	
24V DC, 1 A			FRS 14	2 m (6.6 ft) cable	440N-G02156	
				4 m (13.1 ft) cable	440N-G02157	
				8-pin Micro QD	440N-G02161	

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

Table 30 - Connection Systems

Description	Cat. No.	
	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 [6.6 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 [3.3 ft]), 2 (2 m [6.6 ft]), 3 (3 m [9.8 ft]), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) for standard cable lengths.

Accessories

Description	Cat. No.
FRS 6, 9, 10 plastic replacement actuator	440N-A02025
FRS 13, 14 stainless steel replacement actuator	440N-A02165

Approximate Dimensions

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

Figure 24 - FRS 6, 9, and 10

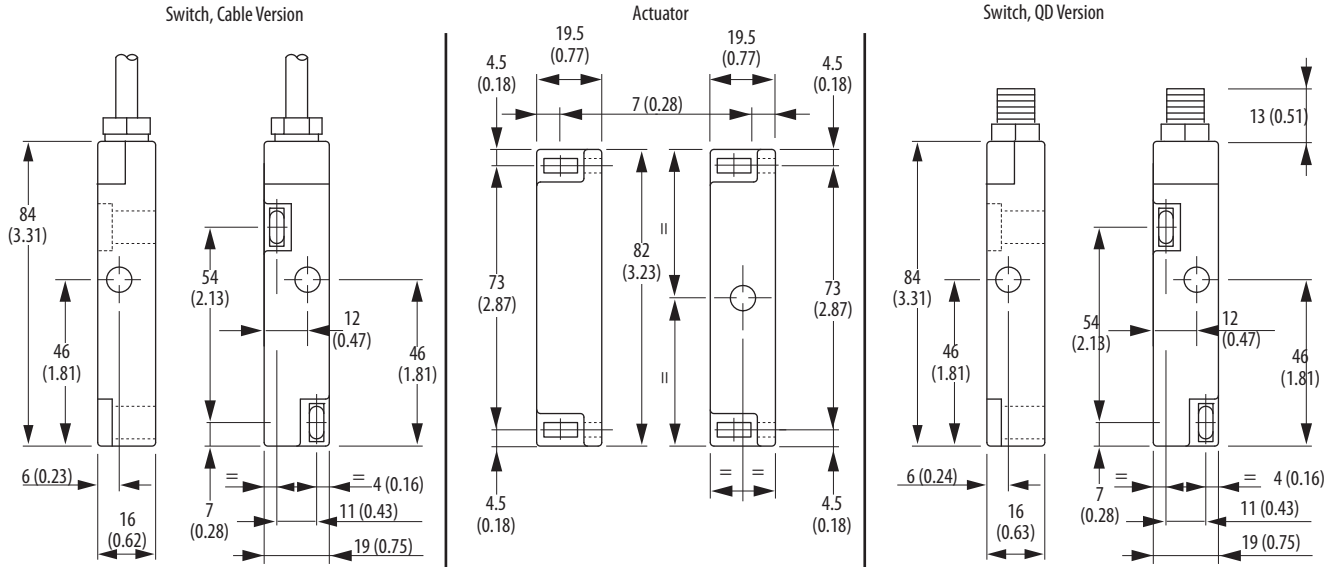
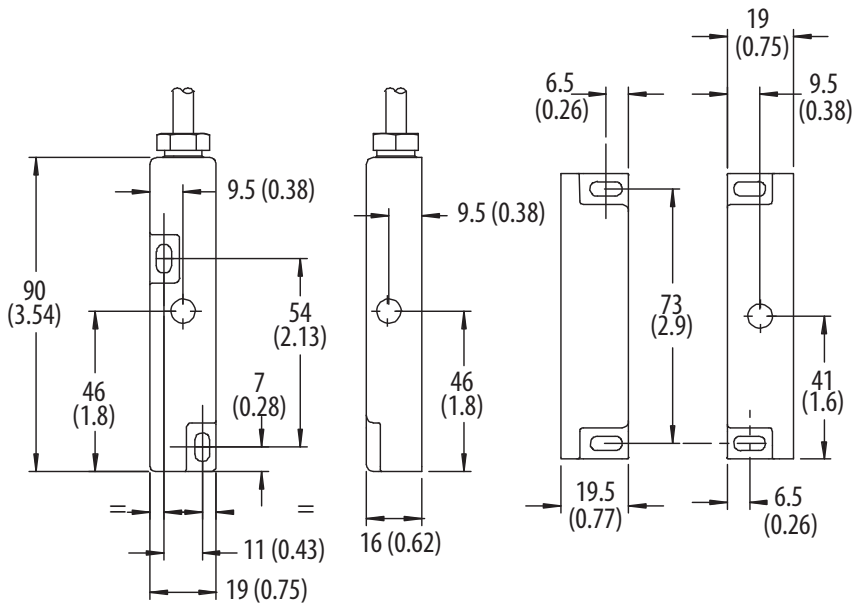
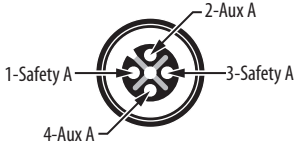
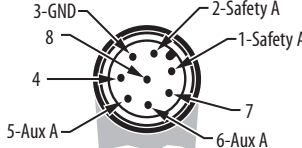


Figure 25 - FRS 13 and 14



Typical Wiring Diagrams

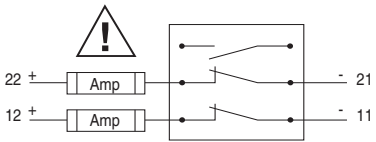
Description		FRS 6, 9 and 10 1 N.C.	FRS 13 and 14 1 N.C. and 1 N.C.
4-pin Micro (M12)			—
8-pin Micro (M12)		—	
Cordset 889D-F4AC-x ⁽¹⁾	Brown	Safety A	Safety A
	Blue		
	White	—	Aux A
	Black	—	—
Cordset 889D-F8AB-x ⁽¹⁾	White	—	Safety A
	Brown		—
	Gray		Aux A
	Pink		—
Cable version	Safety A	Brown	Brown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

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



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

Table 31 - 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:

- 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	ISO 14119, IEC 60947-5-3, ISO 13849-1, IEC 62061		
Safety classification	Dual channel interlocks suitable for Cat. 3 or 4 systems		
Functional safety data For up-to-date information, visit ab.rockwellautomation.com/safety	B10d: > 2 x 10 ⁶ operations Dual channel interlock may be suitable for Performance Level PLe or PLd (according to ISO 13849-1) and for use in SIL 2 or SIL 3 systems (according to IEC 62061) depending on application characteristics		
Certifications	CE Marked for all applicable directives and cULus rok.auto/certifications		
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.)]	<ul style="list-style-type: none"> • Safety: 12 (0.47) • Auxiliary: 15 (0.59) 		
Operating distance, break [mm (in.)]	<ul style="list-style-type: none"> • 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			
Material	<ul style="list-style-type: none"> • Housing: stainless steel; BS3146 ANC4B (316L) • Actuator: stainless steel; BS3146 ANC4B (316L) 		
Weight	<ul style="list-style-type: none"> • Sensor: 156 g (0.34 lb) • Actuator: 168 g (0.37 lb) 		

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 (9.8 ft) cable	FRS 20 GD2	440N-G02113
	1 N.C.	1 N.O.	3 m (9.8 ft) cable	FRS 2 GD2	440N-G02112
	2 N.C.		3 m (9.8 ft) cable	FRS 21 GD2	440N-G02117
24V DC, 1 A max	1 N.C.	1 N.O.	3 m (9.8 ft) cable	FRS 2 GD2	440N-G02118
			10 m (32.8 ft) cable	FRS 2 GD2	440N-G02147
	2 N.C.	—	3 m (9.8 ft) cable	FRS 20 GD2	440N-G02119
	2 N.C.	1 N.O.	3 m (9.8 ft) cable	FRS 21 GD2	440N-G02123
			6 m (19.7 ft) cable	FRS 21 GD2	440N-G02143
			10 m (32.8 ft) 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 32 - Connection Systems

Description	Cat. No.
	8-pin Micro (M12)
Cordset	889D-F8AB-x ⁽¹⁾
Patchcord	889D-F8ABDM-y ⁽²⁾

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

Accessories

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 26 - Switch

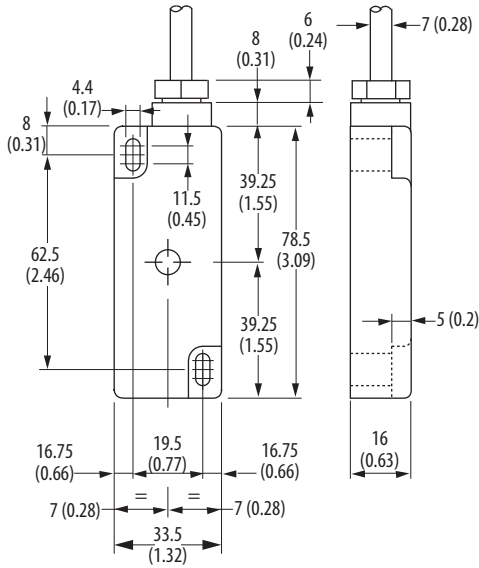
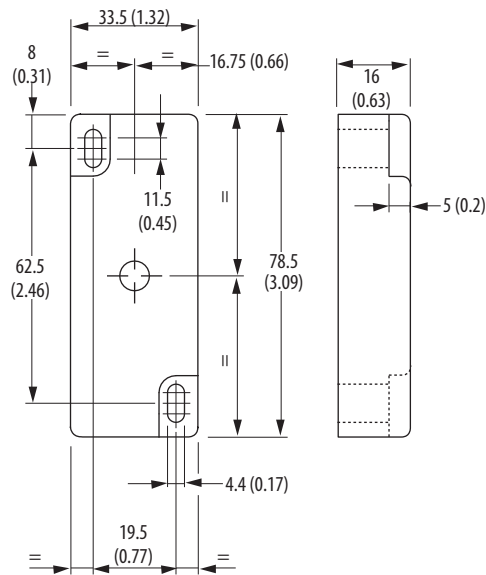


Figure 27 - Actuator



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	—
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	—	—	—

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



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

Table 33 - External Fuse Safety Contacts

Model	Rating
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

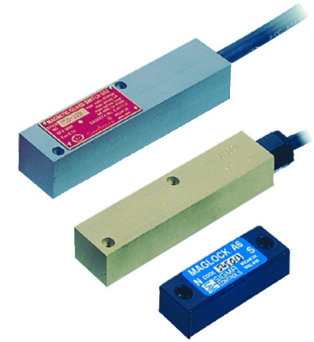
(1) Recommended: Bussman BK/GDA-1.6 A

(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	ISO 14119, IEC 60947-5-3, ISO 13849-1, IEC 62061
Safety classification	Cat. 1 Device per ISO13849-1. Dual channel interlocks suitable for Cat. 3 or 4 systems
Functional safety data For up-to-date information, visit ab.rockwellautomation.com/safety	B10d: > 2 x 10 ⁶ operations Dual channel interlock may be suitable for Performance Level PLe or PLD (according to ISO 13849-1) and for use in SIL 2 or SIL 3 systems (according to IEC 62061) depending on application characteristics
Certifications	
GS1 & GS2	CE Marked for all applicable directives rok.auto/certifications
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	<ul style="list-style-type: none"> • GS1: 12 mm (0.47 in.) • GS2: 15 mm (0.59 in.)
Operating distance, break	<ul style="list-style-type: none"> • GS1: 23 mm (0.91 in.) • GS2: 26 mm (1.02 in.)
Environmental	
Enclosure type rating	IP68 (NEMA 6P)
Operating temperature	<ul style="list-style-type: none"> • GS1: -25...+125 °C (-13...+257 °F) • GS2: -40...+60 °C (-40...+146 °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	
Material	GS1 <ul style="list-style-type: none"> • Housing: Stainless steel; BS3146 ANC4B (316L) • Actuator: Epoxy-painted stainless steel GS2 <ul style="list-style-type: none"> • Housing: Brass • Actuator: Brass
Weight	<ul style="list-style-type: none"> • GS1: 381 g (0.84 lb) • GS2: 388 g (0.86 lb) • Actuator: 116 g (0.24 lb)

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 (6.6 ft) cable	Brass	1 N.C.	None	GS 1	440N-G02048
		Stainless steel				440N-G02049
	3 m (9.8 ft) cable	Brass			GS2-Ex (brass)	440N-H02046
		Stainless steel			GS2-Ex (stainless steel)	440N-H02047

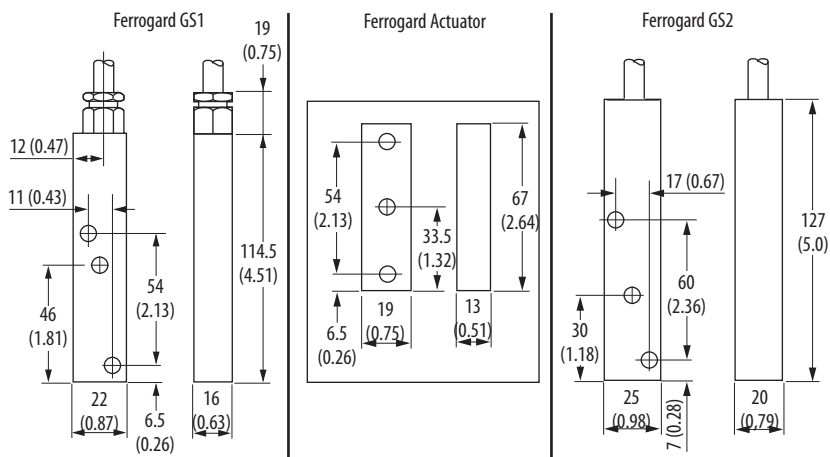
(1) Contacts are described with the guard door closed, that is, actuator in place. Switch is shipped with complete actuator.

Accessories

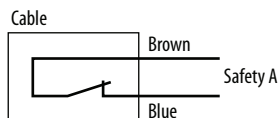
Description	Used with	Cat. No.
Actuator, Alnico	Brass switch	440N-A02056
Actuator, epoxy-painted	Stainless steel switch	440N-A02057

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 34 - External Fuse Safety Contacts

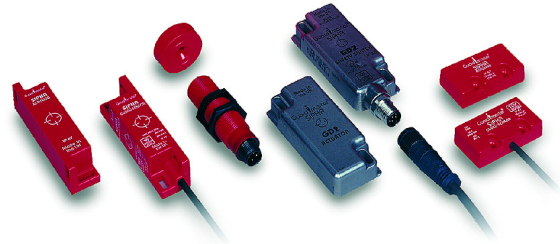
GS1 GS2	AC 1.6 A ⁽¹⁾ ≤ (F) IEC 60127-2
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(1) Recommended: Bussman BK/GDA-1.6 A

Sipha Sensors

Sipha™ sensors have the following features:


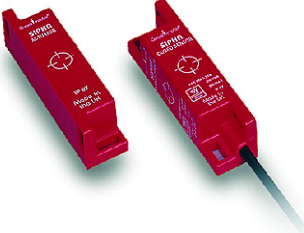


- Non-contact actuation
- Magnetically coded sensing
- Four housing styles
- Must be operated with its own safety control unit



Specifications

Attribute	Value
Safety Ratings	
Standards	ISO 14119, ISO 13849-1, IEC 60947-5-3, IEC 62061, IEC 61508
Safety classification	Rating dependent on control unit and application
Functional safety data For up-to-date information, visit ab.rockwellautomation.com/safety	B10d: > 2 x 10 ⁶ operations Dual channel interlock may be suitable for Performance Level PLe or PLd (according to ISO 13849-1) and for use in SIL 2 or SIL 3 systems (according to IEC 62061) depending on application characteristics
Certifications	CE Marked for all applicable directives, cULus, and TÜV rok.auto/certifications
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	<ul style="list-style-type: none"> • S1 and S3: 5 mm (0.20 in.) • S2: 9 mm (0.35 in.) • S4: 10 mm (0.39 in.)
Sensing distance, break	<ul style="list-style-type: none"> • S1: 11 mm (0.43 in.) • S2 and S3: 12 mm (0.47 in.) • S4: 13 mm (0.51 in.)
Environmental	
Enclosure type rating	IP67 (NEMA 6P)
Operating temperature	<ul style="list-style-type: none"> • S1, S2, and S3: -10...+55 °C (14...131 °F) • S4 (GD2): -25...+125 °C (-13...+257 °F)
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	<ul style="list-style-type: none"> • S1 and S2: Molded ABS • S30 (Actuator): Polyester • S31 (Sensor): Nylon (Trogamid) • S4 (GD2): Stainless steel
Mounting	Any position
Weight	S1 <ul style="list-style-type: none"> • Sensor: 18 g (0.04 lb) • Actuator: 15 g (0.03 lb) S2 <ul style="list-style-type: none"> • Sensor: 20 g (0.04 lb) • Actuator: 30 g (0.07 lb) S3 <ul style="list-style-type: none"> • Sensor: 18 g (0.04 lb) • Actuator: 6 g (0.01 lb) S4 <ul style="list-style-type: none"> • Sensor: 150 g (0.33 lb) • Actuator: 170 g (0.37 lb)

Product Selection

Housing Style	Housing Material	Safety Contacts ⁽¹⁾	Auxiliary Contacts ⁽¹⁾	Type	Connection	Cat. No.
	ABS plastic	1 N.C. and 1 N.O.	None	S11	3 m (9.8 ft) cable	440N-S32014
					10 m (32.8 ft) cable	440N-S32016
			1 N.C.	S12	3 m (9.8 ft) cable	440N-S32022
					10 m (32.8 ft) cable	440N-S32032
			1 N.O.	S13	3 m (9.8 ft) cable	440N-S32037
					10 m (32.8 ft) cable	440N-S32036
None	S21	3 m (9.8 ft) cable	440N-S32015			
		10 m (32.8 ft) cable	440N-S32017			
	ABS plastic	1 N.C. and 1 N.O.	1 N.C.	S22	3 m (9.8 ft) cable	440N-S32023
					10 m (32.8 ft) cable	440N-S32033
			1 N.O.	S23	3 m (9.8 ft) cable	440N-S32038
	Actuator— Polyester Sensor— Nylon (Trogamid)	1 N.C. and 1 N.O.	None	S31	3 m (9.8 ft) cable	440N-S32101
					4-pin Micro (M12)	440N-S32024
	Stainless steel	1 N.C. and 1 N.O.	1 N.C.	S42	8-pin Micro (M12)	440N-S32047
					3 m (9.8 ft) cable	440N-S32055
					10 m (32.8 ft) cable	440N-S32056
			1 N.O.	S43	8-pin Micro (M12)	440N-S32046
					3 m (9.8 ft) cable	440N-S32053
10 m (32.8 ft) cable	440N-S32054					

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


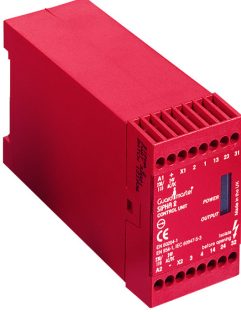

Table 35 - Connection Systems

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

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 28 - Sipa S1

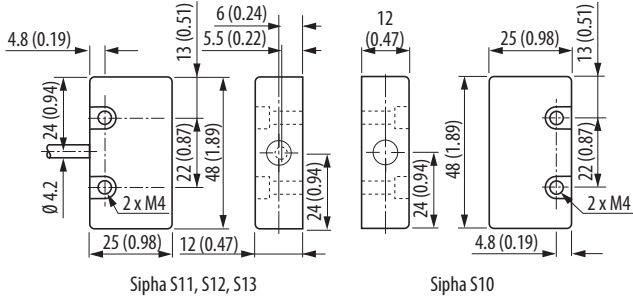


Figure 30 - Sipa S3

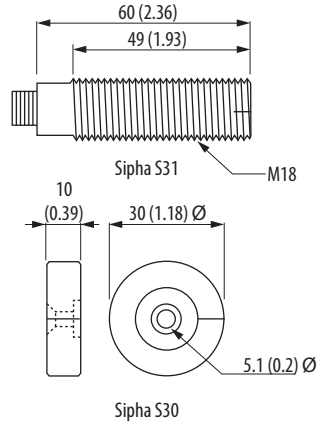


Figure 29 - Sipa S2

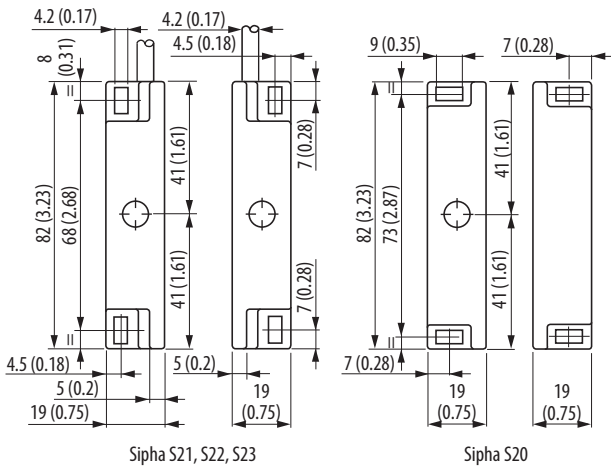
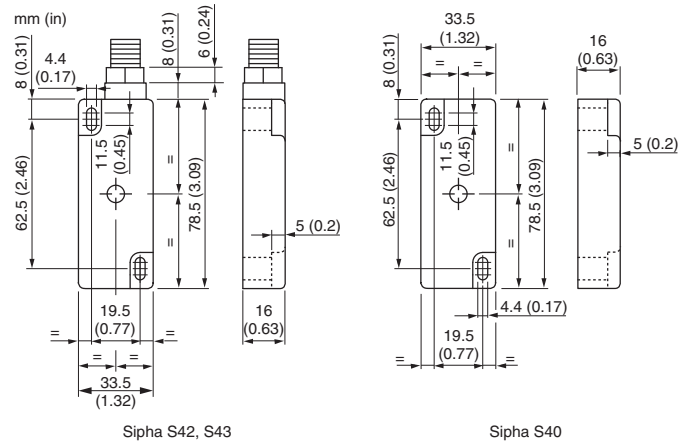


Figure 31 - Sipa S4


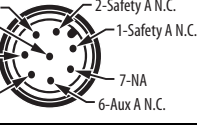
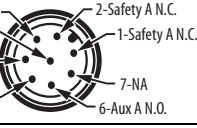


Typical Wiring Diagrams

Table 36 - 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 37 - S31, S42, and S43

Description		S31	S42	S43
4-pin Micro (M12)		 <p>1-Safety A NC 2-Safety B NO 3-Safety A NC Safety B NO</p>	—	—
8-pin Micro (M12)		—	 <p>3-Ground 2-Safety A N.C. 8-Safety B N.O. 1-Safety A N.C. 4-Safety B N.O. 7-NA 5-Aux A N.C. 6-Aux A N.C.</p>	 <p>3-Ground 2-Safety A N.C. 8-Safety B N.O. 1-Safety A N.C. 4-Safety B N.O. 7-NA 5-Aux A N.O. 6-Aux A N.O.</p>
4-pin Cordset 889D-F4AC-x ⁽¹⁾	Brown	Safety A_N.C.	—	—
	Blue			
	White	Safety B_N.O.	—	—
	Black			
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	—	Gnd	Gnd

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

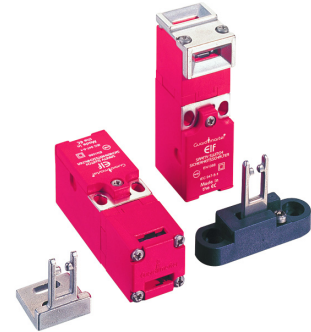
Notes:

Interlocking Switches - Electromechanical (Voltage-free Contacts)

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	See publication SAFETY-SR001			
Certifications	cULus Listed, TÜV Certified, and CE Marked for all applicable directives rok.auto/certifications			
Outputs				
Safety contacts ⁽¹⁾ Direct opening action	1 N.C.		2 N.C.	
Auxiliary contacts	1 N.O.		None	
Thermal current/ <i>I_{th}</i>	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, max	160 mm (6.29 in.)/s			
Actuation frequency, max	2 cycles/s			
Operating radius, min	150 mm (5.9 in.) [60 mm (2.36 in.) with GD2 kit]			
Mechanical life	1,000,000 operations			
Environmental				
Enclosure type rating	IP67			
Operating temperature	-20...+80 °C (-4...+176 °F)			
Physical Characteristics				
Material	<ul style="list-style-type: none"> • Housing: UL approved glass-filled PBT • Actuator: 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 Adapter	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 39](#).

(2) With a 5-pin micro (M12) connector, not all contacts are connected. See [Typical Wiring Diagrams on page 76](#) for wiring details.

Table 38 - 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-P4zKT-DM4 ⁽³⁾	898D-4zLT-DM4 ⁽³⁾	—
Shorting plug	898D-4IKU-DM	898D-4ILU-DM	—
T-port	898D-43KY-D4	898D-43LY-D4	—

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




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




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

Table 39 - 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

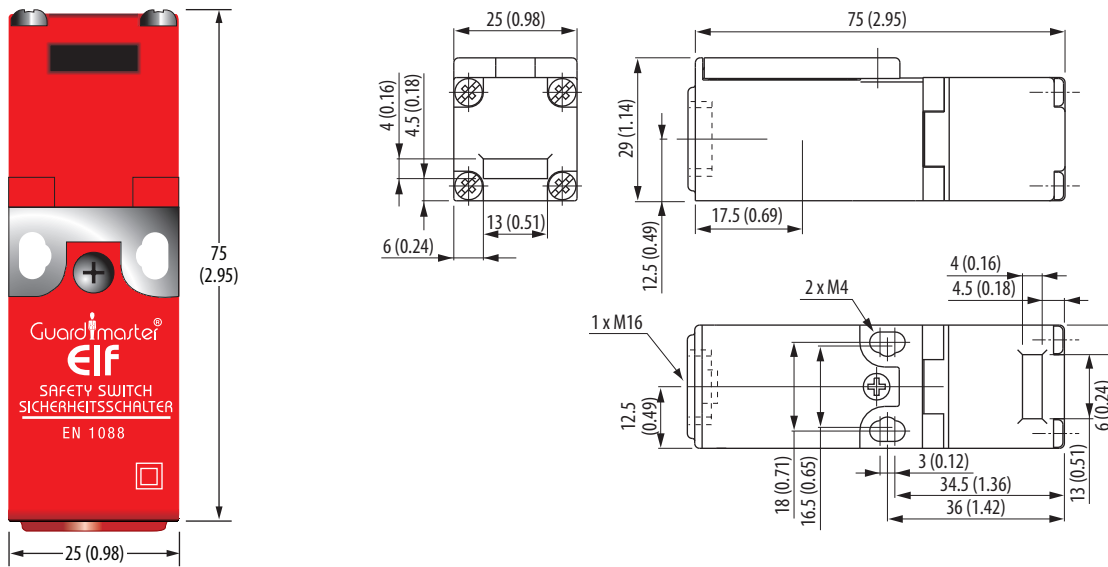
Accessories

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

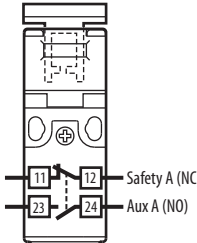
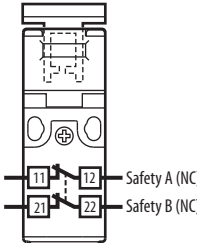
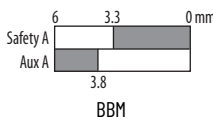
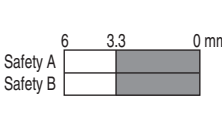
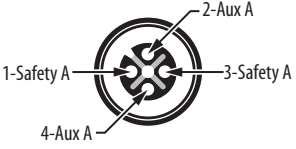
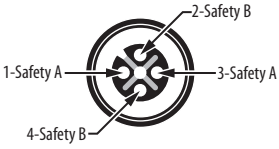
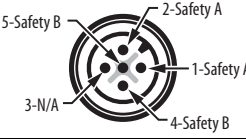
Description	Cat. No.
 Metal alignment guide	440K-A21069
 Replacement cover	440A-A33085
 Dust cover	440K-A17182

Approximate Dimensions

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



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		—	
Cordset 889D-F4AC-x ⁽¹⁾	Brown	Safety A	Safety A
	Blue	Safety A	Safety A
	White	Aux A	Safety B
	Black	Aux A	Safety B

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

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	See publication SAFETY-SR001			
Certifications	cULus Listed, TÜV Certified, and CE Marked for all applicable directives rok.auto/certifications			
Outputs				
Safety contacts ⁽¹⁾	2 N.C.			3 N.C.
Direct Opening Action				
Auxiliary contacts	1 N.O.			None
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
DC-13 (Ue)	24V			
DC-13 (Ie)	2 A			
Operating Characteristics				
Break contact force	15 N (3.37 lbf), min			
Actuation speed, max	160 mm (6.29 in.)/s			
Actuation frequency, max	2 cycles/s			
Operating radius, min	150 mm (5.9 in.) [60 mm (2.36 in.) with GD2 kit]			
Mechanical Life	1,000,000 operations			
Environmental				
Enclosure type rating	IP67			
Operating temperature	-20...+80 °C (-4...+176 °F)			
Physical Characteristics				
Material	<ul style="list-style-type: none"> • Housing: UL approved glass-filled PBT • Actuator: 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 39 on page 74](#).

(2) With a 5-pin micro (M12) connector, not all contacts are connected. See [Typical Wiring Diagrams on page 80](#) for wiring details.




Table 40 - 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 [6.6 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 [3.3 ft]), 2 (2 m [6.6 ft]), 3 (3 m [9.8 ft]), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) for standard cable lengths.

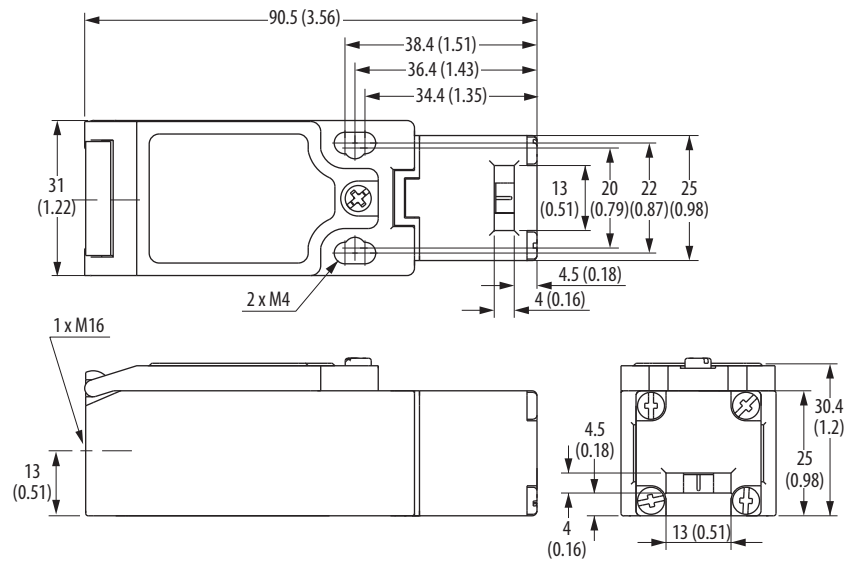
Accessories

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

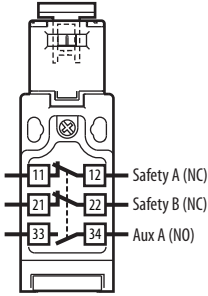
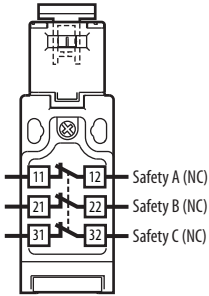
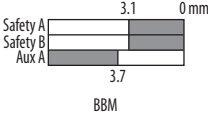
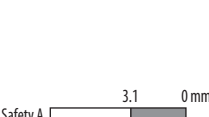
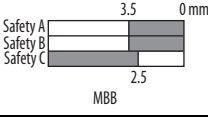

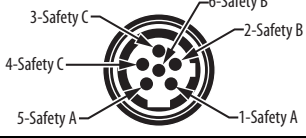
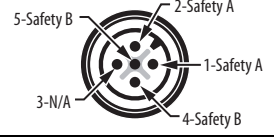
Description	Cat. No.
 Replacement cover	440A-A21115
 Dust cover	440K-A17182

Approximate Dimensions

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



Typical Wiring Diagrams

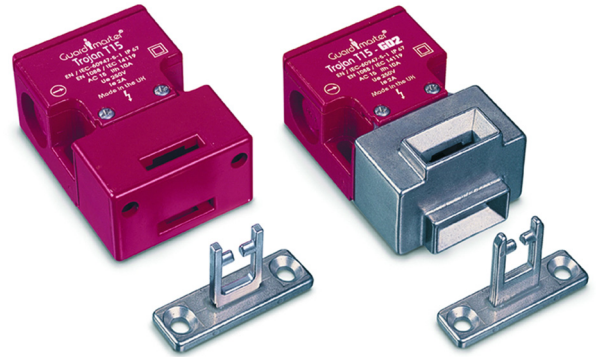
Description		2 N.C. & 1 N.O.	3 N.C.
Contact Configuration			
Contact Action □ Open ■ Closed			
			
6-pin Micro (M12)			
5-pin Micro (M12)		—	
Cordset 889R-F6ECA-x ⁽¹⁾	Red/White	Safety A	Safety A
	Red/Black		
	Red	Safety B	Safety B
	Red/Blue		
	Green	Aux A	Safety C
Red/Yellow			

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

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	See publication SAFETY-SR001			
Certifications	cULus Listed, TÜV Certified, and CE Marked for all applicable directives rok.auto/certifications			
Outputs				
Safety contacts ⁽¹⁾ Direct opening action	2 N.C.			2 N.C.
Auxiliary contacts	None			1 N.O.
Thermal current/ <i>I_{th}</i>	10 A			
Rated insulation voltage (U _i)	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, max	160 mm (6.29 in.)/s			
Actuation frequency, max	2 cycles/s			
Operating radius, min	175 mm (6.89 in.) [60 mm (2.36 in.) with GD2 kit]			
Mechanical life	1,000,000 operations			
Environmental				
Enclosure type rating	IP67			
Operating temperature	-20...+80 °C (-4...+176 °F)			
Physical Characteristics				
Material	<ul style="list-style-type: none"> • Housing: UL approved glass-filled PBT • Actuator: 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 39 on page 74](#).

Table 41 - 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-P4zKT-DM4 ⁽³⁾	898D-4zLT-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 [6.6 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 [3.3 ft]), 2 (2 m [6.6 ft]), 3 (3 m [9.8 ft]), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) for standard cable lengths.

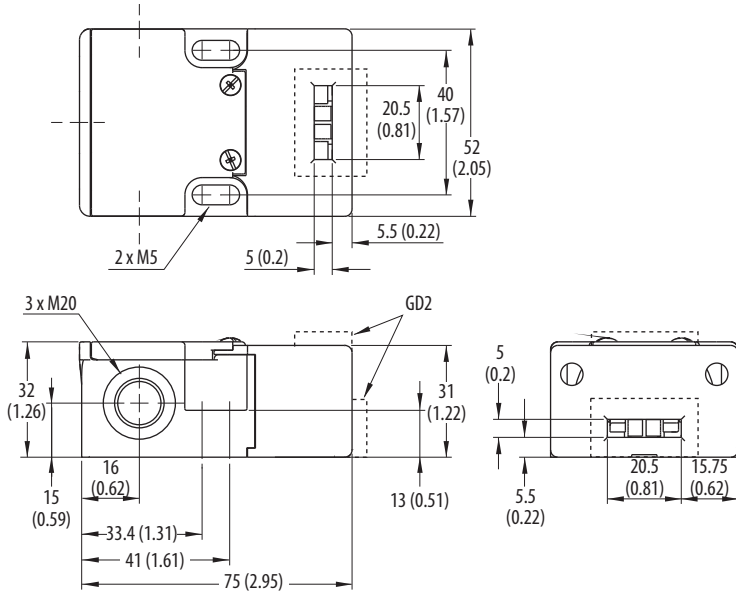
(3) Replace z with 4 or 8 for number of ports.

Accessories

Description	To Be Used With	Cat. No.
	Standard actuator	Trojan T15 standard models only
	GD2 standard actuator	Trojan GD2 models only
	GD2 flat actuator	Trojan GD2 models only
	Alignment guide with semi-flexible actuator	Discard alignment guide for GD2 models
	Alignment guide with fully flexible actuator	Discard alignment guide for GD2 models
	Sliding bolt actuator	Trojan GD2 models only
	Catch and retainer kit	Trojan T15 standard models only
	Replacement cover	All models
	Dust cover	All models

Approximate Dimensions

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



Typical Wiring Diagrams

Description		1 N.C. & 1 N.O.	1 N.C.
Contact Configuration			
Contact Action □ Open ■ Closed			
4-pin Micro (M12)			
5-pin Micro (M12)		—	
Cordset 889D-F4AC-x ⁽¹⁾	Brown	Safety A	Safety A
	Blue		
	White	Aux A	Safety B
	Black		

(1) Replace x with 2 (2 m [6.6 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	See publication SAFETY-SR001			
Certifications	cULus Listed, TÜV Certified, and CE Marked for all applicable directives rok.auto/certifications			
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_{th}	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) and 30 N (6.75 lbf)			
Trojan 6 switch	20 N (4.5 lbf)			
Actuation speed, max	160 mm (6.29 in.)/s			
Actuation frequency, max	2 cycles/s			
Operating radius, min	175 mm (6.89 in.) [60 mm (2.36 in.) with flexible actuator]			
Mechanical life	1,000,000 operations			
Environmental				
Enclosure type rating	IP67			
Operating temperature	-20...+80 °C (-4...+176 °F)			
Physical Characteristics				
Material	<ul style="list-style-type: none"> • Housing: UL approved glass-filled PBT • Actuator: Stainless steel 			
Weight	160 g (0.35 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

Table 42 - 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			BBM	Standard	440K-T11333	440K-T91024	440K-T11492	—

(1) For connector ratings, see [Table 39 on page 74](#).

(2) With a 5-pin micro (M12) connector, not all contacts are connected. See [Typical Wiring Diagrams on page 89](#) for wiring details.

Table 43 - 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-W21MNP	
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	—
	2 N.C.	2 N.O.	BBM	GD2 standard	440K-T11445	440K-T11425	—
				—	440K-T11459	440K-T11433	440K-W21BNPH-NG
			MBB	—	440K-T11460	440K-T11461	440K-W21MNP-NG

(1) For connector ratings, see [Table 39 on page 74](#).

(2) With an 8-pin micro (M12) connector, not all contacts are connected. See [Typical Wiring Diagrams on page 89](#) for wiring details.










Table 44 - 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 [6.6 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 [3.3 ft]), 2 (2 m [6.6 ft]), 3 (3 m [9.8 ft]), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) for standard cable lengths.

Accessories

	Description	To Be Used With	Cat. No.
	Standard actuator	Trojan 5 and Trojan 6. Not to be used with GD2 models	440K-A11095
	GD2 standard actuator	GD2 models only	440G-A27011
	GD2 flat actuator	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	GD2 models only	440G-A27163
	Catch and retainer kit	Trojan 5 and Trojan 6. Not to be used with GD2 models.	440K-A11094
	Replacement cover	Trojan T5 standard model only	440A-A11495
		Trojan T5 GD2	440A-A11496
		Trojan T6 standard model only	440A-A11497
		Trojan T6 GD2	440A-A11498
	Dust cover	All models	440K-A17180

Approximate Dimensions

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

Figure 32 - Standard Model

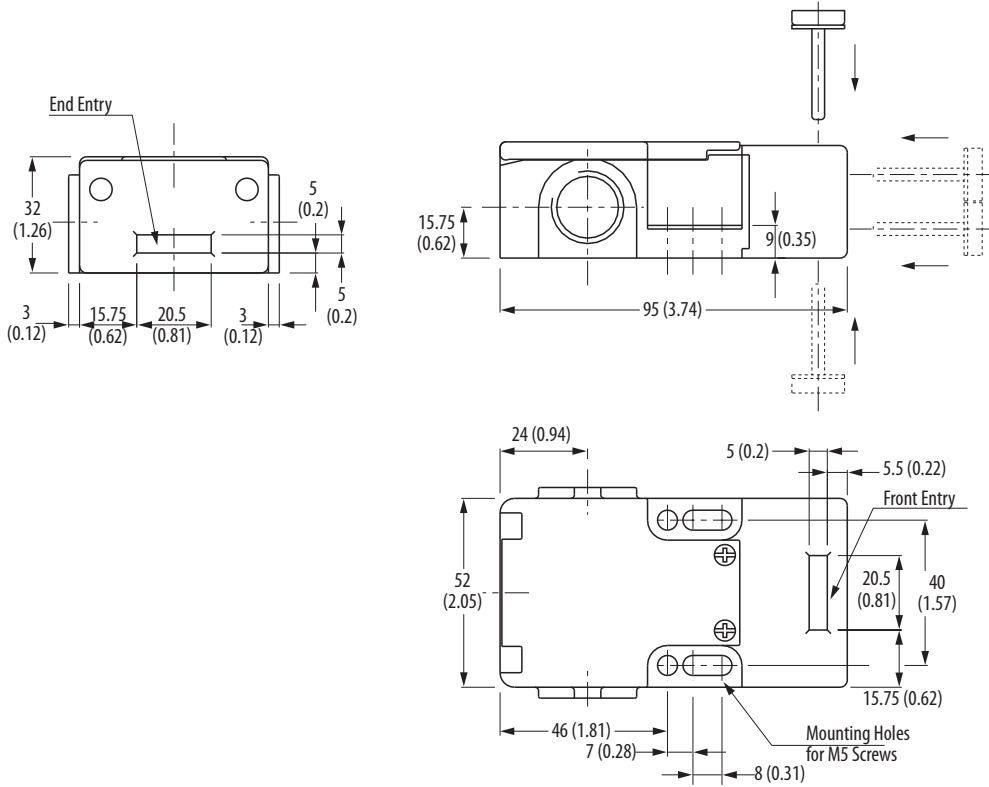
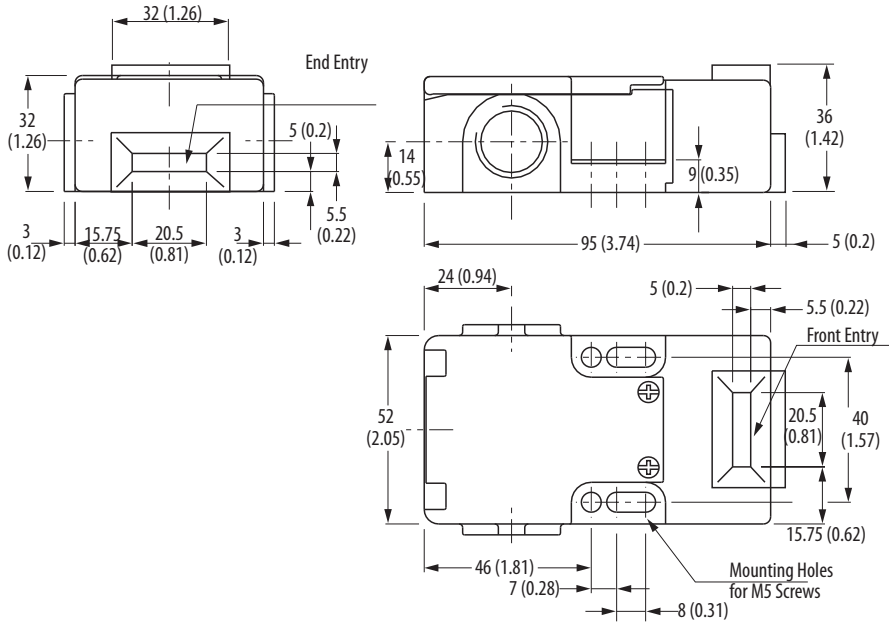
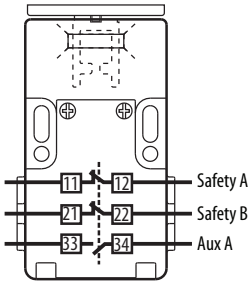
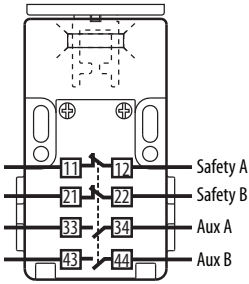
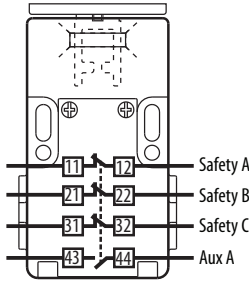
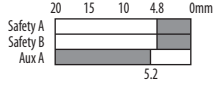
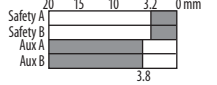
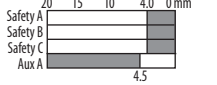
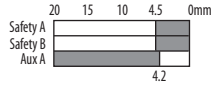
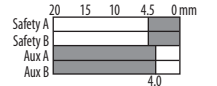


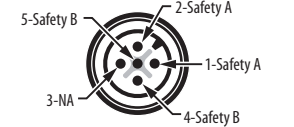
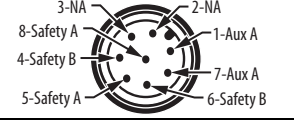


Figure 33 - GD2 Model



Typical Wiring Diagrams

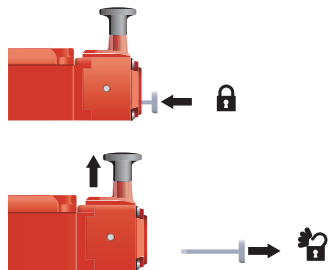
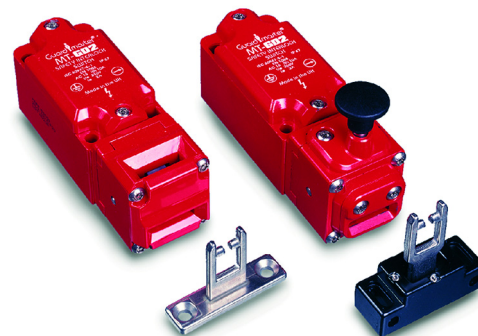
Description	Trojan 5	Trojan 6		
	2 N.C. & 1 N.O.	2 N.C. & 2 N.O.	3 N.C. & 1 N.O.	
Contact Configuration				
Contact Action □ Open ■ Closed	 BBM 5.2	 BBM 3.8	 BBM 4.5	
	 MBB 4.2	 MBB 4.0	 MBB 4.0	
6-pin Micro (M12)		—	—	
5-pin Micro (M12) for ArmorBlock Guard I/O		—	—	
8-pin Micro (M12)	—		—	
6-pin Cordset 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⁾	Red/Yellow	—	—	—
	Gray Red	—	Safety A	—
	Yellow Pink	—	Safety B	—
	White Blue	—	Aux A	—
	Green Brown	—	—	—

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

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 minimum 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	See publication SAFETY-SR001			
Certifications	cULus Listed, TÜV Certified, and CE Marked for all applicable directives rok.auto/certifications			
Outputs				
Safety contacts ⁽¹⁾	<ul style="list-style-type: none"> • Standard: 3 N.C. or 2 N.C. direct opening action • Snap acting: 2 N.C. direct opening forced disconnection 			
Auxiliary Contacts				
Standard	1 N.O. or 2 N.O.			
Snap acting	2 N.O.			
Thermal current/ I_{th}	10 A			
Rated insulation voltage (U _i)	500V			
Switching current @ voltage	3 mA @ 18V DC, min			
Utilization Category				
A600/AC-15 (U _e)	600V	500V	240V	120V
A600/AC-15 (I _e)	1.2 A	1.4 A	3.0 A	6.0 A
Standard: DC-13 (U _e)	24V			
Standard: DC-13 (I _e)	2 A			
Snap-acting: A300/AC-15 (U _e)	240V	120V		
Snap-acting: A300/AC-15 (I _e)	3 A	6 A		
Snap-acting: DC-13 (U _e)	24V			
Snap-acting: DC-13 (I _e)	2 A			

Attribute	Value
Operating Characteristics	
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, max	160 mm (6.29 in.)/s
Actuation frequency, max	2 cycles/s
Mechanical life	1,000,000 operations
Environmental	
Enclosure type rating	IP67
Operating temperature	-20...+80 °C (-4...+176 °F)
Physical Characteristics	
Material	<ul style="list-style-type: none"> • Housing: Painted zinc • Actuator: 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 45 - 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	—	—	
				—	440K-MT55005	440K-MT55086	440K-MT55097	440K-M21BNDH	—	
				GD2 standard	440K-MT55076	440K-MT55026	440K-MT55098	—	—	
	2 N.C.	2 N.O.	BBM	Fully flexible	440K-MT55077	440K-MT55087	440K-MT55099	—	—	
				MBB	—	440K-MT55006	440K-MT55089	440K-MT55101	—	—
				—	—	440K-M22ANDT	440K-M22ANDL	440K-M21ANDH	440K-M2NNDS	
			Snap Acting	Extended flat	440K-M22AEDM	440K-M22AEDT	—	—	—	
				GD2 standard	440K-M22ASDM	440K-M22ASDT	—	—	—	
				Fully flexible	440K-M22ABDM	440K-M22ABDT	—	—	—	

(1) For connector ratings, see [Table 39 on page 74](#).

(2) With an 8-pin micro (M12) connector, not all contacts are connected. See [Typical Wiring Diagrams on page 93](#) for wiring details.

(3) With a 5-pin micro (M12) connector, not all contacts are connected. See [Typical Wiring Diagrams on page 93](#) for wiring details.

Table 46 - 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	—	—
—	2 N.C.	2 N.O.		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 39 on page 74](#).

(2) With a 5-pin micro (M12) connector, not all contacts are connected. See [Typical Wiring Diagrams on page 93](#) for wiring details.

Table 47 - 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-P4zLT-DM4 ⁽³⁾	—	—	—
Shorting plug	898D-41LU-DM	—	—	—
T-port	898D-43LY-D4	—	—	—




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

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

(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.

Figure 34 - MT-GD2

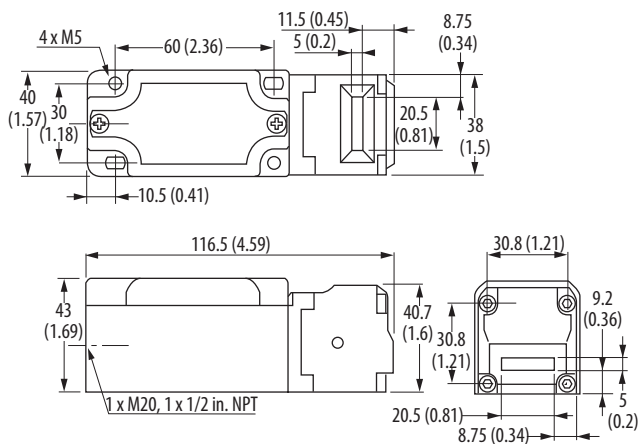
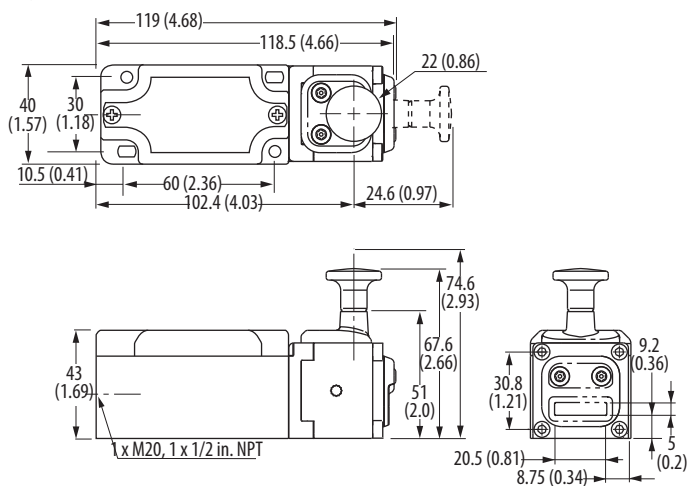
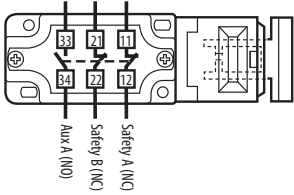
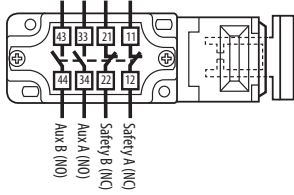
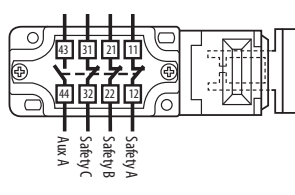
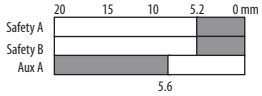
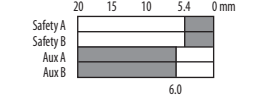
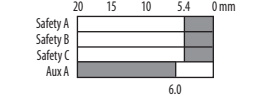
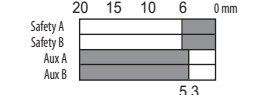
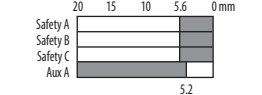
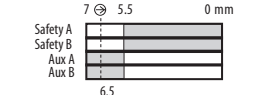
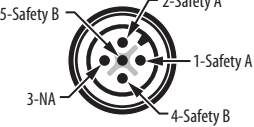
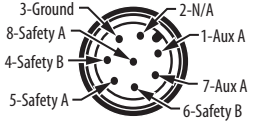
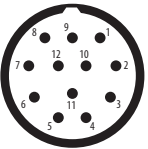


Figure 35 - MT-GD2 Latch Release



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				
		—		
		—		—
5-pin Micro (M12) for ArmorBlock Guard I/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⁾	Gray 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 Gray	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 [6.6 ft]), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) for standard cable lengths.

Notes:



Overview

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 36 - Plant and Machinery Interlocking

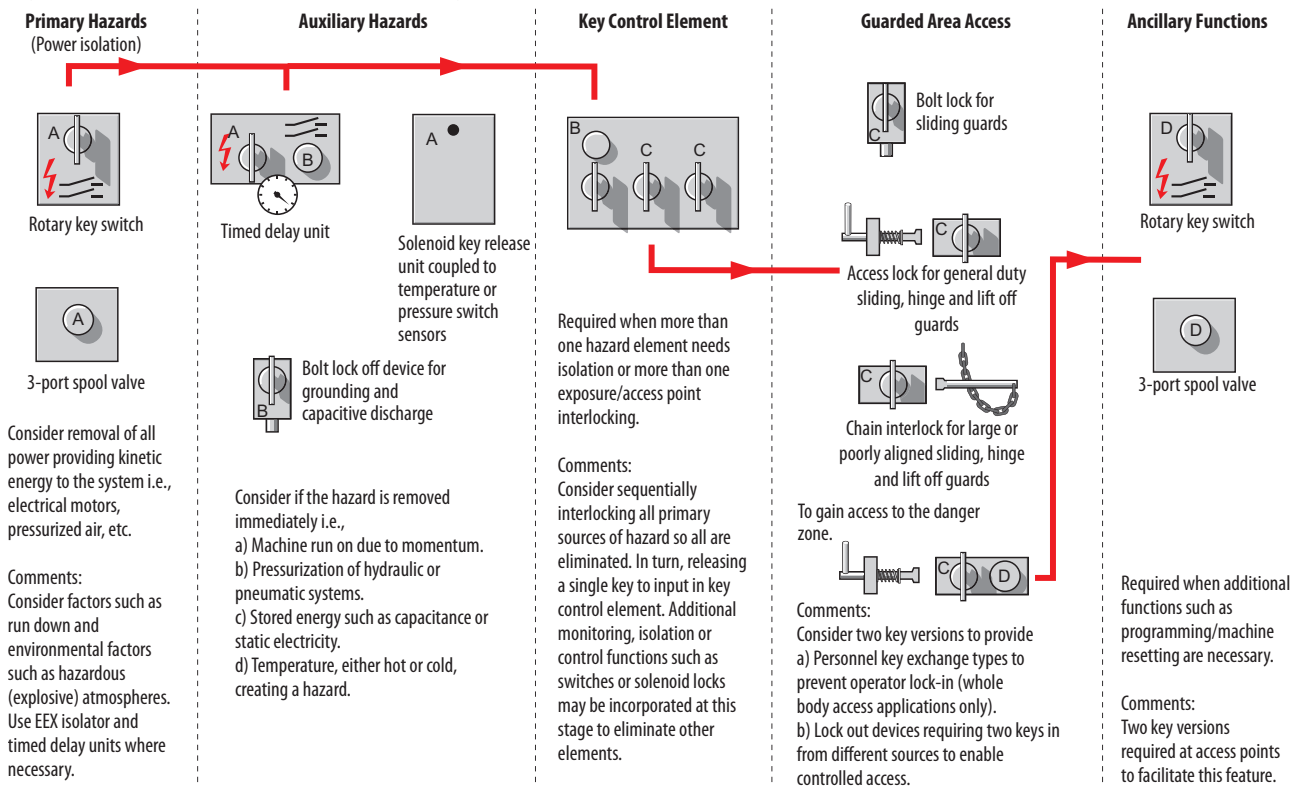
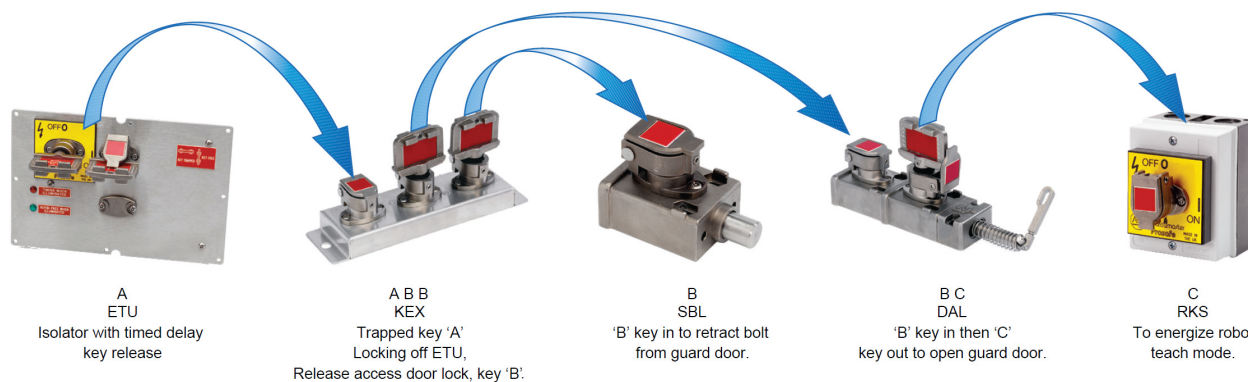


Figure 37 - Illustrated Principals of Trapped Key Interlocking



1. The Electronic Timed-delay Unit (ETU) isolator has two keys. One is a nonremovable key. The other key (an 'A' coded key) can be removed after a timed duration, which a potentiometer inside the ETU isolator sets. 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 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 48 - 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-MKEXE110A0BOB
3	1	Single bolt lock, B primary key	440T-MSBLE100B
4	1	Dual access lock, B primary key, C secondary key trapped (included)	440T-MDALE100BOC
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.

Application Examples

Figure 38 - Part Body Access

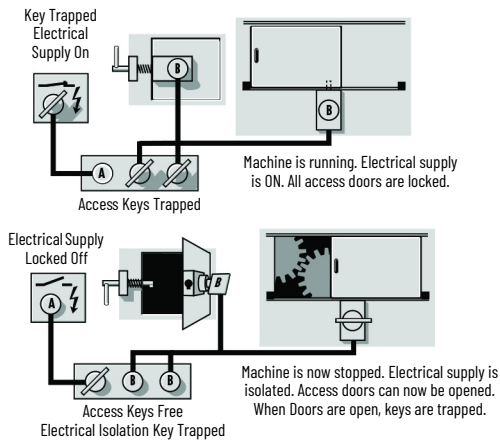
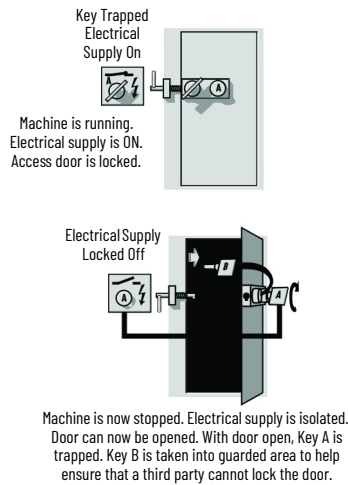


Figure 39 - Full Body Access

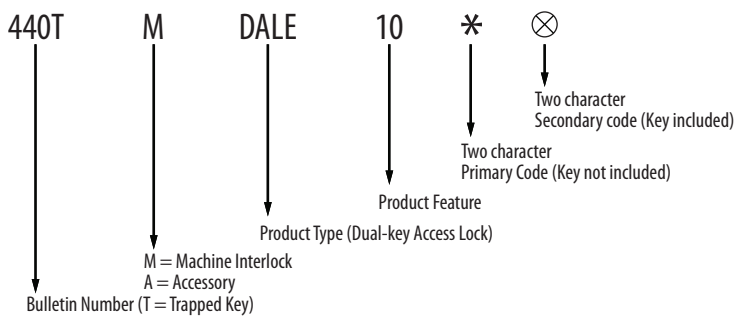


Code Selection

To order Prosafe® trapped key products, you must include codes in the catalog number.

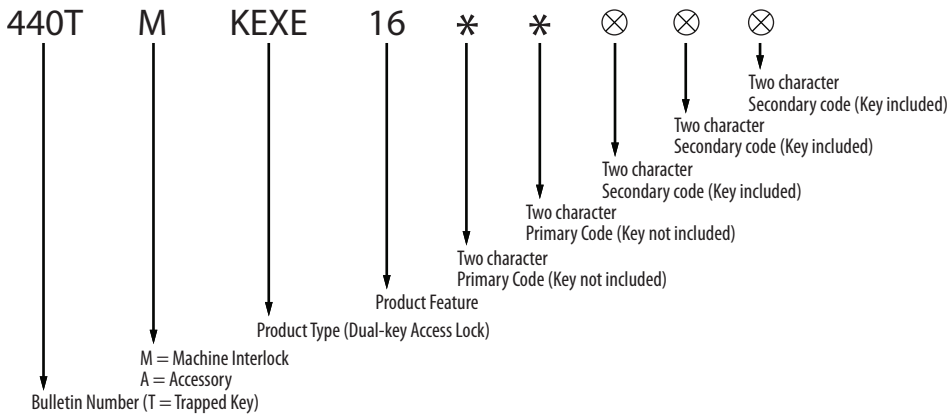
- The codes are added to the end of the catalog number.
- Each code must be two or three characters in length.
- The first code is the primary code and the last codes, if necessary, are the secondary codes.
- Primary codes are not included. The key must be ordered separately or must come from a previous operation.
- Secondary codes come with the product, as the key is trapped in the code barrel.
- Use [Table 49 on page 99](#) to select and track codes.

Figure 40 - Order 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 41 - Order 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...z, Aa...Zz, Aaa...Eac (first letter A...E; second letter a...f; third letter a...z). 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	Aa		Ab	
			Ba		Bb	
			Ca		Cb	
			Da		Db	
		ime 67				

Table 49 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 49 - 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 ⁽¹⁾		Qb ⁽¹⁾		Qc ⁽¹⁾		Qd ⁽¹⁾		Qe ⁽¹⁾		Qf ⁽¹⁾	
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	

(1) Key Code Q only available as Engineered to Order.

Rotary 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 Classification (Safety)		EN ISO 14119 and GS-ET-31, and can be used in safety application up to category 3, PLd in accordance with EN ISO 13849-1, and in the application area of EN 60204-1.			
Functional Safety Data		PFHD = 1.00E-7 (probability of dangerous failure per hr); T1 = 20 (Proof test interval)			
Certifications		CE Marked for all applicable directives, and TÜV Certified, see rok.auto/certifications			
Conduit entry		4 x M20 (RKS only)			
Operating temperature		-10...+40 °C (14...104 °F) Enclosed: -25...+40 °C (-13...+104 °F)			
Mechanical life		200,000 operations			
Shear force to key, max		15.1 kN (3394.62 lbf)			
Torque to key, max		14 N•m (10.33 lb•ft)			
Relative humidity		95%			
Finger protection		DIN 57106/VDE 0106 T.100			
Weight	RPSE	10, 11, 12, 13, 20: 500 g (1.1 lb)	14, 16: 1000 g (2.2 lb)		
	RKSE	10, 11, 12, 13: 850 g (1.9 lb)	14: 1250 g (2.8 lb)		
Climatic test		<ul style="list-style-type: none"> • Constant to DIN IEC 68 Part 2-3 • Variable to DIN IEC 68 Part 2-30 			
Rated insulation voltage (Ui)		690V			
Rated impulse withstand voltage (Uimp)		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 101.)		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, max	750V	750V	750V	1000V
Rated operating 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
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, max		25 A	35 A	63/50 A	100 A
Terminal cross section		1...10		4...16	2.5...3.5
		mm ² single/multiple wire			

Attribute	Value		
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 50 - Enclosure-mounted IP65 (RKS only)

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

(1) Substitute the desired primary code for x (key not included). See [Key Coding on page 98](#) for code selection.





Table 51 - Panel Mounted

Contacts	Current	Cat. No. ⁽¹⁾
4 N.O.	20 A	440T-MRPSE10x
2 N.O. and 2 N.C.	20 A	440T-MRPSE11x
4 N.O.	32 A	440T-MRPSE12x
4 N.O.	63 A	440T-MRPSE13x
3 N.O. and 1 N.O.	3 N.O. 100 A and 1 N.O. 20 A	440T-MRPSE14x
8 N.O.	20 A	440T-MRPSE16x
3 N.O. and 3 N.C.	20 A	440T-MRPSE18x
4 N.O.	40 A	440T-MRPSE20x

(1) Substitute the desired primary code for x (key not included). See [Key Coding on page 98](#) for code selection.



Table 52 - Multi-key Rotary Switches

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

(1) Isolator on first key out.
 (2) Substitute the desired primary code for x (key not included). See [Key Coding on page 98](#) for code selection.
 (3) Substitute the desired secondary code for y (key not included). See [Key Coding on page 98](#) for code selection.

Accessories

Description	Additional Information	Cat. No.
Stainless steel key	See Accessories on page 132 .	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
Adapter, 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 (1 per switch, max)	440T-AACA10
Supplemental contact block, 20 A, 2 N.O. late make, early break	For use with RPSE12, RPSE20 (1 per switch, max)	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 98](#) for code selection.

Approximate Dimensions

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

Figure 42 - MRSE10

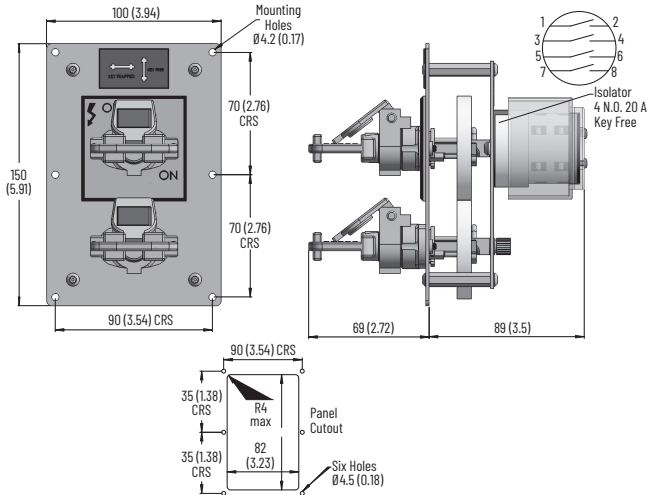


Figure 45 - MRXE30

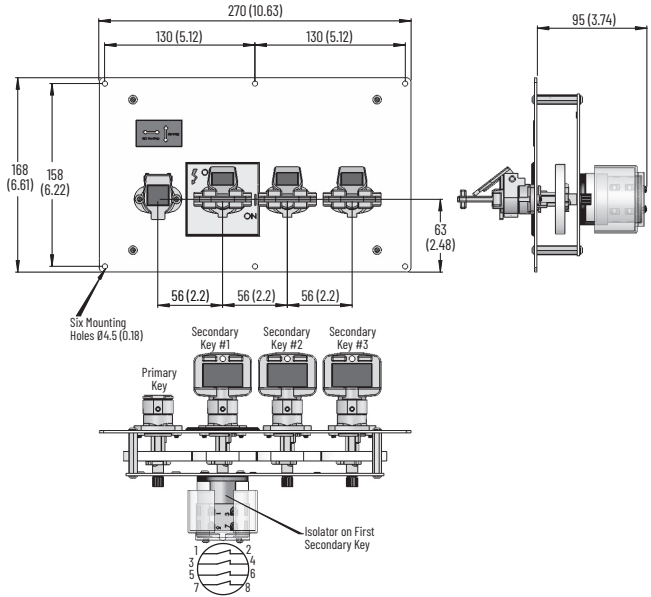


Figure 43 - MRSE20

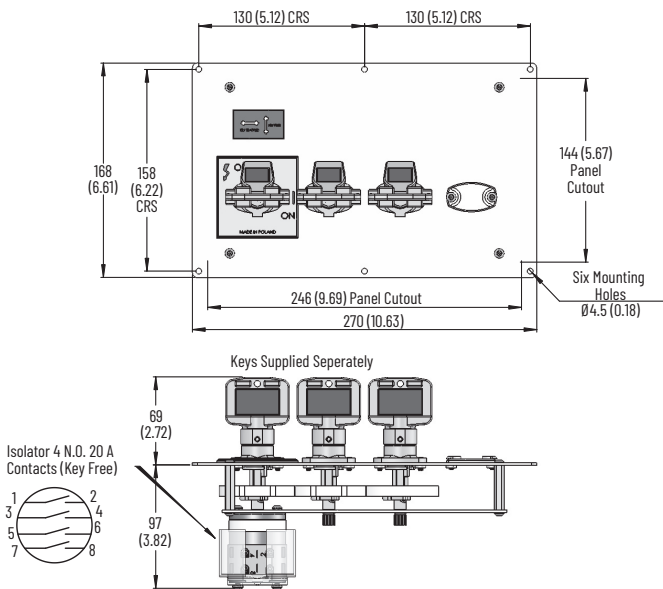


Figure 46 - RKSE10 and RKSE11

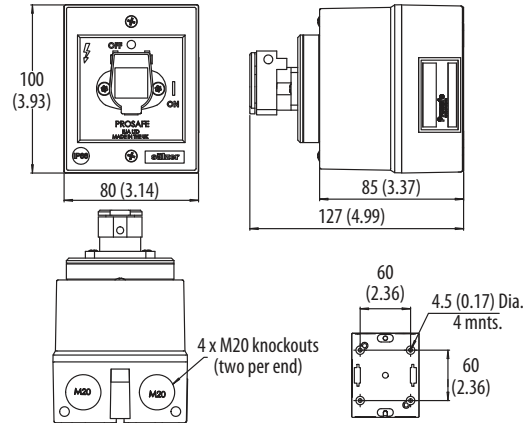


Figure 44 - MRXE10 and MRXE11

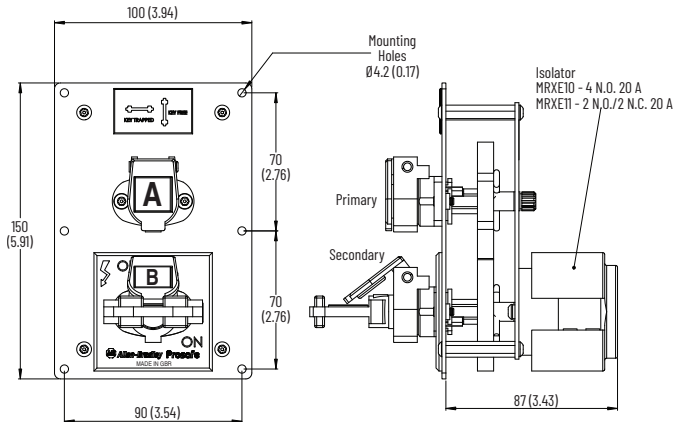


Figure 47 - RKSE12 and RKSE13

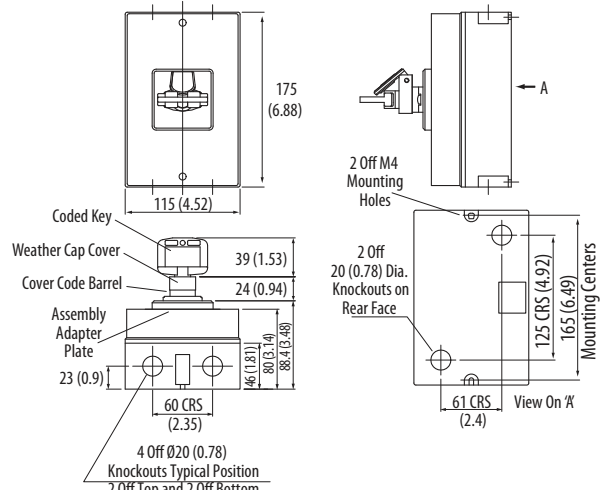


Figure 48 - RKSE14

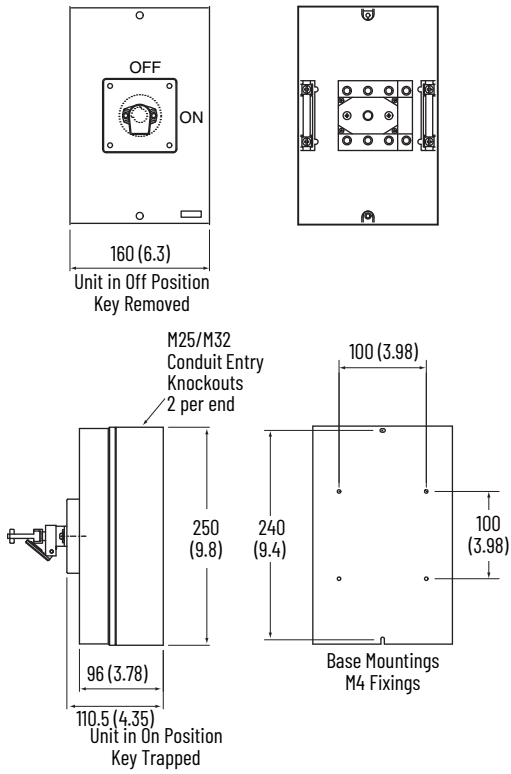


Figure 50 - RPSE12, 13, 14 and 20

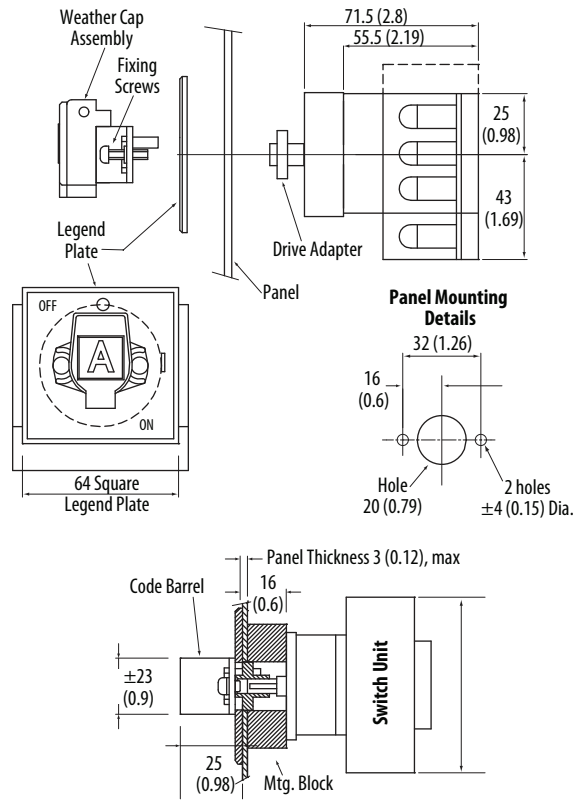


Figure 49 - RPSE10 and RPSE11

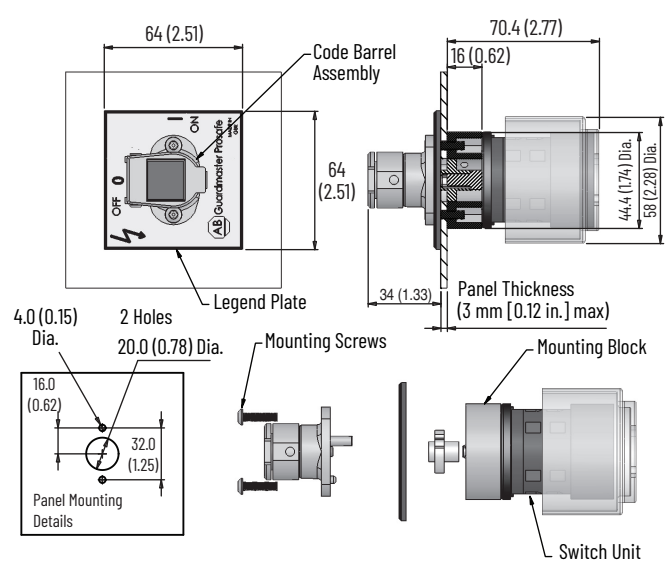
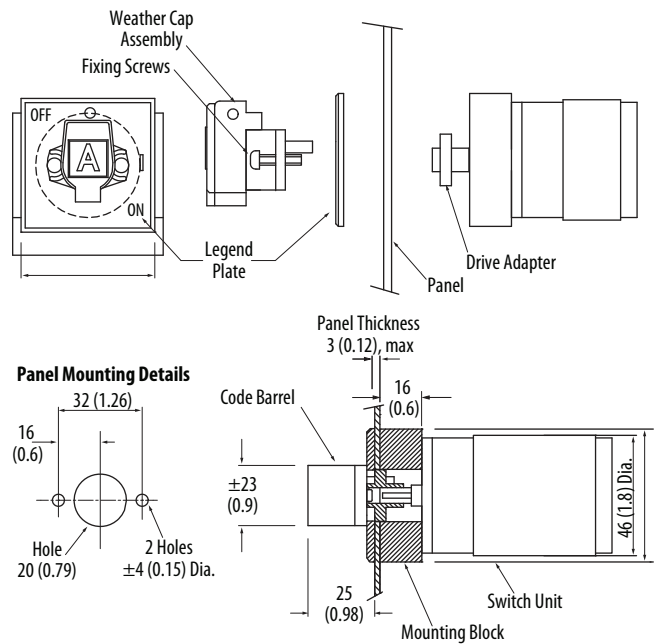
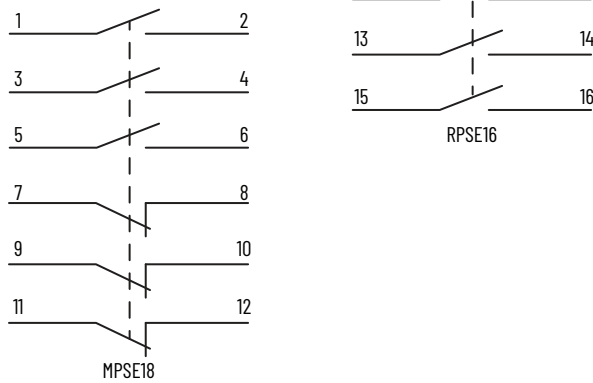
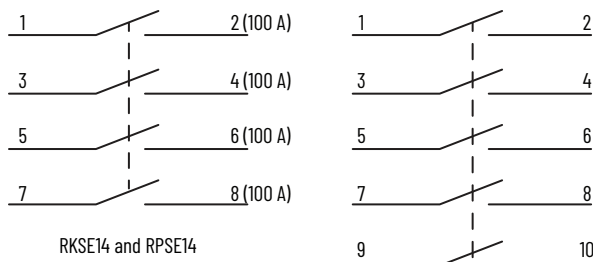
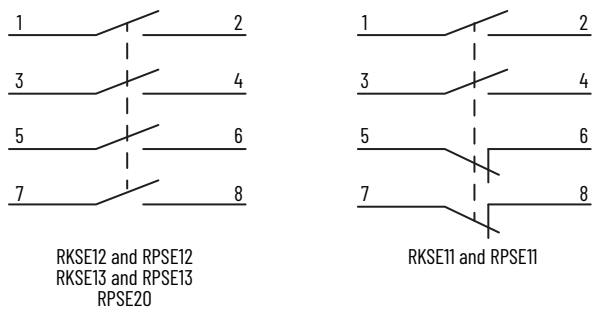


Figure 51 - RPSE16



Typical Wiring Diagrams

Figure 52 - Diagrams Shown with Key Free



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 'key free' status indicator
- 316L stainless steel construction
- 24V DC, 110V 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 Classification (Safety)	EN ISO 14119 and GS-ET-31, and can be used in safety application up to category 3, PLd in accordance with EN ISO 13849-1, and in the application area of EN 60204-1.
Functional Safety Data	PFHD = 1.00E-7 (probability of dangerous failure per hr); T1 = 20 (Proof test interval)
Certifications	CE Marked for all applicable directives, and TÜV Certified, see rok.auto/certifications
Solenoid rating	24V DC (11 W), 110V DC (11 W), 110V AC (17VA), and 230V AC (17VA)
Solenoid power	<ul style="list-style-type: none"> • DC Types: 6.5 W continuous • AC Types: 6V A continuous
Electrical characteristics	See Specifications on page 100 .
Mounting	Any position
Shear force to key, max	15.1 kN (3394.62 lbf)
Torque to key, max	14 N•m (10.33 lb•ft)
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	<ul style="list-style-type: none"> • 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	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⁾	
	110V AC	2 N.O. and 2 N.C.	20 A	440T-MSRUE12x ⁽¹⁾	
		4 N.O.		440T-MSRUE22x ⁽¹⁾	
	230V AC	2 N.O. and 2 N.C.	20 A	440T-MSRUE20x ⁽¹⁾	
		4 N.O.		440T-MSRUE23x ⁽¹⁾	
	110V DC	2 N.O. and 2 N.C.	20 A	440T-MSRUE33x ⁽¹⁾	
		4 N.O.		440T-MSRUE30x ⁽¹⁾	
	110V DC	3 N.O. and 3N.C.	20 A	440T-MSRUE34x ⁽¹⁾	
		4 N.O.		440T-MSRUE44x ⁽¹⁾	
	Dual Key Out	24V DC	4 N.O.	20 A	440T-MSRUE40x ⁽¹⁾
			2 N.O. and 2 N.C.		440T-MSRUE46x ⁽¹⁾
4 N.O.			440T-MS2097Dxx ⁽¹⁾		
2 N.O. and 2 N.C.			440T-MS2097Axx ⁽¹⁾		
Triple Key Out	24V DC	4 N.O.	20 A	440T-MS2097Gxx ⁽¹⁾	
		2 N.O. and 2 N.C.		440T MS2097Jxx ⁽¹⁾	
		4 N.O.		440T-MS3417Dxxx ⁽¹⁾	
		2 N.O. and 2 N.C.		440T-MS3417Axxx ⁽¹⁾	
Quad Key Out	24V DC	4 N.O.	20 A	440T-MS3417Gxxx ⁽¹⁾	
		2 N.O. and 2 N.C.		440T-MS3417Jxxx ⁽¹⁾	
		4 N.O.		440T-MS3418Dxxxx ⁽¹⁾	
		2 N.O. and 2 N.C.		440T MS3418Axxxx ⁽¹⁾	
Quad Key Out	24V DC	4 N.O.	32 A	440T-MS3418Gxxxx ⁽¹⁾	
		4 N.O.		440T-MS34 18Jxxxx ⁽¹⁾	

(1) Substitute the desired primary code for x (key not included). See [Key Coding on page 98](#) for code selection.

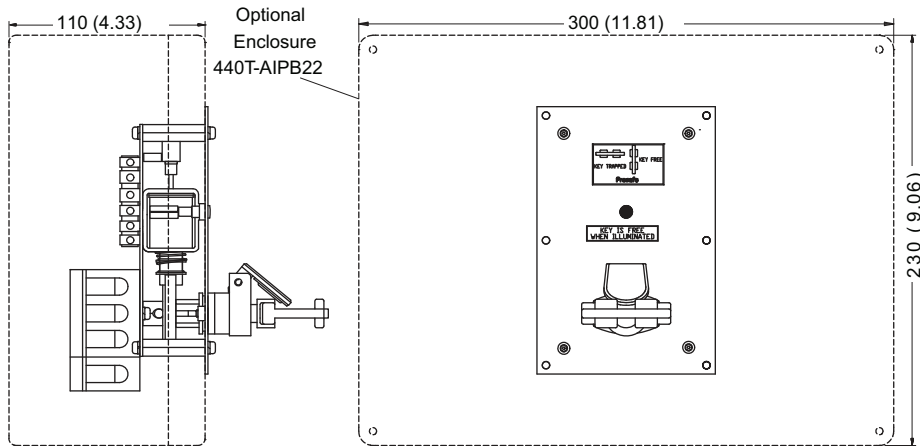
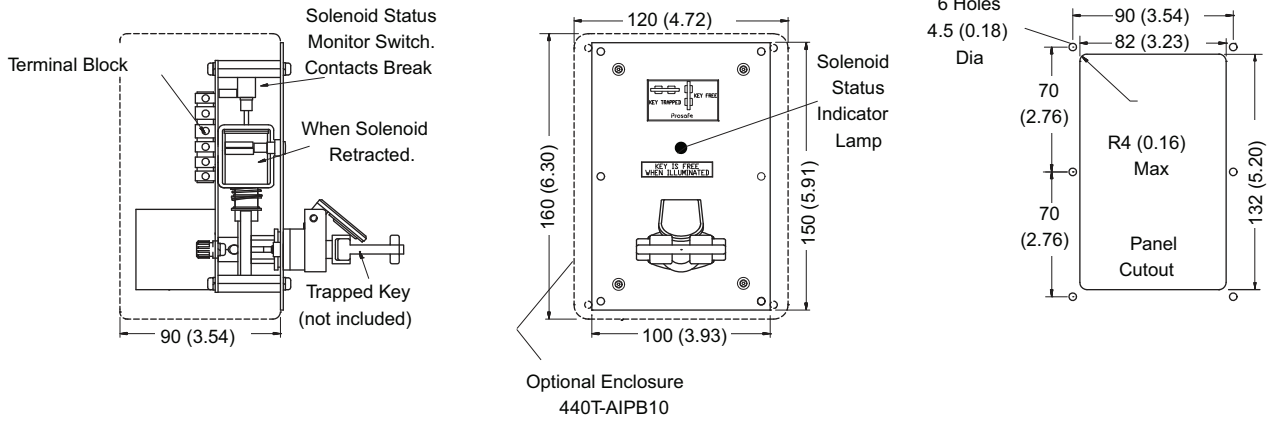
Accessories

Description	Additional Information	Cat. No.
Stainless steel key	See Accessories on page 132 .	440T-AKEYE10x ⁽¹⁾
Stainless steel replacement code barrel for products other than 100 A RPS/RKS units		440T-ASCBET4x ⁽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

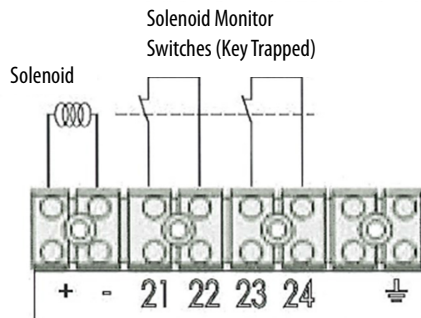
(1) Substitute the desired primary code for x (key not included). See [Key Coding on page 98](#) for code selection.

Approximate Dimensions

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



Typical Wiring Diagram



Electronic Timed-delay Units

The trapped keyswitch 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 rok.auto/certifications
Solenoid voltage	24V DC, 110V AC, 230V AC
Shear force to key, max	15.1 kN (3394.62 lbf)
Torque to key, max	14 N•m (10.33 lb•ft)
Operating temperature	0...40° C (32...104° F)
Relative humidity	95%
Material	<ul style="list-style-type: none"> • 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. (1)
Single key out panel mounted	24V DC	3 N.O. 40 A	1 N.O. 20 A	440T-MSTUE10x ⁽²⁾
		2 N.O. 20 A	1 N.O. 20 A	440T-MSTUE11x ⁽²⁾
	110V AC	3 N.O. 40 A	1 N.O. 20 A	440T-MSTUE20x ⁽²⁾
		2 N.O. 20 A	1 N.O. 20 A	440T-MSTUE22x ⁽²⁾
	230V AC	3 N.O. 40 A	1 N.O. 20 A	440T-MDTUE30x ⁽²⁾
		2 N.O. 20 A	1 N.O. 20 A	440T-MSTUE33x ⁽²⁾
Dual key out panel mounted	24V DC	3 N.O. 40 A	1 N.O. 20 A	440T-MDTUE10xx ⁽²⁾
		2 N.O. 20 A	1 N.O. 20 A	440T-MDTUE11xx ⁽²⁾
	110V AC	3 N.O. 40 A	1 N.O. 20 A	440T-MDTUE20xx ⁽²⁾
		2 N.O. 20 A	1 N.O. 20 A	440T-MDTUE22xx ⁽²⁾
	230V AC	3 N.O. 40 A	1 N.O. 20 A	440T-MDTUE30xx ⁽²⁾
		2 N.O. 20 A	1 N.O. 20 A	440T-MDTUE33xx ⁽²⁾

(1) See publication [440T-IN016](#) for safety relay connection and switch setting details.
 (2) Substitute the desired primary code for x (key not included). See [Key Coding on page 98](#) for code selection.

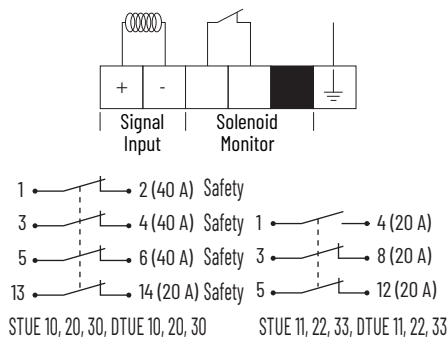
Accessories

Description	Additional Information	Cat. No.
Stainless steel key	See Accessories on page 132 .	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 98](#) for code selection.

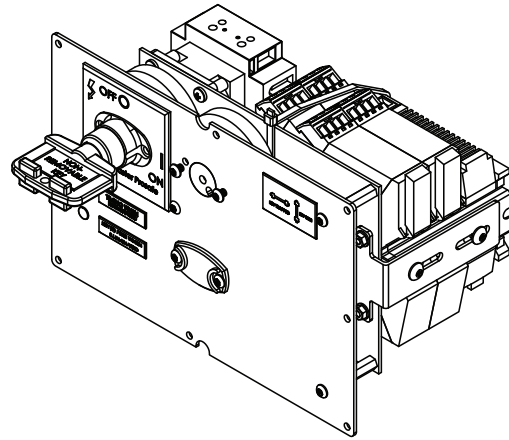
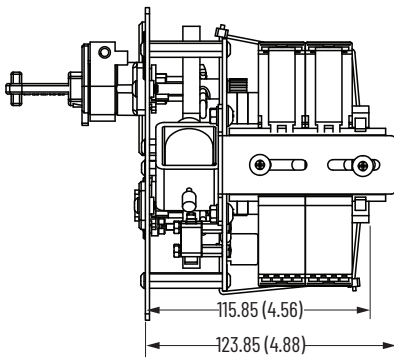
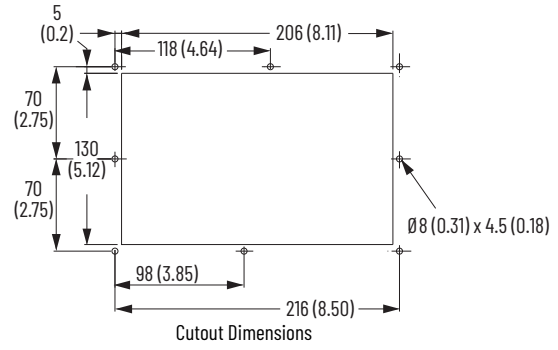
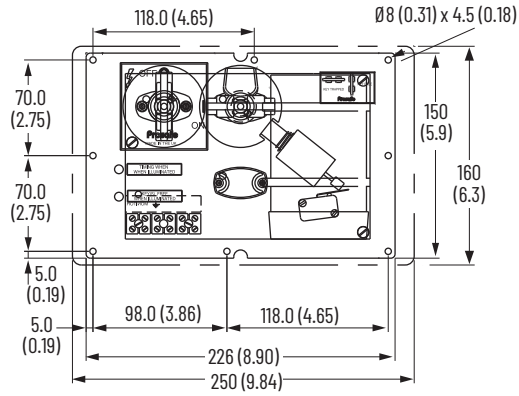
Wiring

Figure 53 - Wiring Diagram (Shown with Power On)



Approximate Dimensions

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



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 rok.auto/certifications
Operating temperature	0...40 °C (32...104 °F)
Relative humidity	95%
Mechanical life	200,000 operations
Shear force to key	15.1 kN (3394.62 lbf)
Torque to key	14 N•m (10.33 lb•ft)
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 options	24V DC (6.5 W), 110V AC, and 230V AC (9V A)
Time delay	0.1 second...40 minutes
Zero speed sensors	2x inductive sensors

Product Selection

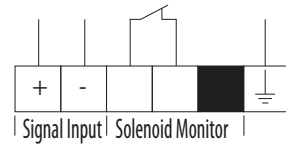
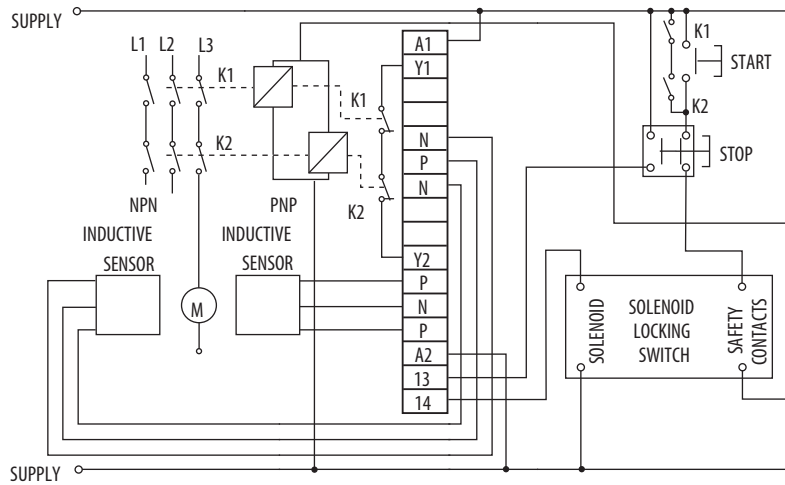
Type	Solenoid Voltage	Contact Set 1	Contact Set 2	Cat. No.
Single key out panel mounted	24V DC	3 N.O. 40 A	1 N.O. 20 A	440T-MSMSE10
		2 N.O. 20 A	1 N.C. 20 A	440T-MSMSE11
	110V AC	3 N.O. 40 A	1 N.O. 20 A	440T-MSMSE20
		2 N.O. 20 A	1 N.C. 20 A	440T-MSMSE22
	230V AC	3 N.O. 40 A	1 N.O. 20 A	440T-MSMSE30
		2 N.O. 20 A	1 N.C. 20 A	440T-MSMSE33
Dual key out panel mounted	24V DC	3 N.O. 40 A	1 N.O. 20 A	440T-MDMSE10
		2 N.O. 20 A	1 N.C. 20 A	440T-MDMSE11
	110V AC	3 N.O. 40 A	1 N.O. 20 A	440T-MDMSE20
		2 N.O. 20 A	1 N.C. 20 A	440T-MDMSE22
	230V AC	3 N.O. 40 A	1 N.O. 20 A	440T-MDMSE30
		2 N.O. 20 A	1 N.C. 20 A	440T-MDMSE33

Accessories

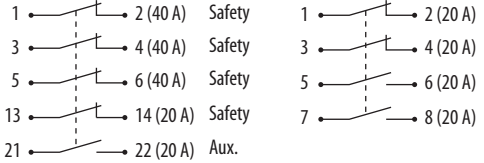
Description	Size	Type	Additional Information	Cat. No.
Stainless steel key	-	-	See Accessories on page 132 .	440T-AKEYE10x ⁽¹⁾
Stainless steel replacement code barrel for products other than 100 A RPS/RKS units				440T-ASCBE14x ⁽¹⁾
Stainless steel weatherproof replacement dust cap				440T-ASFC10x ⁽¹⁾
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, 3-wire, DC	12 mm (0.47 in.)	NPN	-	872C-M4BN12-E2
		PNP		872C-D3NP12-E2
	18 mm (0.71 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 98](#) for code selection.

Wiring and Switch Diagrams

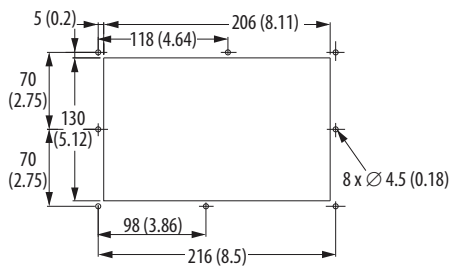
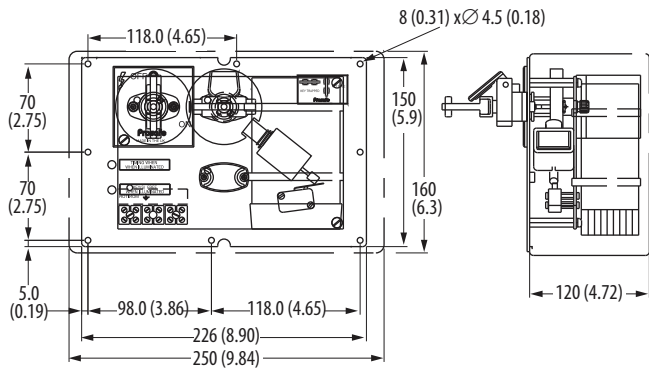


SMSE 10, 20, 30 DMSE 10, 20, 30 SMSE 11, 22, 33 DMSE 11, 22, 33



Approximate Dimensions

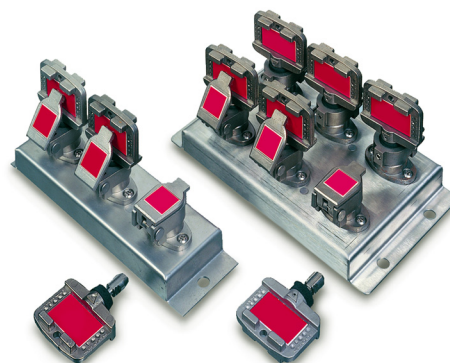
Dimensions are shown in mm (in.). Dimensions are not intended to be used for installation purposes.



Key Exchange Units

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

- A range of standard 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

Attribute	Value
Standards Classification (Safety)	EN ISO 14119 and GS-ET-31, and can be used in safety application up to category 3, PLd in accordance with EN ISO 13849-1, and in the application area of EN 60204-1.
Functional Safety Data	PFHD = 1.00E-7 (probability of dangerous failure per hr); T1 = 20 (Proof test interval)
Certifications	CE Marked for all applicable directives, and TÜV Certified, see rok.auto/certifications
Operating temperature	-40...+80 °C (-40...+176 °F)
Relative humidity	95%
Mechanical life	200,000 operations
Shear force to key, max	15.1 kN (3394.62 lbf)
Torque to key, max	14 N•m (10.33 lb•ft)
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⁾
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⁾

Number of Keys	Keys In and Out	Cat. No.
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 15 key 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 23 key out	440T-MKEXE39 ⁽¹⁾
25 way	1 key in 24 key out	440T-MKEXE40 ⁽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 98](#) for code selection.

Accessories

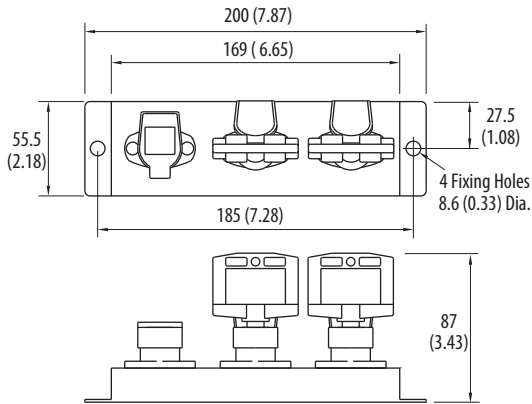
Description	Additional Information	Cat. No.
Stainless steel key	See Accessories on page 132 .	440T-AKEYE10x ⁽¹⁾
Stainless steel replacement code barrel for products other than 100 A RPS/RKS units		440T-ASCBE14x ⁽¹⁾
Stainless steel weatherproof replacement dust cap		440T-ASFC10x ⁽¹⁾

(1) Substitute the desired primary code for x (key not included). See [Key Coding on page 98](#) for code selection.

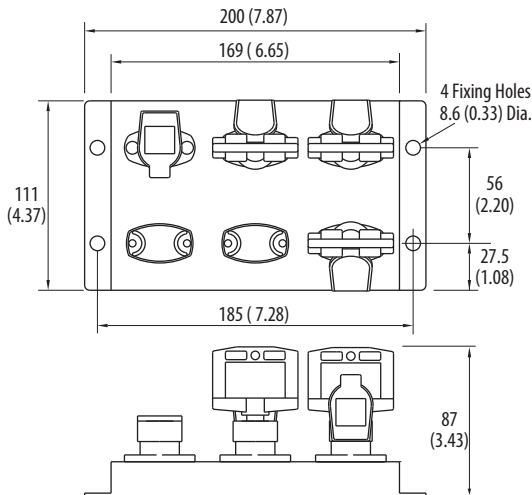
Approximate Dimensions

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

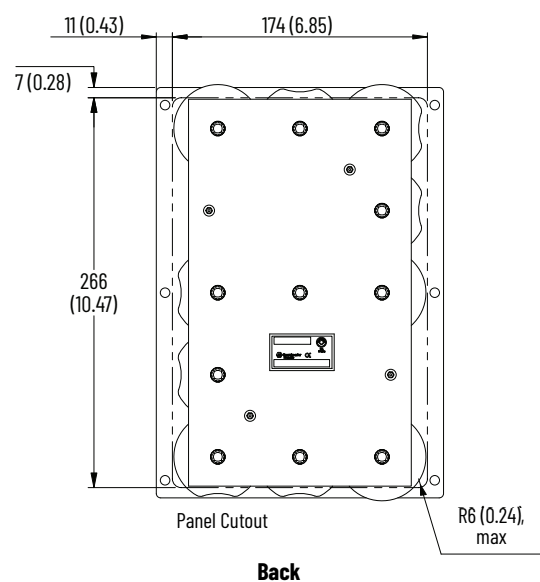
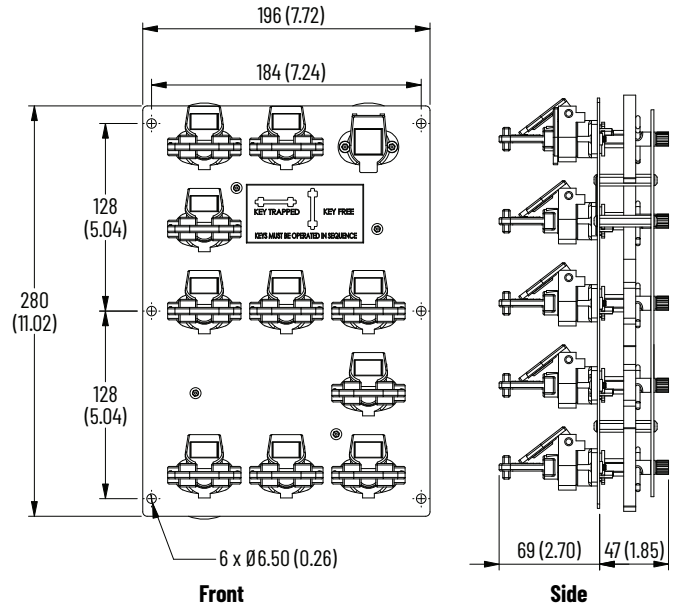
2- or 3-way Key Exchange Unit



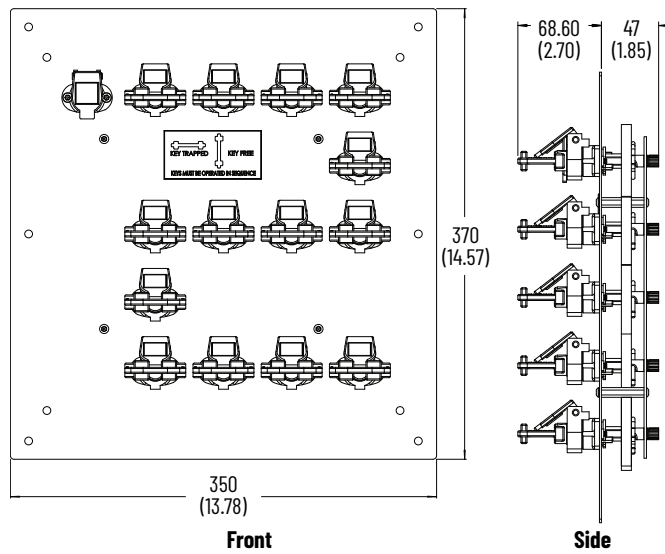
4-, 5-, or 6-way Key Exchange Unit



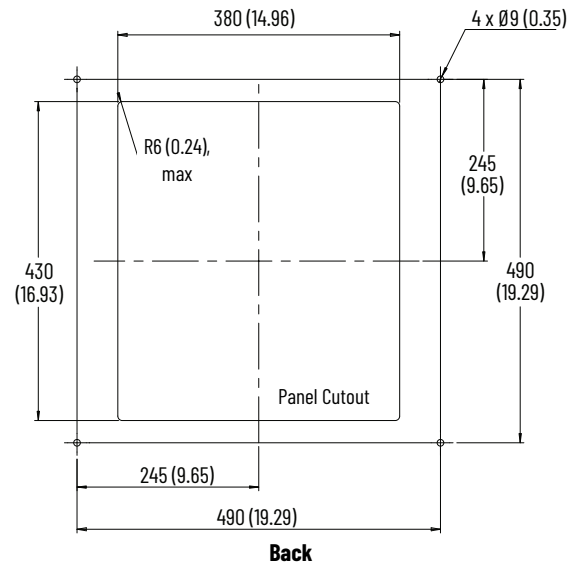
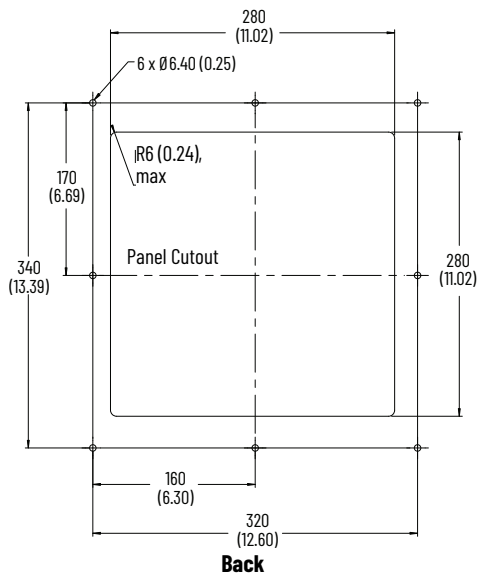
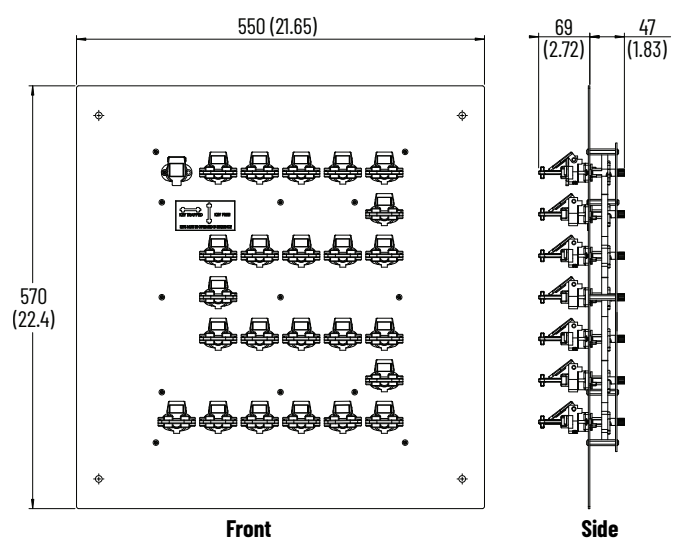
7-...11-way Units



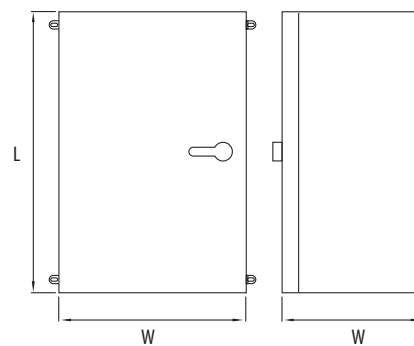
12-...15-way Units



16-...25-way Units



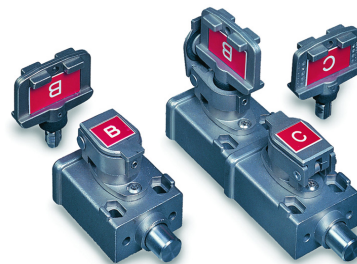
Key Exchange Cabinets (Painted Mild Steel or Stainless Steel)



Bolt Interlocks

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

Table 53 - Mechanical

Attribute	Value
Standards Classification (Safety)	EN ISO 14119 and GS-ET-31, and can be used in safety application up to category 3, PLd in accordance with EN ISO 13849-1, and in the application area of EN 60204-1.
Functional Safety Data	PFHD = 1.00E-7 (probability of dangerous failure per hr); T1 = 20 (Proof test interval)
Certifications	CE Marked for all applicable directives, and TÜV Certified, see rok.auto/certifications
Operating temperature	-40...+80 °C (-40...+176 °F)
Relative humidity	95%
Mechanical life	200,000 operations
Shear force to key, max	15.1 kN (3394.62 lbf)
Torque to key, max	14 N•m (10.33 lb•ft)
Material	Faceplate: 316L stainless steel
Mounting	SBL <ul style="list-style-type: none"> • 2 x M5 counterbored from top • 2 x M5 from underside with M5 nuts DBL <ul style="list-style-type: none"> • 4 x M5 counterbored from top • 4 x M5 from underside with M5 nuts
Bolt diameter	15 mm (0.59 in)

Table 54 - Electrical/Solenoid

Attribute	Value
Standards Classification (Safety)	EN ISO 14119 and GS-ET-31, and can be used in safety application up to category 3, PLd in accordance with EN ISO 13849-1, and in the application area of EN 60204-1.
Functional Safety Data	PFHD = 1.00E-7 (probability of dangerous failure per hr); T1 = 20 (Proof test interval)
Certifications	CE Marked for all applicable directives, and TÜV Certified, see rok.auto/certifications
Safety contacts	2 N.C. positive break
Designation/utilization category	A300/AC-15 (Ue/Ie) 240V/3 A, 120V/6 A N300/DC-13 (Ue/Ie) 250V/1.1 A, 125V/2.2 A
Thermal current	10 A
Current, min	5V 5 mA DC
Auxiliary contacts	1 N.O.
Ingress protection rating	IP67
Shear force to key, max	15.1 kN (3394.62 lbf)
Torque to key, max	14 N•m (10.33 lb•ft)
Operating temperature	-40...+80 °C (-40...+176 °F)
Mechanical life	200,000 operations
Electrical life	Dependent on load
Torque settings, max	<ul style="list-style-type: none"> • Lid screws: 0.55 N•m (4.87 lb•in) • Terminal screws: 1.0 N•m (8.85 lb•in)

Product Selection

Table 55 - 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-MDBLE11xxx ⁽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-MQBLE14xxyy ⁽¹⁾⁽²⁾
		3 (0.11)	17 (0.66)	440T-MQBLE15xxyy ⁽¹⁾⁽²⁾
		6 (0.23)	20 (0.78)	440T-MQBLE16xxyy ⁽¹⁾⁽²⁾
		13 (0.51)	27 (1.06)	440T-MQBLE17xxyy ⁽¹⁾⁽²⁾

(1) Substitute the desired primary code for x (key not included). See [Key Coding on page 98](#) for code selection.

(2) Substitute the desired secondary code for y (key not included). See [Key Coding on page 98](#) for code selection.

Table 56 - 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 98](#) for code selection.
 (2) Substitute the desired secondary code for y (key not included). See [Key Coding on page 98](#) for code selection.

Table 57 - 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 98](#) for code selection.
 (2) Substitute the desired secondary code for y (key not included). See [Key Coding on page 98](#) for code selection.

Accessories

Description	Additional Information	Cat. No.
Stainless steel key	See Accessories on page 132 .	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⁾
Stainless steel ejector key		440T-AKEYE13x ⁽¹⁾

(1) Substitute the desired primary code for x (key not included). See [Key Coding on page 98](#) for code selection.

Approximate Dimensions

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

Figure 54 - Single Key

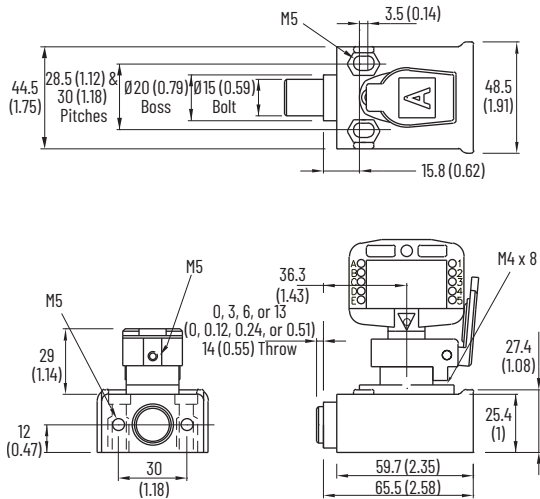


Figure 56 - Triple Key

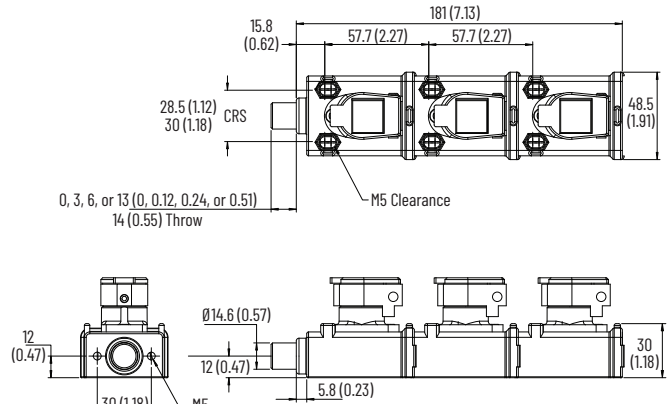


Figure 55 - Dual Key

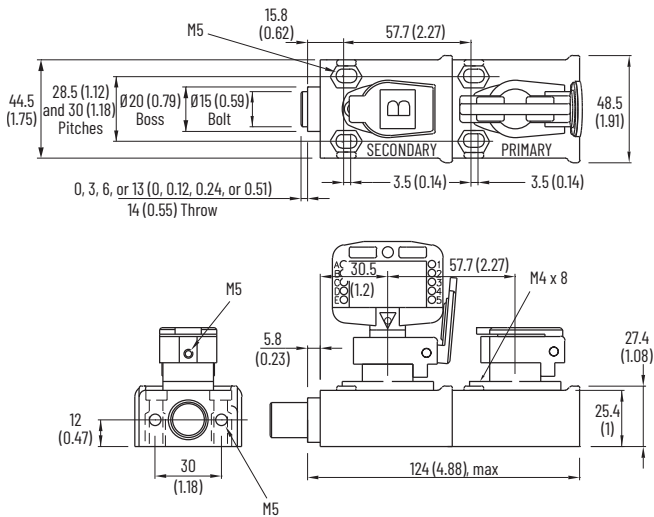


Figure 57 - Quad Key

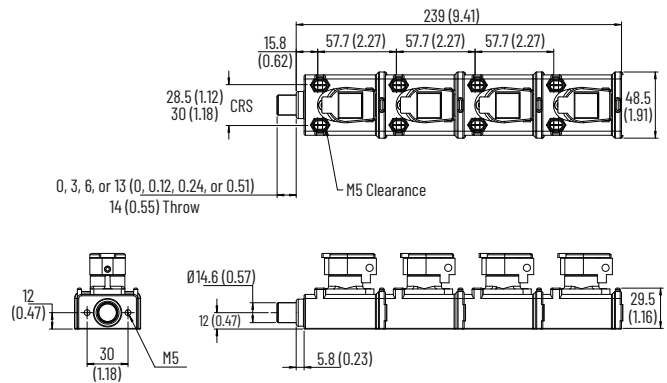


Figure 58 - Prosafe Boltlock with Electrical Isolation – One Key

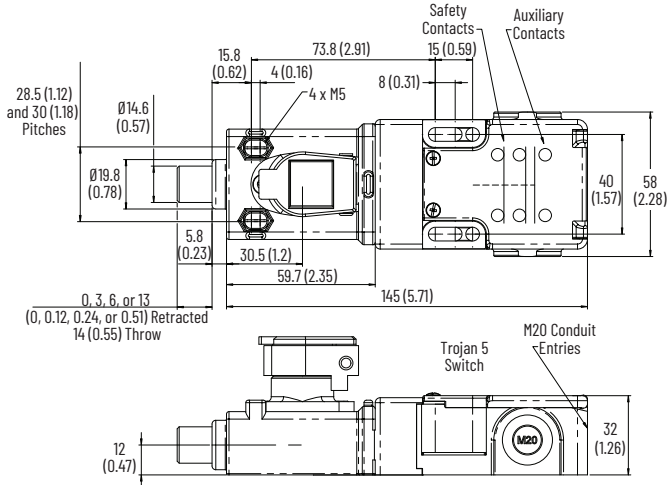


Figure 61 - Prosafe Boltlock Solenoid Locked with Electrical Isolation – Two Keys

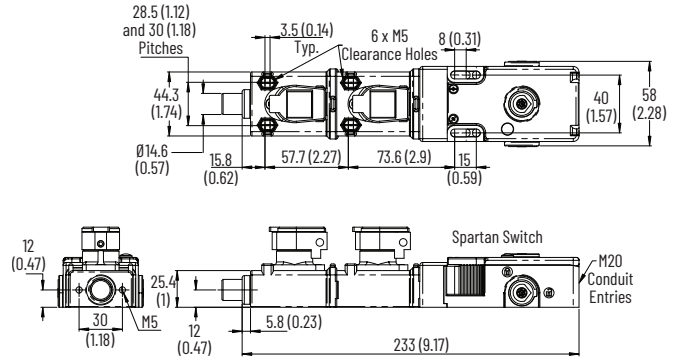


Figure 59 - Prosafe Boltlock with Electrical Isolation – Two Keys

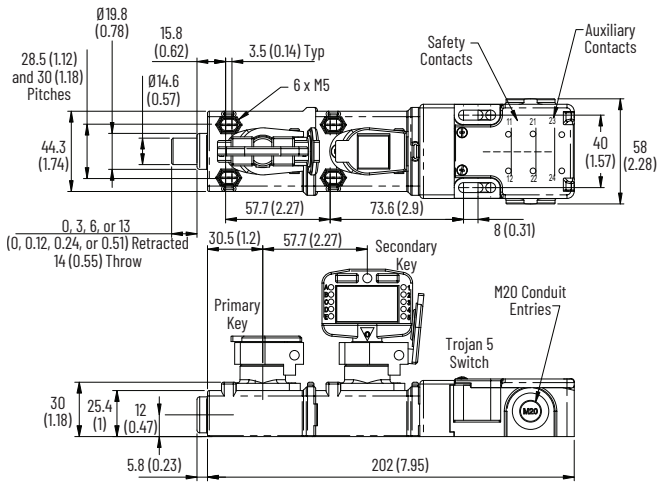
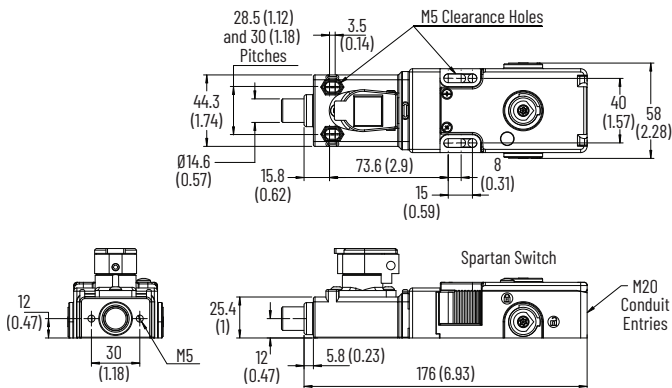


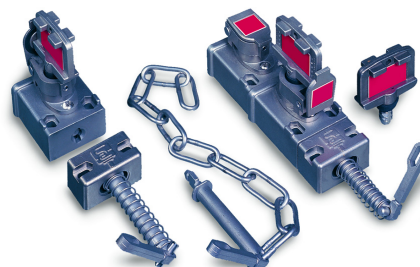
Figure 60 - Prosafe Boltlock Solenoid Locked with Electrical Isolation – One Key



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
- Lever or chain actuator
- Stainless steel dust cap as standard
- Replaceable code barrel assembly
- Solenoid and electric versions
- Multiple key options



Specifications

Attribute	Value
Standards Classification (Safety)	EN ISO 14119 and GS-ET-31, and can be used in safety application up to category 3, PLd in accordance with EN ISO 13849-1, and in the application area of EN 60204-1.
Functional Safety Data	PFHD = 1.00E-7 (probability of dangerous failure per hr); T1 = 20 (Proof test interval)
Certifications	CE Marked for all applicable directives, and TÜV Certified, see rok.auto/certifications
Operating temperature	-40...+80 °C (-40...+176 °F)
Relative humidity	95%
Mechanical life	200,000 operations
Shear force to key	15.1 kN (3394.62 lbf)
Torque to key	14 N•m (10.33 lb•ft)
Material	Faceplate: 316L stainless steel
Mounting	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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

Table 58 - 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 ⁽¹⁾⁽²⁾
		Both keys trapped to release lever	440T-MDALE11xx ⁽¹⁾
	Chain	Primary key trapped, secondary key free to release chain	440T-MDCLE10xy ⁽¹⁾⁽²⁾
		Both keys trapped to release chain	440T-MDCLE11xx ⁽¹⁾
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⁾⁽²⁾
Quad Key	Lever	One primary trapped, three secondary keys free to release lever	440T-MQALE11x ⁽¹⁾
Five-way	Lever	One primary trapped, four secondary keys free to release lever	440T-MPALE11x ⁽¹⁾
	Ejector key		440T-MPALJ11x ⁽¹⁾

(1) Substitute the desired primary code for x (key not included). See [Key Coding on page 98](#) for code selection.

(2) Substitute the desired secondary code for y (key not included). See [Key Coding on page 98](#) for code selection.

Table 59 - 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⁾
Solenoid		Lever	Primary key trapped, secondary key free to release lever	440T-MDAUE20x ⁽¹⁾

(1) Substitute the desired primary code for x (key not included). See [Key Coding on page 98](#) for code selection.

(2) Substitute the desired secondary code for y (key not included). See [Key Coding on page 98](#) for code selection.

Accessories

Description	Additional Information	Cat. No.
Stainless steel key	See Accessories on page 132 .	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 98](#) for code selection.

Approximate Dimensions

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

Figure 62 - Mechanical, Single Key, Lever Actuator

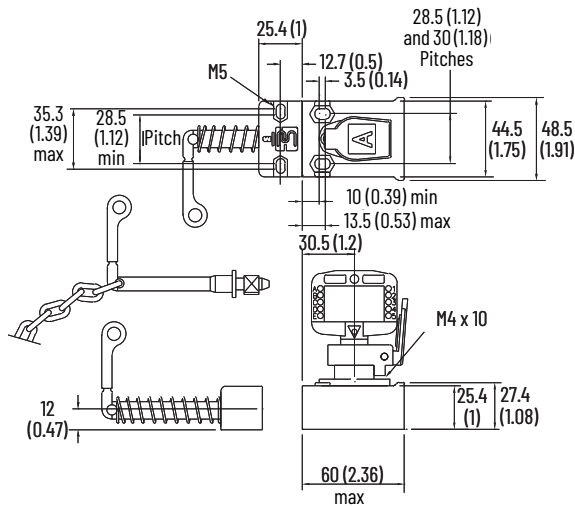


Figure 65 - Electrical, Dual Key, Lever Actuator

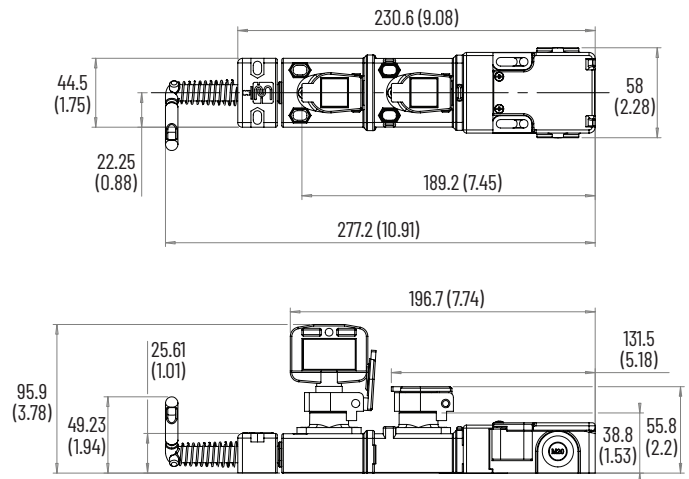


Figure 63 - Mechanical, Dual Key, Lever Actuator

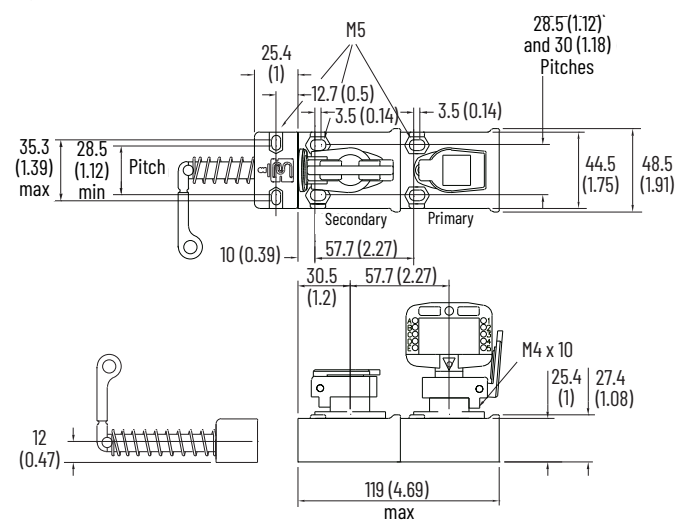


Figure 66 - Solenoid, Dual Key, Lever Actuator

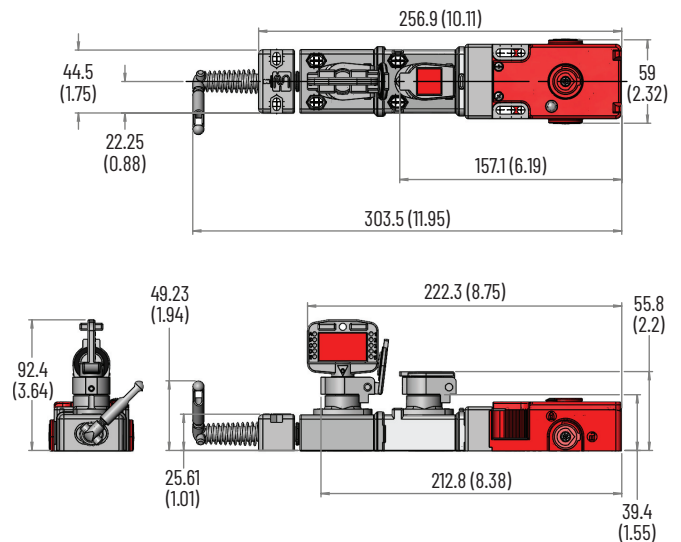
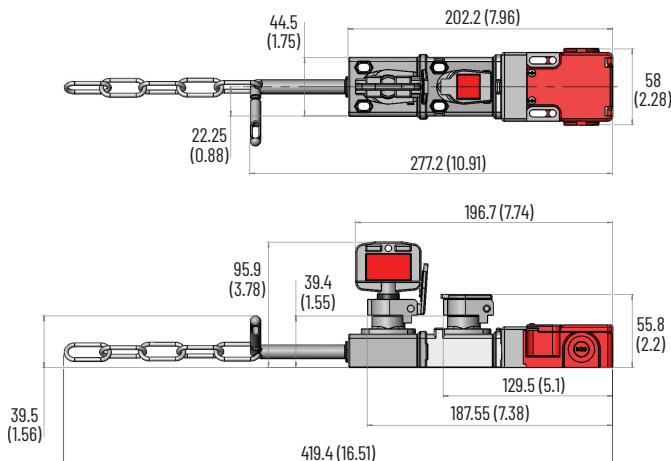


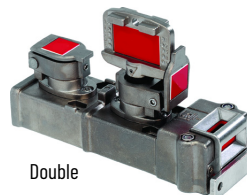
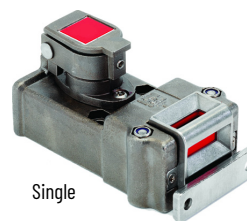
Figure 64 - Electrical, Dual Key, Chain Actuator



Prosafe Slamlock Mechanical Interlock Switches

The Prosafe Slamlock™ 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



Specifications

Attribute	Value
Standards Classification (Safety)	EN ISO 14119 and GS-ET-31, and can be used in safety application up to category 3, PLD in accordance with EN ISO 13849-1, and in the application area of EN 60204-1.
Functional Safety Data	PFHD = 1.00E-7 (probability of dangerous failure per hr); T1 = 20 (Proof test interval)
Certifications	CE Marked for all applicable directives, and TÜV Certified, see rok.auto/certifications
Operating temperature	-40...+80 °C (-40...+176 °F)
Relative humidity	95%
Mechanical life	200,000 operations
Shear force to key, max	15.1 kN (3394.62 lbf)
Torque to key, max	14 N•m (10.33 lb•ft)
Material	316L stainless steel
Mounting	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Single key: 0.76 kg (1.68 lb) • Dual key: 1.33 kg (2.93 lb)
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-MDSLE11xy ⁽¹⁾⁽²⁾
	Flat		440T-MDSLE12xy ⁽¹⁾⁽²⁾
	Standard	Both keys trapped to release actuator	440T-MDSLE20xx ⁽¹⁾
	Flexible		440T-MDSLE22xx ⁽¹⁾
	Flat		440T-MDSLE23xx ⁽¹⁾
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 98](#) for code selection.

(2) Substitute the desired secondary code for y (key not included). See [Key Coding on page 98](#) for code selection.

Accessories

Description	Additional Information	Cat. No.
Stainless steel key	See Accessories on page 132 .	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-A1112
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 98](#) for code selection.

Approximate Dimensions

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

Figure 67 - Single Key Slamlock

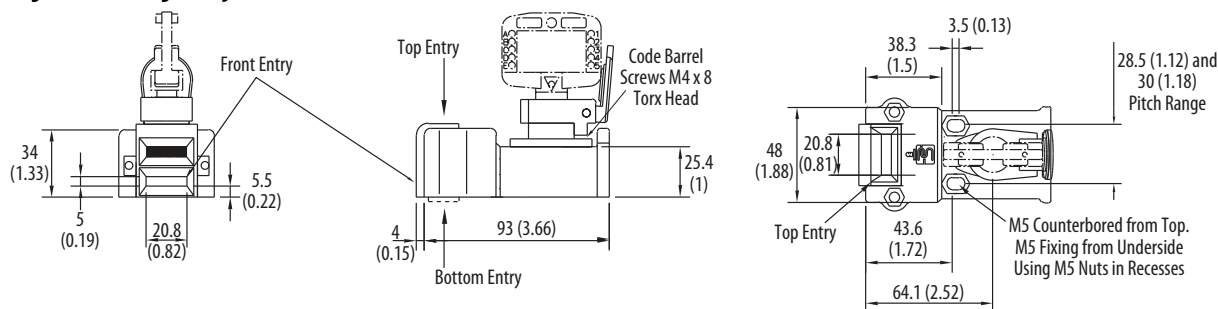


Figure 68 - Dual Key Slamlock

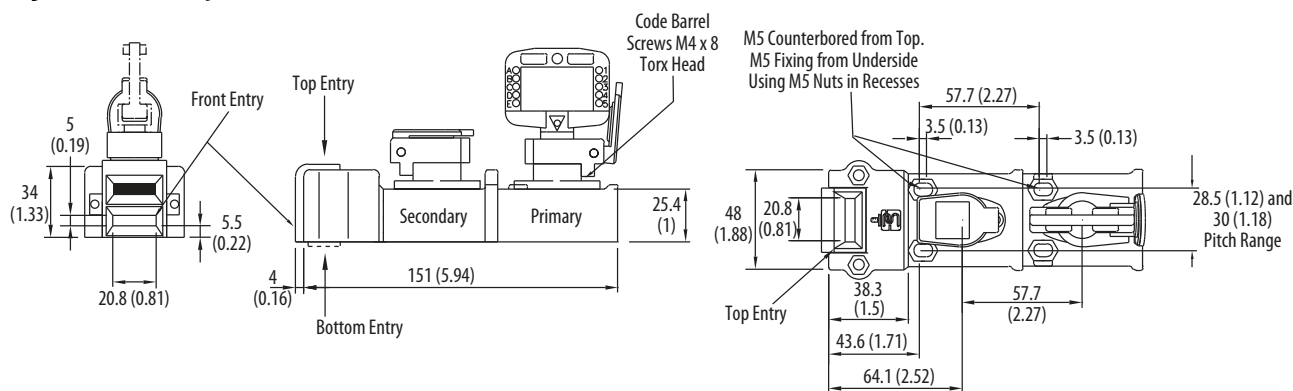
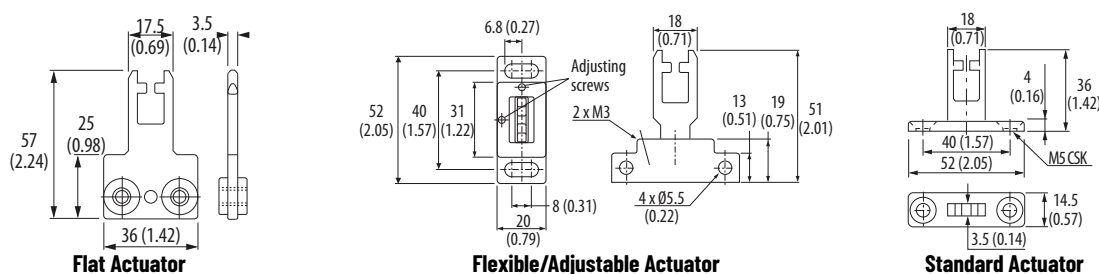


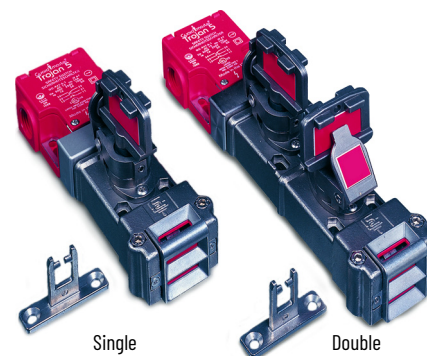
Figure 69 - Actuators



Prosafe Slamlock Electrical Interlock Switches

The Prosafe Slamlock 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 Classification (Safety)	EN ISO 14119 and GS-ET-31, and can be used in safety application up to category 3, PLd in accordance with EN ISO 13849-1, and in the application area of EN 60204-1.		
Functional Safety Data	PFHD = 1.00E-7 (probability of dangerous failure per hr); T1 = 20 (Proof test interval)		
Certifications	CE Marked for all applicable directives, and TÜV Certified, see rok.auto/certifications		
Operating temperature	-20...+80 °C (-4...+176 °F)		
Relative humidity	95%		
Mechanical life	200,000 operations		
Shear force to key, max	15.1 kN (3394.62 lbf)		
Torque to key, max	14 N•m (10.33 lb•ft)		
Case material	<ul style="list-style-type: none"> • 316L stainless steel • UL approved glass-filled polyester 		
Actuator material	Stainless steel		
Mounting	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • SSE: 1160 kg (2.6 lb) • DSSE: 1700 kg (3.7 lb) 		
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, max	500V/500V A		
Thermal current (I_{th})	10 A		
Current, min	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		
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

Table 60 - 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	Key free to release actuator	440T-MSSSE26x ⁽¹⁾		
			Flexible	440T-MSSSE27x ⁽¹⁾	
			Flat	440T-MSSSE25x ⁽¹⁾	

(1) Substitute the desired primary code for x (key not included). See [Key Coding on page 98](#) for code selection.

(2) Substitute the desired secondary code for y (key not included). See [Key Coding on page 98](#) for code selection.

Table 61 - 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 98](#) for code selection.

Accessories

Description	Additional Information	Cat. No.
Stainless steel key	See Accessories on page 132 .	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-AT1112
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 98](#) for code selection.

Approximate Dimensions

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

Figure 70 - Single Key Slamlock

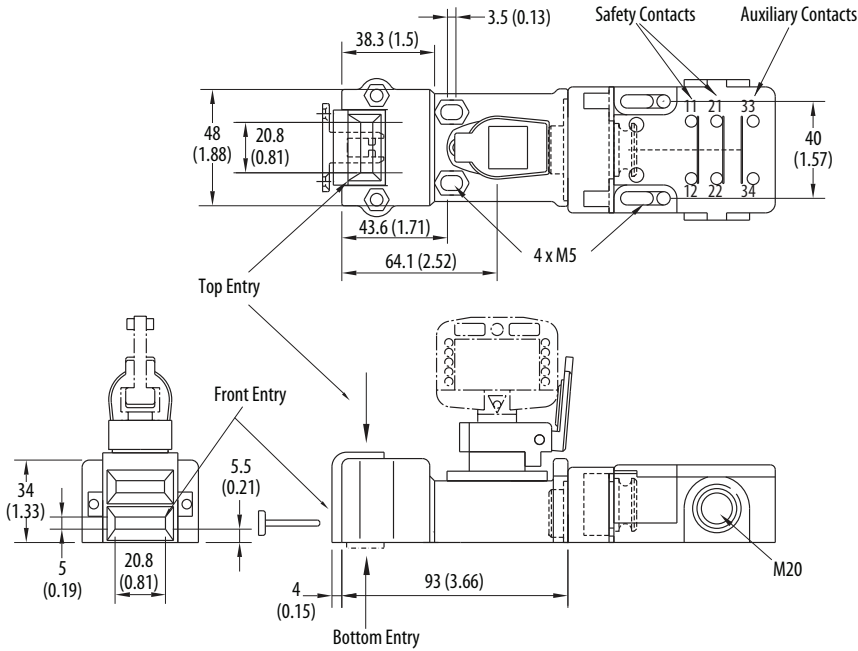
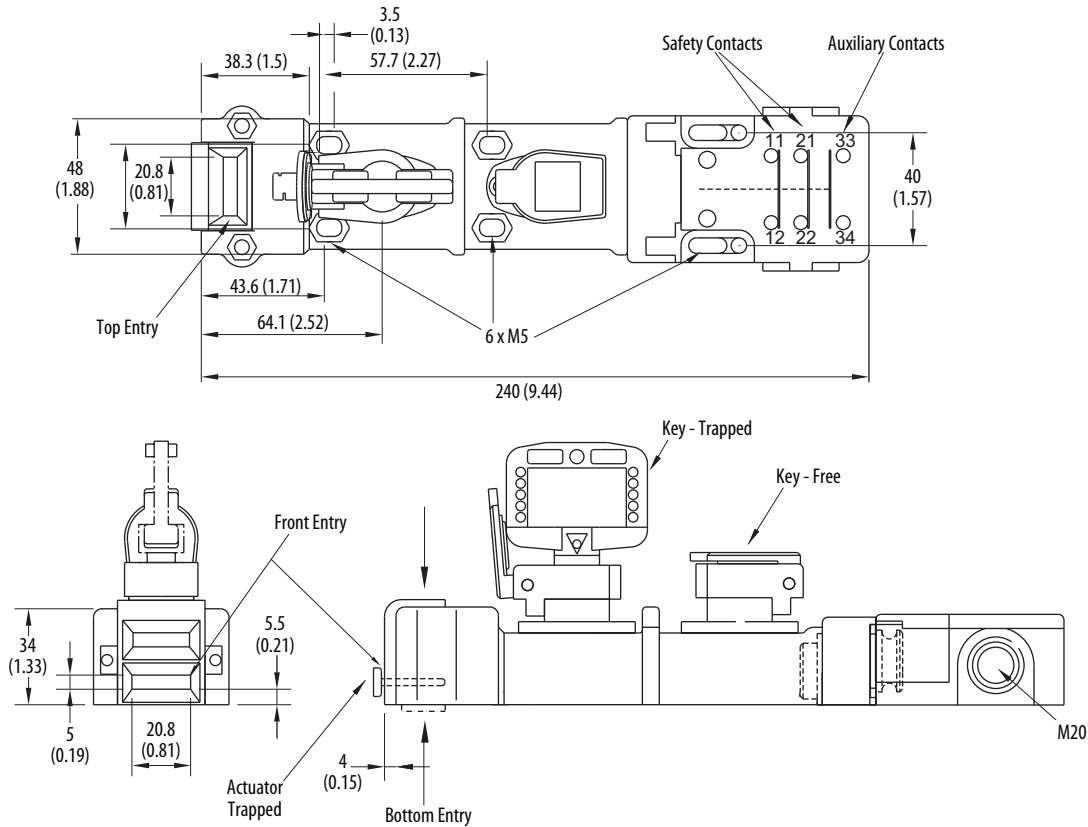


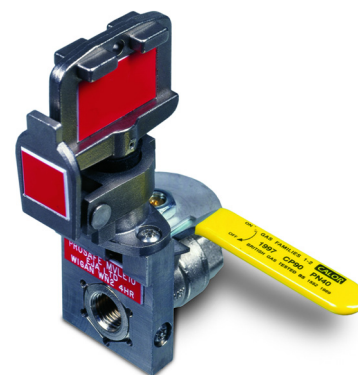
Figure 71 - Dual Key Slamlock



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...2 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 Classification (Safety)	EN ISO 14119 and GS-ET-31, and can be used in safety application up to category 3, PLD in accordance with EN ISO 13849-1, and in the application area of EN 60204-1.
Functional Safety Data	PFHD = 1.00E-7 (probability of dangerous failure per hr); T1 = 20 (Proof test interval)
Certifications	CE Marked for all applicable directives, and TÜV Certified, see rok.auto/certifications
Operating temperature	-40...+80 °C (-40...+176 °F)
Relative humidity	25...95%
Mechanical life	200,000 operations
Shear force to key, max	15.1 kN (3394.62 lbf)
Torque to key, max	14 N•m (10.33 lb•ft)
Pressure, max	2100 KPa
Material	316L stainless steel

Product Selection

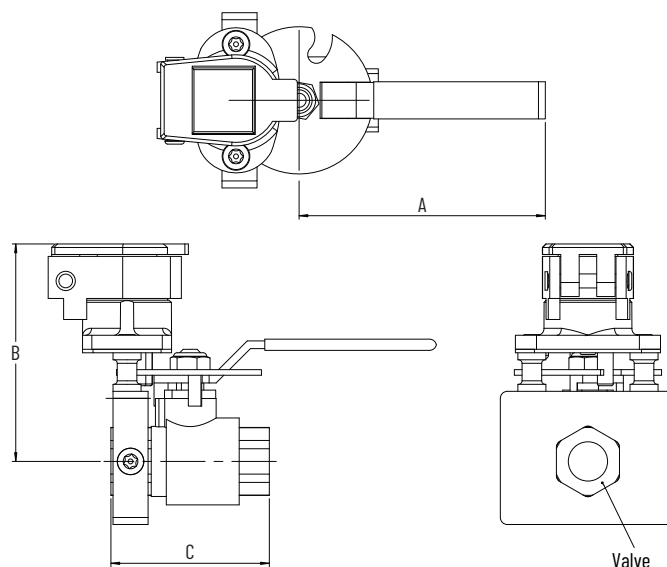
Valve Size—Inch BSP ⁽¹⁾	Valve Status	Cat. No. ⁽²⁾
0.25	Key free/valve locked closed	440T-VMVLE10x
0.375		440T-VMVLE11x
0.5		440T-VMVLE12x
0.25	Key free/valve locked open	440T-VMVLE13x
0.375		440T-VMVLE14x
0.5		440T-VMVLE15x
1.0	Key free/valve locked closed	440T-VMVLE18x
	Key free/valve locked open	440T-VMVLE19x

(1) BSP = British standard pipe threads

(2) Substitute the desired primary code for x (key not included). See [Key Coding on page 98](#) for code selection.

Approximate Dimensions

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



Cat. No.	[mm (in.)]			Valve Size	Pressure [bar (kg/cm ²)]
	A	B	C		
440T-VMVLE10	70 [2.75]	62 [2.44]	45 [1.77]	0.25 in. BSP	40
440T-VMVLE11			47 [1.85]	0.375 in. BSP	50
440T-VMVLE12	96 [3.78]	64 [2.52]	62 [2.44]	0.5 in. BSP	40
440T-VMVLE13	70 [2.75]	62 [2.44]	45 [1.77]	0.25 in. BSP	40
440T-VMVLE14			47 [1.85]	0.375 in. BSP	50
440T-VMVLE15	96 [3.78]	64 [2.52]	62 [2.44]	0.5 in. BSP	40
440T-VMVLE18	110 [4.33]	71 [2.79]	84 [3.31]	1 in. BSP	40
440T-VMVLE19					
440T-VMVLE20	162 [6.38]	96 [3.78]	125 [4.92]	2 in. BSP	40
440T-VMVLE21					

Switchgear Adapters

The trapped key switchgear adapters have the following feature:

- Lower maintenance cost



Specifications

Attribute	Value
Standards Classification (Safety)	EN ISO 14719 and GS-ET-31, and can be used in safety application up to category 3, PLd in accordance with EN ISO 13849-1, and in the application area of EN 60204-1.
Functional Safety Data	PFHD = 1.00E-7 (probability of dangerous failure per hr); T1 = 20 (Proof test interval)
Certifications	CE Marked for all applicable directives, and TÜV Certified, see rok.auto/certifications
Operating temperature	-10...+50 °C (14...122 °F)
Mechanical life	200,000 operations
Shear force to key, max	15.1 kN (3394.62 lbf)
Torque to key, max	14 N·m (10.33 lb·ft)
Relative humidity	95%
Weight [kg (lb)]	316L stainless steel
Mounting	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 your local Allen-Bradley distributor or Rockwell Automation sales office.)

Product Selection (3/8 sq shaft)

Mounting	Trap Direction	Cat. No.
2 x M4	65° clockwise to trap	440T-MSGAU10
	65° counterclockwise to trap	440T-MSGAU11
	90° clockwise to trap	440T-MSGAU12
	90° counterclockwise to trap	440T-MSGAU13
	±90° counterclockwise to trap	440T-MSGAU14
	45° clockwise to trap	440T-MSGAU17
	45° counterclockwise to trap	440T-MSGAU18
	90° clockwise to trap	440T-MSGAU19
	90° counterclockwise to trap	440T-MSGAU20
	90° clockwise to trap	440T-MSGAU21
	90° clockwise to trap	440T-MSGAU23

Accessories

Description	Additional Information	Cat. No. (1)
Stainless steel key		440T-AKEYE10x
Stainless steel replacement code barrel for products other than 100 A RPS/RKS units	See Accessories on page 132 .	440T-ASCBE14x
Stainless steel weatherproof replacement dust cap		440T-ASFCT10x

(1) Substitute the desired primary code for x (key not included). See [Key Coding on page 98](#) 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.

Approximate Dimensions

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

Figure 72 - 440T-MSGAU1x and 440T-MSGAU22x

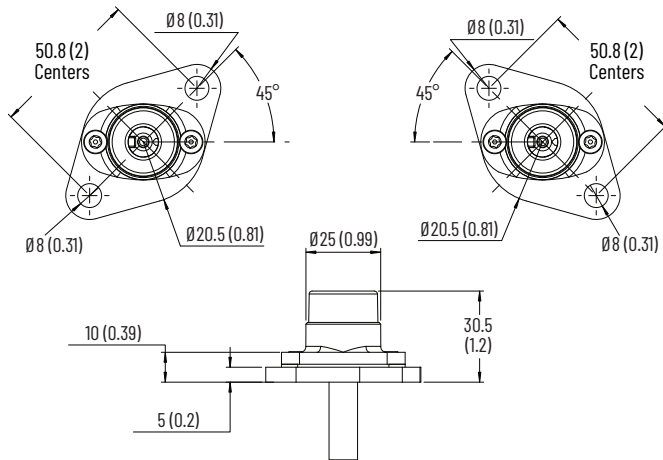


Figure 74 - 440T-MSGAU21x

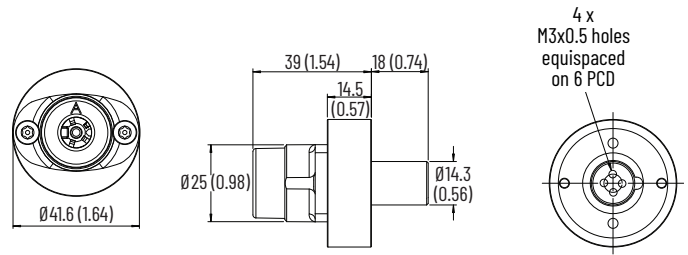


Figure 75 - 440T-MSGAU23x

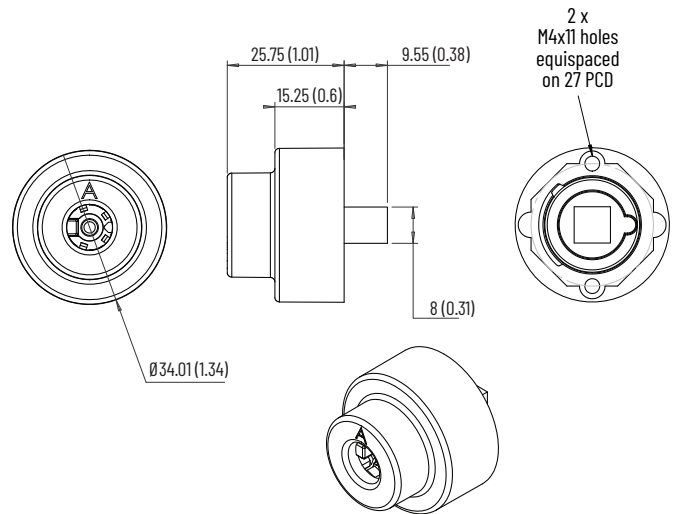
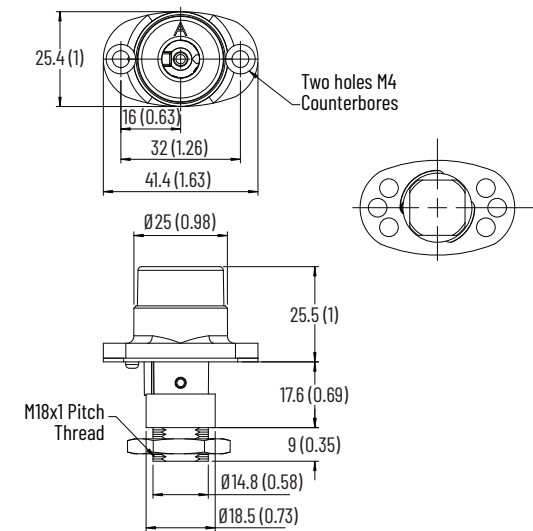

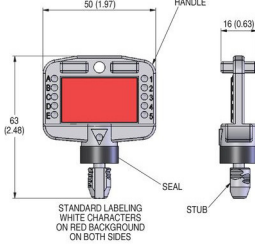

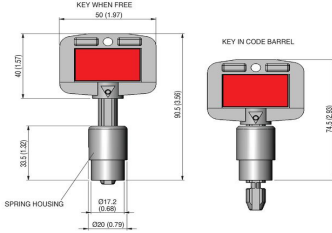

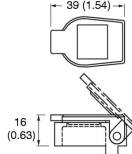

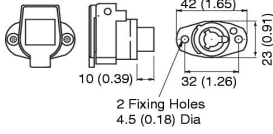

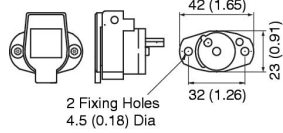



Figure 73 - 440T-MSGAU20x



Accessories

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

(1) Substitute the desired primary code for x (key not included). See [Key Coding on page 98](#) for code selection.

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

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Technical Support Center	Find help with how-to videos, FAQs, chat, user forums, and product notification updates.	rok.auto/support
Knowledgebase	Access Knowledgebase articles.	rok.auto/knowledgebase
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Product Compatibility and Download Center (PCDC)	Download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes.	rok.auto/pcdc

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