

Safety Switches
Tongue Switches
Cadet™ 3



Description

The Cadet 3 is a tongue-operated (or key-operated) safety interlock switch designed to fit at the leading edge of sliding, hinged or lift-off guards. With its dual entry slots and rotatable head, the versatile Cadet 3 can offer up to eight different actuator entry options. The unique compact housing (90.5 x 31 x 30.4 mm (3.56 x 1.22 x 1.19 in)) has industry standard DIN 50047 fixing centers for ease of mounting.

Operation of the switch is achieved through the insertion of a specially-profiled stainless-steel key that is permanently mounted to the guard door. A semi-flexible key allows the Cadet 3 to be used on small-radius doors (60 mm or 2.36 in).

Available with a variety of contact configurations, the Cadet 3 is sealed to IP67. A blanking plug is supplied for the unused key entry.

Features

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

Specifications

Safety Ratings

Standards	EN 954-1, ISO 13849-1, IEC /EN 60204-1, NFPA 79, EN 1088, ISO 14119, IEC / EN 60947-5-1, ANSI B11.19, AS 4024.1
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Safety Classification	Cat. 1 Device per EN 954-1 Dual-channel interlocks suitable for Cat. 3 or 4 systems
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Functional Safety Data *	B10d: > 2×10^6 operations at min. load PFH _d : > 3×10^{-7} MTTF _d : > 385 years Dual channel interlock may be suitable for performance levels P1e or P1d (according to ISO 13849-1:2006) and for use in SIL 2 or SIL 3 systems (according to IEC 62061) depending on application characteristics
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Certifications	CE marked for all applicable directives, cULus, TÜV, and CCC
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Outputs

Safety Contacts [†] Direct Opening Action	2 N.C.	3 N.C.
Auxiliary Contacts	1 N.O.	None
Thermal Current/ _{th}	10 A	
Rated Insulation Voltage	(Ui) 500V	
Switching Current @ Voltage, Min.	5 mA @ 5 V DC	

Utilization Category

A 600/AC-15	(Ue) 600V (le) 1.2 A	500V 1.4 A	240V 3.0 A	120V 6.0 A
N 600/DC-13	(Ue) 600V (le) 0.4 A	500V 0.55 A	250V 1.1 A	125V 2.2 A

Operating Characteristics

Break Contact Force, Min.	15 N (3.37 lb)
Actuation Speed, Max.	160 mm (6.299 in) per sec
Actuation Frequency, Max.	2 cycle per sec.
Operating Radius, Min	150 mm (5.905 in) (60 mm (2.36 in) with GD 2 kit)
Operating Life @ 100 mA load	1×10^6 operations

Environmental

Enclosure Type Rating	IP 67
Operating Temperature—C (F)	-20... + 80° (-4... + 176°)

Physical Characteristics

Housing Material	UL approved glass-filled PBT
Actuator Material	Stainless Steel
Weight—g (lbs)	80 (0.176)
Color	Red

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

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

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

Product Selection

Contact			Actuator Type	Cat. No.				
Safety	Auxiliary	Action		M16 Conduit		Connectors		
				M16	1/2 inch NPT Adaptor	Connect to Distribution Box 6-Pin Micro (M12)	Connect to ArmorBlock Guard I/O 5-Pin Micro (M12)‡	
3 N.C.	—	—	Flat	440K-C 21096	440K-C 21048	440K-C 21090	440K-C 2NNFPS	
			90°	440K-C 21097	440K-C 21057	440K-C 21091	—	
			GD 2 Metal Alignment Guide with Semi-Flex Actuator	—	440K-C 21062	440K-C 21092	440K-C 2NNAPS	
			—	440K-C 21070	—	—	—	
2 N.C.	1 N.O.	BBM	Flat	440K-C 21098	440K-C 21050	440K-C 21054	—	
			90°	440K-C 21061	440K-C 21058	440K-C 21067	—	
			GD 2 Metal alignment guide with semi-flex actuator	—	440K-C 21074	440K-C 21088	—	
			—	440K-C 21055	—	—	—	
		MBB	Flat	440K-C 21052	440K-C 21093	440K-C 21060	—	
			90°	440K-C 21065	440K-C 21094	440K-C 21068	—	
			GD 2 Metal Alignment Guide with Semi-Flex Actuator	—	440K-C 21095	440K-C 21089	—	
			—	440K-C 21080	—	—	—	

§ For connector ratings see page 3-9.

‡ With a 5-pin micro (M12) connector, not all contacts are connected. See *Typical Wiring Diagram* on page 3-17 for wiring details.

Recommended Logic Interfaces

Description	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
Single-Function Safety Relays							
MSR127RP	3 N.O.	1 N.C.	Removable (Screw)	Monitored Manual	24V AC/DC	5-24	440R-N 23135
MSR127TP	3 N.O.	1 N.C.	Removable (Screw)	Auto./Manual	24V AC/DC	5-24	440R-N 23132
MSR126T	2 N.O.	None	Fixed	Auto./Manual	24V AC/DC	5-22	440R-N 23117
MSR30RT	2 N.O. Solid State	1 N.O. Solid State	Removable	Auto./Manual or Monitored Manual	24V DC	5-16	440R-N 23198

Modular Safety Relays

MSR210P Base 2 N.C. only	2 N.O.	1 N.C. and 2 PNP Solid State	Removable	Auto./Manual or Monitored Manual	24V DC from the base unit	5-74	440R-H 23176
MSR220P Input Module	—	—	Removable	—	24V DC	5-78	440R-H 23178
MSR310P Base	MSR 300 Series Output Modules	3 PNP Solid State	Removable	Auto./Manual Monitored Manual	24V DC	5-94	440R-W 23219
MSR320P Input Module	—	2 PNP Solid State	Removable	—	24V DC from the base unit	5-98	440R-W 23218

Note: For additional Safety Relays connectivity, see the Safety Relays section (page 5-8) of this catalog.

For additional Safety I/O and Safety PLC connectivity, see the Programmable Safety System section (page 5-107) of this catalog.

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

Connection Systems

Description	6-Pin Micro (M12)	5-Pin Micro (M12)
Cordset	889R-F 6EC A-*	—
Patchcord	889R-F 6ECRM-*	889R-F 5ECRM-*
Distribution Box	898R-P 68MT-A5	—
Shorting Plug	898R-P 61MU-RM	—
T-Port	NA	—

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

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

Note: For additional information, see the Safety Connection System section (page 7-1) of this catalog.

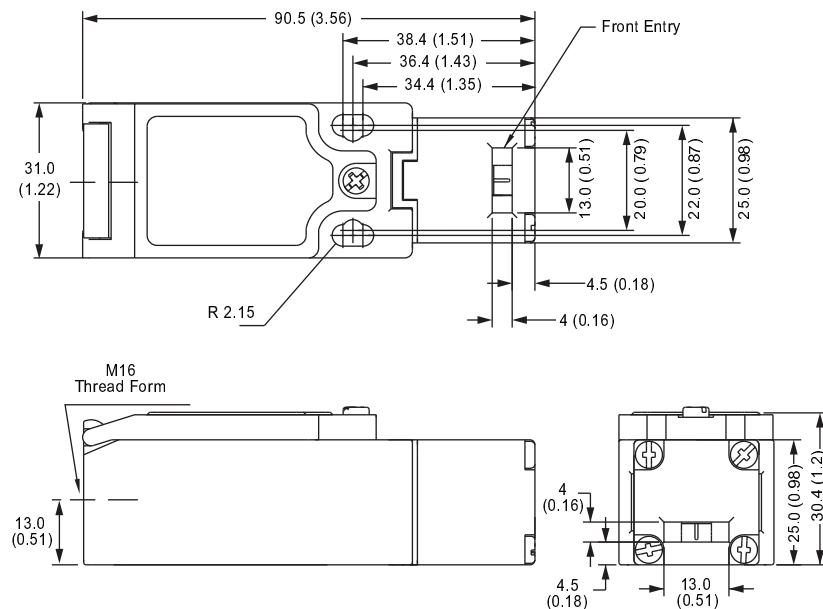
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Accessories

Description		Dimensions	Cat. No.
	Flat Actuator; Not to be used with Metal Alignment Guide	3-52	440K-A21014
	90° Actuator; Not to be used with Metal Alignment Guide	3-52	440K-A21006
	Metal Alignment Guide with Semi-Flexible Actuator	3-52	440K-A21030
	Replacement Cover	3-54	440A-A21115
	Dust Cover	3-54	440K-A17182

Approximate Dimensions—mm (inches)

Dimensions are not intended to be used for installation purposes.



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

Typical Wiring Diagrams

Description	2 N.C. & 1 N.O.	3 N.C.																		
Contact Configuration	<p>Safety A (NC) Safety B (NC) Aux A (NO)</p>	<p>Safety A (NC) Safety B (NC) Safety C (NC)</p>																		
Contact Action	<p>BBM</p> <p>MBB</p> <p>□ Open ■ Closed</p>	<p>3.1 0 mm</p>																		
6-Pin Micro (M12)	<p>3-Aux A 4-Aux A 5-Safety A 6-Safety B 2-Safety B 1-Safety A</p>	<p>3-Safety C 4-Safety C 5-Safety A 6-Safety B 2-Safety B 1-Safety A</p>																		
5-Pin Micro (M12)	—	<p>5-Safety B 2-Safety A 1-Safety A 3-N/A 4-Safety B</p>																		
Cordset 889R-F6ECA-*	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">Red/White</td> <td style="width: 85%;">Safety A</td> </tr> <tr> <td>Red/Black</td> <td></td> </tr> <tr> <td>Red</td> <td style="text-align: center;">Safety B</td> </tr> <tr> <td>Red/Blue</td> <td></td> </tr> <tr> <td>Green</td> <td style="text-align: center;">Aux A</td> </tr> <tr> <td>Red/Yellow</td> <td></td> </tr> </table>	Red/White	Safety A	Red/Black		Red	Safety B	Red/Blue		Green	Aux A	Red/Yellow		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">Safety A</td> <td style="width: 85%;">Safety A</td> </tr> <tr> <td>Safety B</td> <td></td> </tr> <tr> <td>Safety C</td> <td></td> </tr> </table>	Safety A	Safety A	Safety B		Safety C	
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