

# Safety Switches

## IEC Style Switches

### 22 mm Plastic Body



### Description

These 22 mm plastic-body safety limit switches conform to EN 50047 standards and are available with snap-acting or slow-break/make 2- or 3-contact configurations as well as a variety of actuator heads.

These switches also feature an optional rotating head that can be adjusted in 90° increments before installation to allow for ease of mounting.

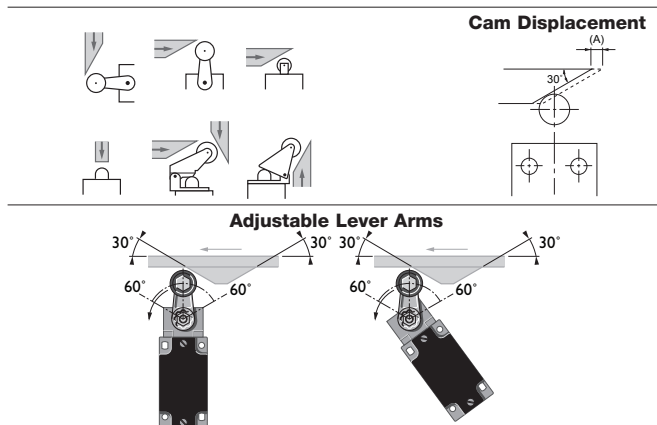
Allen-Bradley Guardmaster limit switches can be used in guard door applications as well as on moving machine beds, crane arms, lifts, elevators, etc.

Operation of these limit switches is achieved by the sliding action of a guard, or other moving object, deflecting the plunger or lever. For safety applications, it is important that upon actuation, the guard or moving object should not pass completely beyond the switch to allow the plunger or lever to return to its original position—the plunger or lever must remain engaged by the guard or object.

### Features

- Large selection of actuator heads
- Positive operation, forced disconnection of contacts
- Snap-acting, slow make before break or slow break before make contact blocks
- Contacts 1 N.C. + 1 N.O., 2 N.C. + 1 N.O. 3 N.C.
- Conforms to EN 50047, EN 1088, EN 60947-5-1, EN 292 and EN 60204-1

### Operating Examples



The actuating cam should be profiled at 30° for optimum operation.

**Note:** Plunger-type switches operate from a flat profile.

### Specifications


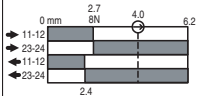
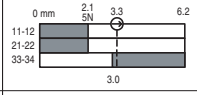
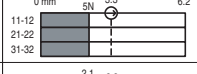


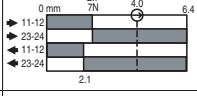
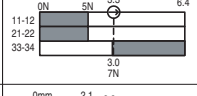

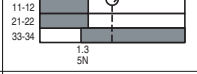

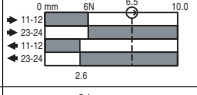
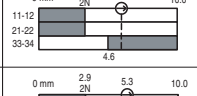
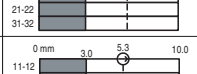
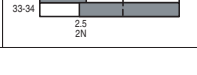
Safety Ratings	
Standards	EN 954-1, ISO 13849-1, IEC/EN 60204-1, NFPA 79, EN 1088, ISO 14119, IEC/EN 60947-5-1, ANSI B11.19, AS 4024.1
Safety Classification	Cat. 1 Device per EN 954-1 Dual channel limit switch suitable for Cat. 3 or 4 systems and used with a safety monitoring device
Functional Safety Data *	B10d: > 2 x 10 <sup>6</sup> operations at min. load PFH <sub>D</sub> : > 3 x 10 <sup>-7</sup> MTTF <sub>d</sub> : > 385 years Dual channel limit switch may be suitable for performance levels Ple or Pld (according to ISO 13849-1:2006) and for use in SIL2 or SIL3 systems (according to IEC 62061) depending on application characteristics
Certifications	CE Marked for all applicable directives, cULus, and TÜV
Outputs	
Safety Contacts *	1 N.C. snap acting, 2 N.C. or 3 N.C. slow acting
Auxiliary Contacts	1 N.O. (except 3 N.C. versions)
Thermal Current <sub>I<sub>th</sub></sub>	10 A
Rated Insulation Voltage	600V AC
Switching Current @ Voltage, Min.	25 mA @ 5V DC
Utilization Category	
A600/AC-15	(Ue) 600V 500V 240V 120V (Ie) 1.2 A 1.4 A 3.0 A 6.0 A
N600/DC-13	(Ue) 600V 500V 250V 125V (Ie) 0.4 A 0.55 A 1.1 A 2.2 A
Operating Characteristics	
Actuation Speed, Max.	250 mm/s
Actuation Speed, Min.	100 mm/min
Actuation Frequency, Max.	6000 operation per hour
Mechanical Life	1 x 10 <sup>7</sup>
Environmental	
Enclosure Type Rating	IP66
Operating Temperature [C (F)]	-25...80° (-18...+176°)
Pollution Degree	3
Physical Characteristics	
Housing Material	UL Approved glass-filled polybutylene terephthalate
Actuator Material	Various polymers and metals
Mounting	2 x M4, Any position
Vibration	IEC 68-2-6 (10...55 Hz, 0.35 mm amplitude)
Shock	IEC 68-2-7 (30 Gn 3 pulses per axis)
Conduit Entry	M20 or 1/2 inch NPT
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**

Description	Contact			Typical Force/Torque to Operate	Contact Opening Characteristics □ Open ■ Closed ⊕ Positive Opening Point	Cat. No.		
	Safety	Auxiliary	Type			1/2 inch NPT Conduit	M20 Conduit	Connector Style*
	1 N.C.	1 N.O.	Snap acting	5 N		<b>440P-CRPS11E</b>	440P-CRPS11B	440P-CRPS11D4
	2 N.C.	1 N.O.	BBM	6 N		440P-CRPB12E	440P-CRPB12B	440P-CRPB12R6
	3 N.C.	—	—	5 N		440P-CRPB03E	440P-CRPB03B	440P-CRPB03R6
Roller Plunger	2 N.C.	1 N.O.	MBB	6 N		440P-CRPM12E	440P-CRPM12B	440P-CRPM12R6
	1 N.C.	1 N.O.	Snap acting	5N		<b>440P-CDPS11E</b>	440P-CDPS11B	440P-CDPS11D4
	2 N.C.	1 N.O.	BBM	6N		440P-CDPB12E	440P-CDPB12B	440P-CDPB12R6
	3 N.C.	—	—	5N		440P-CDPB03E	440P-CDPB03B	440P-CDPB03R6
Dome Plunger	2 N.C.	1 N.O.	MBB	6N		440P-CDPM12E	440P-CDPM12B	440P-CDPM12R6
	1 N.C.	1 N.O.	Snap Acting	5N		<b>440P-CHLS11E</b>	440P-CHLS11B	440P-CHLS11D4
	2 N.C.	1 N.O.	BBM	6N		<b>440P-CHLB12E</b>	440P-CHLB12B	440P-CHLB12R6
	3 N.C.	—	—	5N		440P-CHLB03E	440P-CHLB03B	440P-CHLB03R6
	Hinge Lever	2 N.C.	1 N.O.	MBB	6N		440P-CHLM12E	440P-CHLM12B
Recommended standard cordset, 2 m, 4-pin, DC Micro (M12) connector.								889D-F4AC-2
Recommended standard cordset, 2 m, 6-pin, AC Micro (M12) connector.								889R-F6ECA-2

\* D4 suffix uses a 4-pin DC Micro (M12) connector and R6 suffix uses a 6-pin AC Micro (dual keyway) consumer.

**3-Limit Switches**

**Typical Wiring Diagrams \***

**Two-Circuit Type D4 4-Pin Micro Connector**

Connector Pinout		1 N.C. + 1 N.O.	
		Terminal	Contact
	1	11	N.C.
	3	12	
	2	23	N.O.
	4	24	

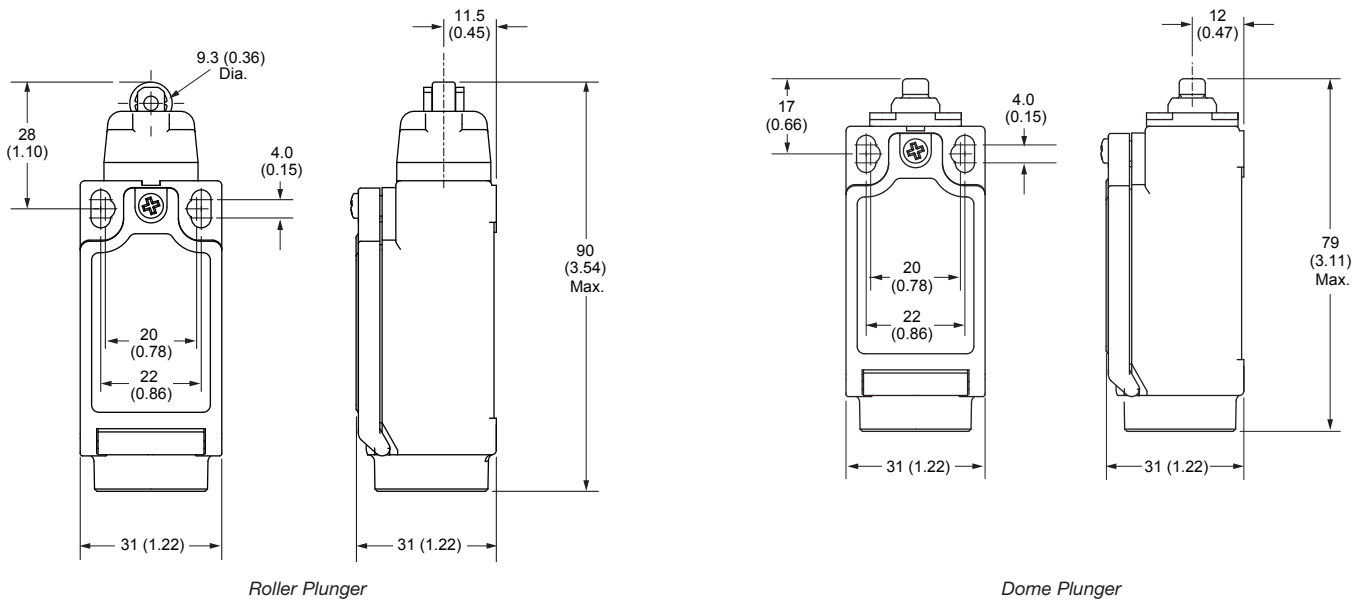
**Three-Circuit Type R6 6-Pin Micro Connector**

Connector Pinout		3 N.C.		2 N.C. + 1 N.O.	
		Terminal	Contact	Terminal	Contact
	1	11	N.C.	11	N.C.
	5	12	N.C.	12	N.C.
	2	21	N.C.	21	N.C.
	6	22	N.C.	22	N.C.
	3	33	N.O.	31	N.C.
	4	34		32	

\* See page 3-145 for positive opening circuits.

**Approximate Dimensions [mm (in.)]**

Dimensions are not intended to be used for installation purposes.

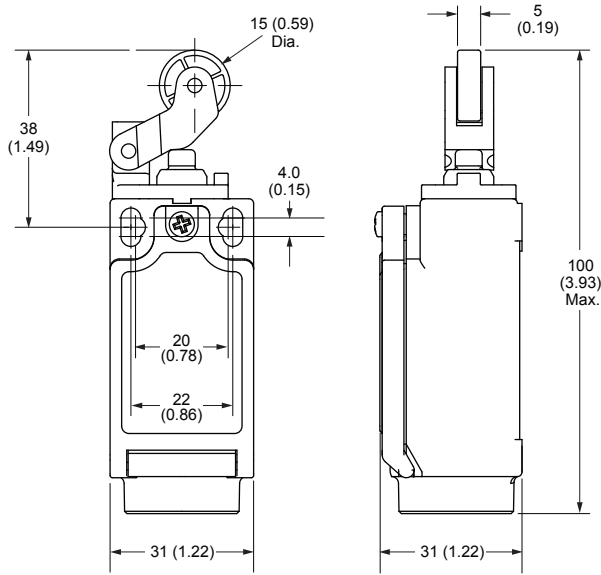


**3-Limit Switches**

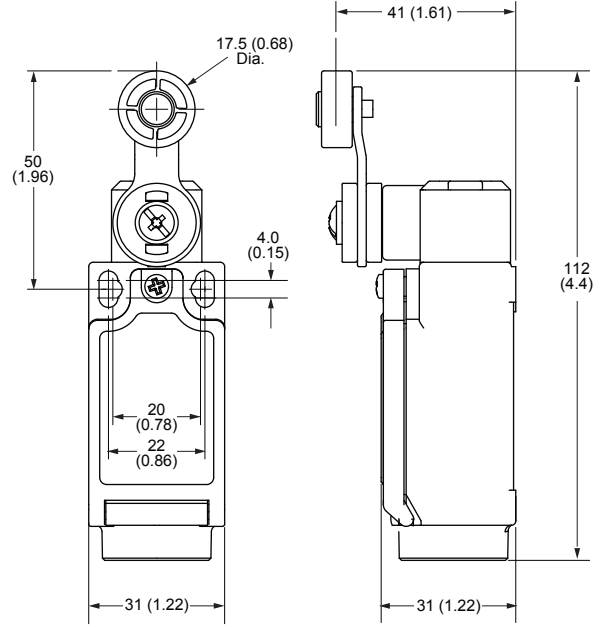
Safety Switches  
**IEC Style Switches**  
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Approximate Dimensions [mm (in.)] (continued)

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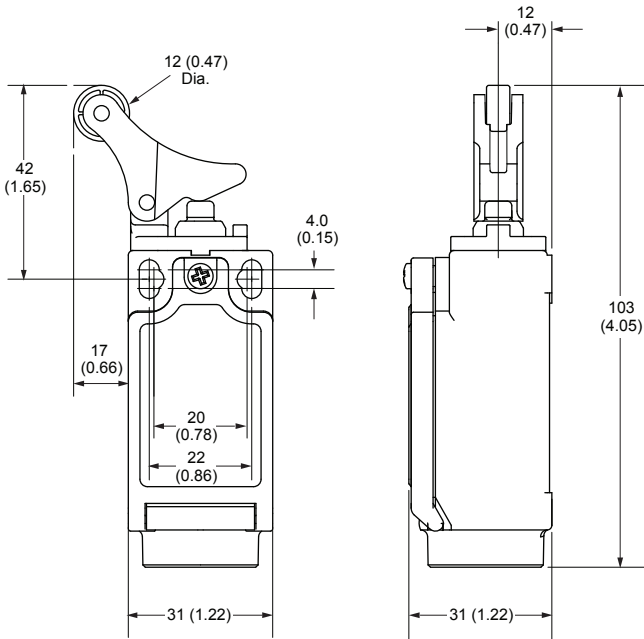


Hinge Lever



Short Lever,  
 Metal and Plastic Roller

3-Limit  
 Switches



Offset Hinge