

# Installation and Operating Instructions

## Bulletin 440P 2 N.C. Small Metal Safety Position Switches with 4-Pin Male Micro (M12) Connectors

**IMPORTANT: SAVE THESE INSTRUCTIONS FOR FUTURE USE.**

### ATTENTION



To avoid electrical shock and unintended operation of equipment, disconnect all power to the limit switch and the controlled equipment before proceeding with any repair or adjustment of the limit switch.

Improper selection or installation of the devices affect the integrity of the safety systems.

Personnel injury or death, property damage or economic loss can result.

Comply with ISO 14119 including selection, accessibility to the installation, arrangement and fastening, possible substitute actuation, access to the escape release, motivation to defeat, and actuation mode.

Management controls, working procedures, training, and additional protective measures should be used to minimize the motivation to defeat and to manage the use and availability of spare actuators.

Comply with ISO 13857 and ISO 13855 for guard openings and minimum (safe) distances.

Comply with IEC 62061 or ISO 13849-1 and ISO 13849-2 for functional safety.

### General Data

- Safety contacts: 2 N.C.
- Enclosure rating:
  - NEMA 1
  - IP65
- Rugged die cast housing
- 15 cm (6 in.) pigtail with 4-pin male micro (M12) QD
- Compact profile for access limited installation

### Principles, Standards, and Implementation

Before installation in a safety application, a risk assessment should be performed to determine whether the specifications of this device are suitable for foreseeable operational and environmental characteristics of the machine which is to be controlled. When applying these limit switches in a safety system application, all applicable standards for application should be followed.

Operating specifications must be followed and actuator must be displaced beyond the point where Direct Opening Action occurs. These devices are not to be used to directly control a motor.

### Specifications

Safety Ratings	
Standards	ISO 13849-1, EN 60204-1, NFPA 79, ISO 14119, EN 60947-5-1, ANSI B11.19 AS 4024.1
Safety Classification	Cat. 1 Device per ISO 13849-1 Dual channel limit switch suitable for Cat. 3 or 4 systems
Certifications	cULus Listed, TÜV and CE Marked for all applicable directives

### IMPORTANT

Installation of Allen-Bradley Guardmaster products should be in accordance with local and/or national codes. Servicing energized industrial control equipment can be hazardous if not in accordance with recommended safety procedures.

EN ISO 14119 replaces EN 1088 as the harmonized standard for interlocking devices associated with guards.

Functional safety information: [http://literature.rockwellautomation.com/idc/groups/literature/documents/sr/safety-sr001\\_-en-e.pdf](http://literature.rockwellautomation.com/idc/groups/literature/documents/sr/safety-sr001_-en-e.pdf)

### Outputs

Safety Contacts	2 N.C. snap acting
Thermal Current ( $I_{th}$ )	3 A
Rated Insulation Voltage (ui)	250V AC
Short Circuit Protection	3 A max. fast acting fuse IEC 269 type gG or equivalent

### Connector Ratings

#### Maximum for 4-Pin Male Micro (M12) <sup>1</sup>

AC	DC
60V, 3 A	60V, 3 A

### Operating Characteristics

Actuation Speed, Max.	250 mm/s
Actuation Speed, Min.	100 mm/min
Actuation Frequency, Max.	6000 ops/hr
Mechanical Life	1 x 10 <sup>7</sup> operations at room temperature

### Environmental

Enclosure Type Rating	NEMA 1, IP65
Operating Temperature [C (F)]	2...70 ° (35.6...158 °)
Pollution Degree <sup>2</sup>	3

### Physical Characteristics

Housing Material	Die cast alloy
Actuator Material	Various polymers and metals
Mounting	2 x M4, any position
Vibration	IEC 60068-2-6 (10...55 Hz, 0.35 mm amplitude)
Shock	IEC 60068-2-7 (30 Gn 3 pulses per axis)
Connection	15 cm (6 in.) 5/22 AWG UL AWM 2464 pigtail with 4-pin male M12 QD
Enclosure Color	Red body/black head

### ATTENTION



<sup>1</sup> For safe operation, the M12 female connector of the connecting cable must be rated 60V 3 A or higher per standard EN61984.

<sup>2</sup> The M12 female connector of the connecting cable must have a minimum sealing of IP65 to maintain a pollution degree 3 rating.



Electrical life is dependent on load, therefore, operations are not applicable and withdrawn.

Product	Intended Use
440P	Cam actuated

**ISO 14119 defines types of interlocking devices and coding:**

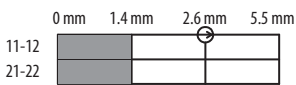
Product	Type	Coding
440P	1	Uncoded

**CE** The products shown on this document conform with the Essential Health and Safety Requirements (EHSRs) of the European Machinery Directive. They are third party certified to EN 60947-5-1 and EN ISO 14119.

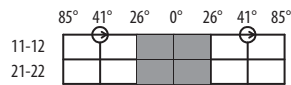
Declaration of Conformity and certification: [www.rockwellautomation.com/certification/ce.page](http://www.rockwellautomation.com/certification/ce.page)

**Contact Opening Characteristics**

**Plunger Type**

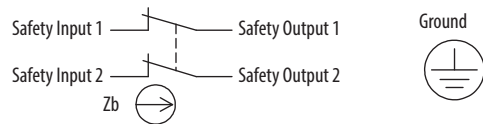


**Lever Type**



- Open
- Closed
- Positive Opening Point

**Wiring Diagram**

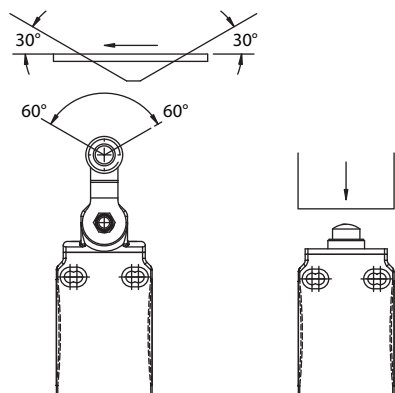


**Maintenance**

These devices require little maintenance, but routine visual inspection is recommended to keep foreign debris from collecting on the exterior actuators and rollers. Removing the operator head is not recommended as loose internal components may be lost or improperly re-installed.

**Actuation Guidelines**

The method of actuation and over travel has significant influence on the service life of the limit switch. To maximize the service life, it is recommended to provide an actuator with a 30° pressure angle and a surface hardness of Rc-45 max.



**ATTENTION**



Under no circumstances must the switch be actuated beyond the mechanical travel specified. Serious damage to the device and property could result.

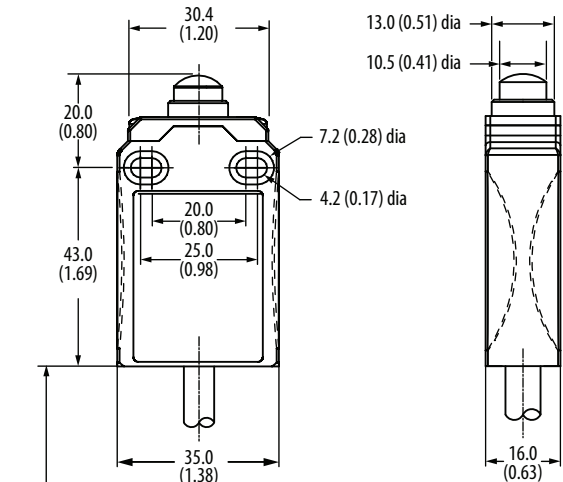
**Lever Positioning**

Some rotary switches are supplied with levers that are mechanically coupled to the actuating shaft. The lever may be removed and re-installed for cam tracking adjustment. See table below for torque recommendations.

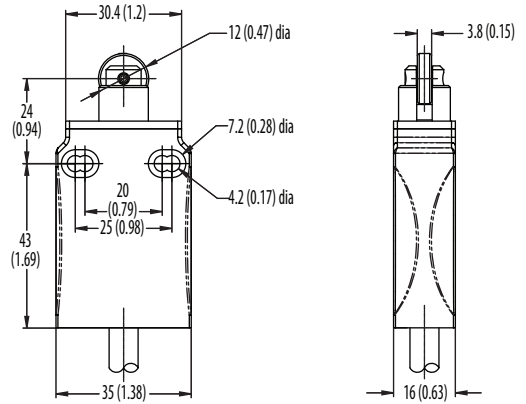
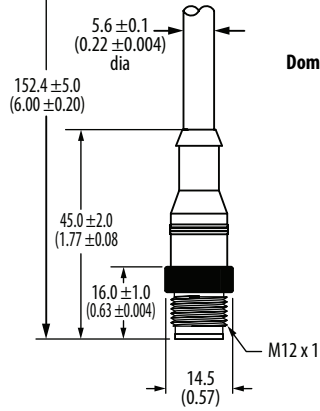
**Torque Specifications**

Location	Torque
3.5 mm Operator Head Phillips Screws	0.8 N•m (7.1 lb•in)
Short and Wide Roller Lever Arm 8 mm Hex Nut	1.0 N•m (8.85 lb•in)
Adjustable Lever Arm 4 mm Allen Head Screw	1.8...2.8 N•m (15.93...24.78 lb•in)
Adjustable Lever Arm Collar 3 mm Allen Head Screw	3.2 N•m (28.32 lb•in)
12 mm Panel Mount Nut	1.5 N•m (13.28 lb•in)

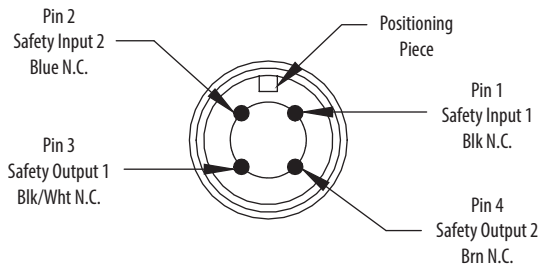
# Mounting Dimensions, Plunger Type Switches [mm (in.)]



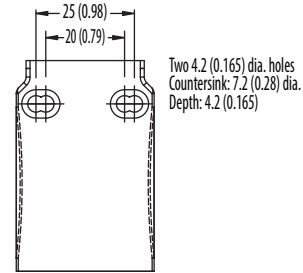
**Dome Plunger**



**Roller Plunger**

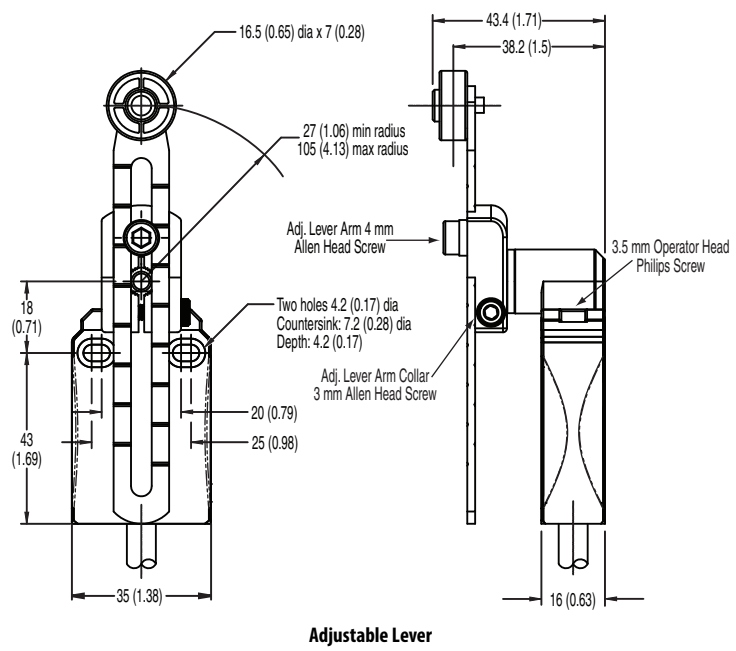
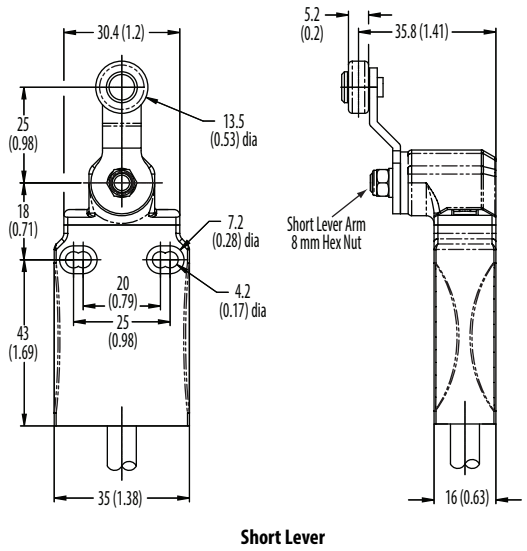


**4-Pin Male Micro (M12)**



**Countersink Holes**

## Mounting Dimensions, Plunger Type Switches [mm (in.)]



### ATTENTION



Operator heads with adjustable actuators should **NOT** be used for safety applications.

Rockwell Automation maintains current product environmental information on its website at <http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page>.

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