

# EFM SERIES MINIATURE METAL SAFETY LIMIT SWITCH


## Description

The EFM series have been tested and approved to meet the requirements of the Low Voltage directive and positive opening safety contacts per IEC/EN 60947-5-1-3.

Typical applications for these switches would use the roller plunger in conjunction with cams on doors with hinges .

A rang of panel mounting or top mounting versions are also available to ensure that the switch can be simply installed in small space or difficult mounting.

## Features

- Conforms to EN (TUV) standards corresponding to the CE marking
- Positive opening operation of NC (Normally Closed) contacts conforming to IEC /EN 60947-5-1 
- Wide standard operating temperature range: -25°C to 70°C
- Full range of actuator heads and levers suitable for safety applications
- Sealing up to IP 67
- International conduit sizes



## Specifications

### Safety Ratings

Standards	EN 945-1,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 945-1 Dual channel limit switch suitable for Cat 3 or 4 systems
Certifications	TUV and CE ,marked for all applicable directives

### Outputs

Safety Contacts	1 N.C. snap acting
Auxiliary Contacts	1 N.O
Thermal Current (Ith)	10A
Rated Insulation Voltage (ui)	300 AV
Short Circuit Protection	10A max. fast acting IEC 60269 type gG or equivalent

### 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> operation at room temperature

### Environmental

Enclosure Type Rating	NEMA 1,IP66 and IP67
Operating Temperature [C (F)]	2....+70°(35.6....+158°)
Pollution Degree	3

### Physical Characteristics

Housing Material	Die Cast Alloy
Actuator Material	Various polymers and metals
Mounting	2 x M4, Any position
Vibration	IEC 68-2-6 (10....55Hz,0.35 mm amplitude)
Shock	IEC 68-2-7(30 Gn 3 pulses per axis)
Connection	2 m(6.5 ft) cable
Enclosure Color	Red body/black hear

## Contact Ratings

Maximum AC Contact Rating Per Pole (50/60Hz)-Same Polarity						
NEMA Rating Designation	Max. Voltage	Amperes		Continuous Carrying Current(Amp.)	Voltamperes	
		Make	Break		Make	Break
AC-15/B300	120	30	3.0	5	3600	360
AC-15/B300	240	15	1.5	5	3600	360
Maximum DC Contact Rating Per Pole						
DC-13/Q300	240	0.27	0.27	2.5	69	69

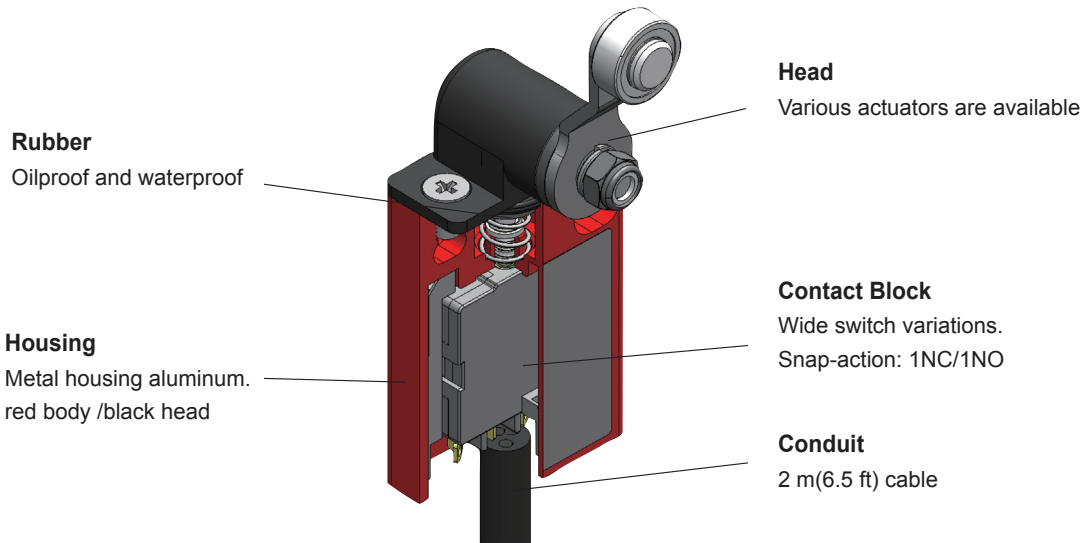
**HIGHLY**

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Design, specifications are subject to change without notice.

# EFM SERIES MINIATURE METAL SAFETY LIMIT SWITCH

## Structure Description



## Product Selection

EFM-□-□-□

1 2 3

### 1. CABLE ENTRY

L: Cable on the side

V: Cable on the bottom

### 2. CONTACT TYPES

3: 1NC/1NO SNAP ACTION

### 3. HEAD AND ACTUATOR

20 : Short Lever type

31 : Dome plunger type

32 : Roller plunger type

321: Cross roller plunger type

51 : Panel mount dome plunger type

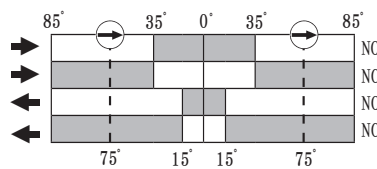
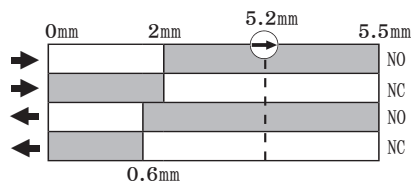
52 : Panel mount roller plunger type

521: Panel mount cross roller plunger type

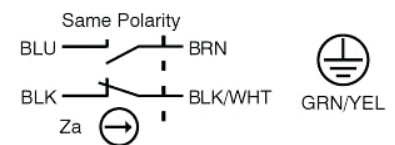
## Contact Block Form

□ Oper    ■ losed

⊕ Positive Opening Point



## Wiring Diagram



**HIGHLY**


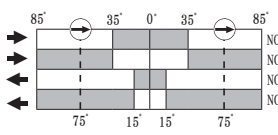
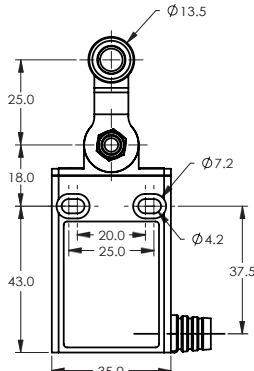
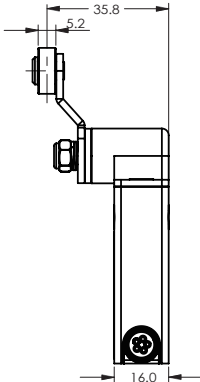

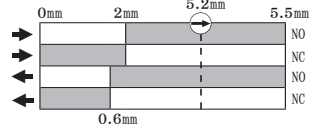
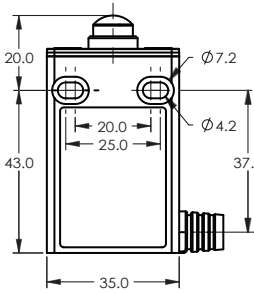
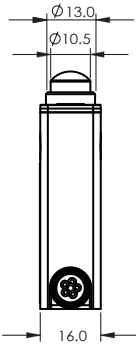

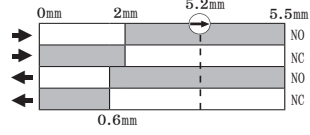
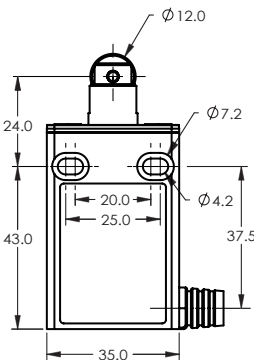
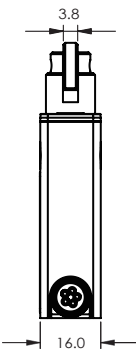

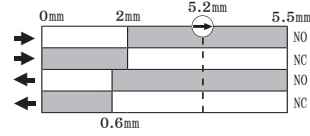
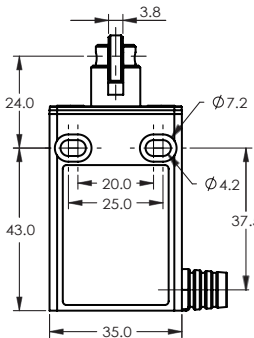
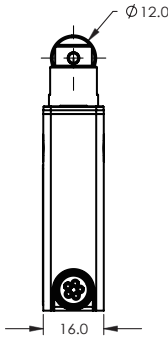
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# EFM SERIES MINIATURE METAL SAFETY LIMIT SWITCH

Unit: mm

## Operating Characteristics

Item	Operating Characteristics	Dimensions	
<p><b>EFM-□-3-20</b> Short Lever Type</p> 	<p>Snap Action 1NC\1NO EFM_-3-20</p> 		
<p><b>EFM-□-3-31</b> Dome Plunger Type</p> 	<p>Snap Action 1NC\1NO EFM_-3-31</p> 		
<p><b>EFM-□-3-32</b> Roller Plunger Type</p> 	<p>Snap Action 1NC\1NO EFM_-3-32</p> 		
<p><b>EFM-□-3-321</b> Cross Roller Plunger Type</p> 	<p>Snap Action 1NC\1NO EFM_-3-321</p> 		

# EFM SERIES MINIATURE METAL SAFETY LIMIT SWITCH

## Operating Characteristics

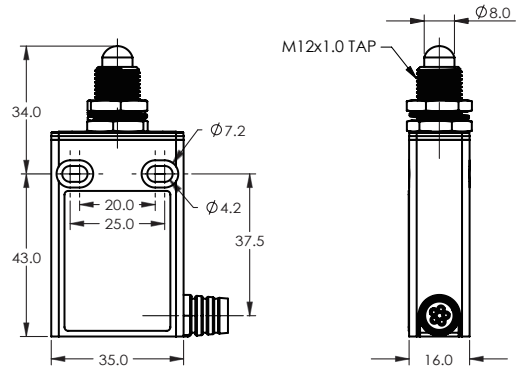
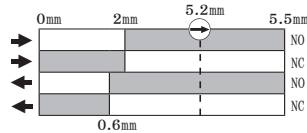
Unit: mm

Item                                      Operating Characteristics                                      Dimensions

### EFM-□-3-51

Panel Mount Dome Plunger Type

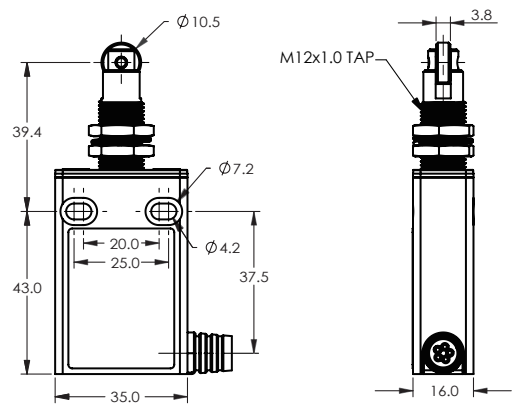
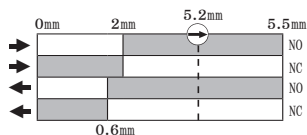
Snap Action 1NC1NO  
EFM\_-3-51



### EFM-□-3-52

Panel Mount Roller Plunger Type

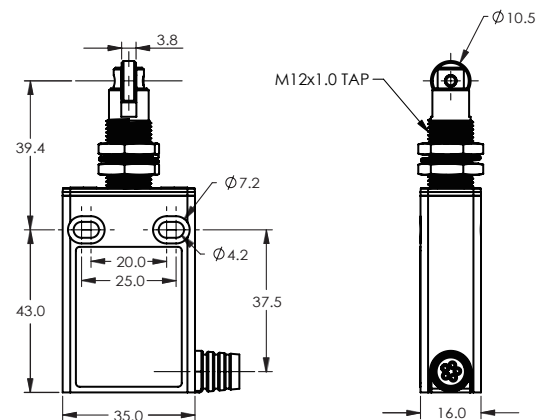
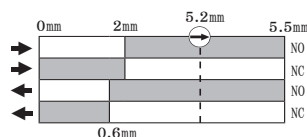
Snap Action 1NC1NO  
EFM\_-3-52



### EFM-□-3-521

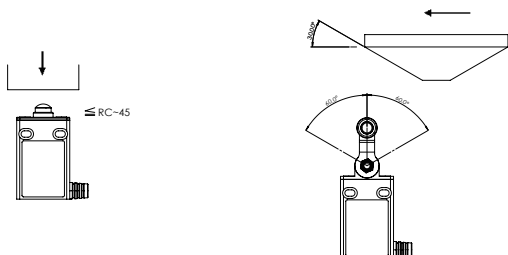
Panel Mount Cross Roller Plunger Type

Snap Action 1NC1NO  
EFM\_-3-521



## 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.



## Bottom Cable Style

Two, 4.2(0.165) dia.  
Holes countersink: 7.2(0.28) dia.  
Depth: 4.2(0.165)

