

# 2.1

## Limit Switches

### E47 Precision Switches

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### E47 Precision Switches

#### Product Description

E47 Precision Switches from Eaton's electrical sector provide high accuracy switching at an affordable price. A variety of standard features, such as current capacity, operating force, travel characteristics and actuators, lets you custom fit the switch to your application.

The switches are available in their compact basic form, or enclosed in a rugged, metal housing.

#### Features

- Compact housings are ideal for use where space is restricted
- Precision, snap-action operators provide accurate repeatability of electrical and mechanical operating characteristics
- High current capacity (up to 20A) allows power load switching and motor handling capability
- Enclosed booted versions shield actuators from debris

### Contents

#### Description

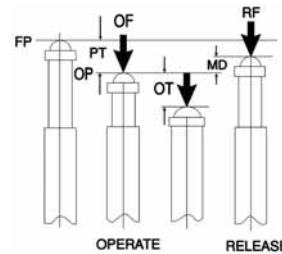
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For the most current information on this product, visit our Web site: [www.eaton.com](http://www.eaton.com)

### Operating Characteristics

#### Definitions



- OF—Operating Force
- RF—Return Force
- PT—Pre-Travel
- OT—Over-Travel
- MD—Movement Differential
- FP—Free Position
- OP—Operating Position

### Standards and Certifications

- UL Recognized
- CSA Certified
- CE
- RoHS



#### **⚠ DANGER**

**THIS SENSOR IS NOT A SAFETY DEVICE AND IS NOT INTENDED TO BE USED AS A SAFETY DEVICE. This sensor is designed only to detect and read certain data in an electronic manner and perform no use apart from that, specifically no safety-related use. This sensor product does not include self-checking redundant circuitry, and the failure of this sensor product could cause either an energized or de-energized output condition, which could result in death, serious bodily injury, or property damage.**

For Customer Service in the U.S. call 1-877-ETN CARE (386-2273), in Canada call 1-800-268-3578. For Application Assistance in the U.S. and Canada call 1-800-426-9184.

## Product Selection

## Basic Switches

## E47 Precision Switches—Basic

Type	Specifications <sup>①</sup>	15A Catalog Number	20A Catalog Number
<b>Pin Plunger</b>			
 Pin Plunger			
Screw terminal	OF max.—12.3 oz (350g) RF max.—4.02 oz (114g) PT max.—0.016 in (0.4 mm)	<b>E47BMS01</b>	<b>E47CMS01</b>
Solder terminal	OT max.—0.005 in (0.13 mm) MD max.—0.002 in (0.05 mm) OP—0.626 in (15.9 mm)	<b>E47BML01</b>	<b>E47CML01</b> <sup>②</sup>
<b>Extended Plunger</b>			
 Extended Plunger			
Screw terminal	OF max.—12.3 oz (350g) RF max.—4.02 oz (114g) PT max.—0.016 in (0.4 mm)	<b>E47BMS03</b>	—
Solder terminal	OT max.—0.063 in (1.6 mm) MD max.—0.002 in (0.05 mm) OP—1.11 in (28.2 mm)	<b>E47BML03</b>	—
<b>Straight Plunger</b>			
 Straight Plunger			
Screw terminal	OF max.—12.3 oz (350g) RF max.—4.02 oz (114g) PT max.—0.016 in (0.4 mm)	<b>E47BMS02</b>	<b>E47CMS02</b>
Solder terminal	OT max.—0.063 in (1.6 mm) MD max.—0.002 in (0.05 mm) OP—0.846 in (21.5 mm)	<b>E47BML02</b>	<b>E47CML02</b>
<b>Reversed Lever</b>			
 Reversed Lever			
Screw terminal	OF max.—5.29 oz (150g) RF max.—0.49 oz (14g) PT max.—0.16 in (4 mm)	<b>E47BMS21</b>	—
Solder terminal	OT max.—0.063 in (1.6 mm) MD max.—0.051 in (1.3 mm) FP max.—0.81 in (20.6 mm)	<b>E47BML21</b>	—
Spade terminal	OP—0.685 in (17.4 mm)	<b>E47BMT21</b>	—
<b>Straight Lever</b>			
 Straight Lever			
Screw terminal	OF max.—2.47 oz (70g) RF min.—0.49 oz (14g) PT max.—0.394 in (10 mm)	<b>E47BMS22</b>	<b>E47CMS22</b>
Solder terminal	OT max.—0.220 in (5.6 mm) MD max.—0.051 in (1.3 mm) FP max.—1.11 in (28.2 mm) OP—0.748 in (19 mm)	<b>E47BML22</b>	—
<b>Standard Lever</b>			
 Standard Lever			
Screw terminal	OF max.—3.53 oz (100g) RF min.—0.99 oz (28g) PT max.—0.197 in (5.0 mm)	<b>E47BMS20</b>	—
Solder terminal	OT max.—0.079 in (2.0 mm) MD max.—0.039 in (1.0 mm) FP max.—0.976 in (24.8 mm) OP—0.748 in (19 mm)	<b>E47BML20</b>	—
<b>Extended Straight Plunger</b>			
 Extended Straight Plunger			
Screw terminal	OF max.—12.3 oz (350g) RF max.—4.02 oz (114g) PT max.—0.016 in (0.4 mm)	<b>E47BMS04</b>	<b>E47CMS04</b>
Screw terminal (with space lugs)	OT max.—0.217 in (5.5 mm) MD max.—0.002 in (0.05 mm) OP—0.858 in (21.8 mm)	<b>E47BMT04</b>	—
Solder terminal		<b>E47BML04</b>	<b>E47CML04</b>

**Notes**

<sup>①</sup> OF = Operating Force; RF = Return Force; PT = Pre-Travel; OT = Over-Travel; MD = Movement Differential; FP = Free Position; OP = Operating Position.

<sup>②</sup> Contact Eaton's Sensor Applications Department at 1-800-426-9184 for approval status.



## E47 Precision Switches—Basic, continued

Type	Specifications <sup>①</sup>	15A Catalog Number	20A Catalog Number
<b>Roller Plunger</b>			
 Roller Plunger	Screw terminal	<b>E47BMS10</b>	<b>E47CMS10</b>
	Solder terminal	<b>E47BML10</b>	—
<b>Cross Roller Plunger</b>			
 Cross Roller Plunger	Screw terminal	<b>E47BMS11</b>	<b>E47CMS11</b>
	Solder terminal	<b>E47BML11</b>	—
<b>Reversed Roller Lever</b>			
 Reversed Roller Lever	Screw terminal	<b>E47BMS41</b>	—
	Solder terminal	<b>E47BML41</b>	—
<b>Extended Roller Lever</b>			
 Extended Roller Lever	Screw terminal	<b>E47BMS42</b>	<b>E47CMS42</b>
	Solder terminal	<b>E47BML42</b>	—
<b>Roller Lever</b>			
 Roller Lever	Screw terminal	<b>E47BMS30</b>	<b>E47CMS30</b>
	Solder terminal	<b>E47BML30</b>	—
	Spade terminal	<b>E47BMT30</b>	<b>E47CMT30</b>
<b>One-Way Roller</b>			
 One-Way Roller	Screw terminal	<b>E47BMS31</b>	—
	Solder terminal	<b>E47BML31</b>	—
<b>Integral Leaf</b>			
 Integral Leaf	Screw terminal	<b>E47BMS23</b>	<b>E47CMS23</b>
	Solder terminal	<b>E47BML23</b>	—

**Note**







<sup>①</sup> OF = Operating Force; RF = Return Force; PT = Pre-Travel; OT = Over-Travel; MD = Movement Differential; FP = Free Position; OP = Operating Position.

## E47 Precision Switches—Basic, continued

Type	Specifications <sup>①</sup>	15A Catalog Number	20A Catalog Number
<b>Adjustable Roller</b>	<b>Adjustable Roller</b>		
 Screw terminal	OF max.—17.64 oz (500g) RF min.—6.0 oz (170g) PT max.—0.197 in (5.0 mm) OT max.—0.5 in (12.7 mm)	<b>E47BMS40</b>	—
Solder terminal	MD max.—0.087 in (2.2 mm) FP max.—1.752 in (44.5 mm) OP—1.591 in (40.4 mm)	<b>E47BML40</b>	—
<b>Extended Adjustable Roller</b>	<b>Extended Adjustable Roller</b>		
 Screw terminal	OF max.—21.16 oz (600g) RF min.—10.58 oz (300g) PT max.—0.118 in (3.0 mm) OT max.—0.236 in (6.0 mm)	<b>E47BMS43</b>	—
Solder terminal	MD max.—0.079 in (2.0 mm) FP max.—1.614 in (41 mm) OP—1.591 in (40.4 mm)	<b>E47BML43</b>	—

## Enclosed Switches

## E47 Precision Switches—Enclosed

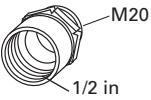

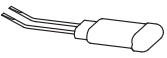
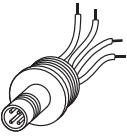
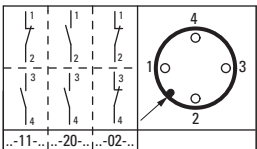
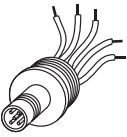
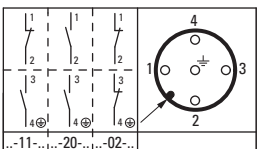
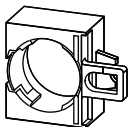
Specifications <sup>①</sup>	Catalog Number	Specifications <sup>①</sup>	Catalog Number
<b>Plunger Actuator</b>	<b>Plunger Actuator</b>	<b>Booted Roller Lever</b>	<b>Booted Roller Lever</b>
 OF max.—8.82–12.3 oz (250–350g) RF min.—4.02 oz (114g) PT max.—0.016 in (0.4 mm) OT max.—0.217 in (5.5 mm) MD max.—0.002 in (0.05 mm) OP—1.504 in (38.2 mm)	<b>E47BLS05</b>	 OF max.—22.57 oz (640g) RF min.—8.11 oz (230g) PT max.—0.197 in (5.0 mm) OT max.—0.236 in (6.0 mm) MD max.—0.016 in (0.4 mm)	<b>E47BLS33</b>
	<b>E47CLS05</b> <sup>②③</sup>		
<b>Booted Plunger</b>	<b>Booted Plunger</b>	<b>Roller Plunger</b>	<b>Roller Plunger</b>
 OF max.—28.22 oz (800g) RF min.—8.46 oz (240g) PT max.—0.079 in (2.0 mm) OT max.—0.197 in (5.0 mm) MD max.—0.004 in (0.1 mm) OP—1.803 in (45.8 mm)	<b>E47BLS06</b>	 OF max.—8.82–12.3 oz (250–350g) RF min.—4.02 oz (114g) PT max.—0.02 in (0.5 mm) OT max.—0.142 in (3.6 mm) MD max.—0.002 in (0.05 mm) OP—1.957 in (49.7 mm)	<b>E47BLS07</b>
	<b>E47CLS06</b> <sup>②③</sup>		<b>E47BLS11</b> <sup>④</sup>
<b>Roller Lever</b>	<b>Roller Lever</b>	<b>Booted Roller Plunger</b>	<b>Booted Roller Plunger</b>
 OF max.—20.1 oz (570g) RF min.—6.0 oz (170g) PT max.—0.157 in (4.0 mm) OT max.—0.236 in (6.0 mm) MD max.—0.016 in (0.4 mm)	<b>E47BLS32</b>	 OF max.—17.64 oz (500g) RF min.—3.53 oz (100g) PT max.—0.039 in (1.0 mm) OT max.—0.138 in (3.5 mm) MD max.—0.005 in (0.12 mm) OP—1.957 in (49.7 mm)	<b>E47BLS08</b>
	<b>E47CLS32</b> <sup>②③</sup>		<b>E47BLS12</b> <sup>④</sup>

## Notes

- ① OF = Operating Force; RF = Return Force; PT = Pre-Travel; OT = Over-Travel; MD = Movement Differential; FP = Free Position; OP = Operating Position.
- ② Contact Eaton's Sensor Applications Department at 1-800-426-9184 for approval status.
- ③ 20 ampere version.
- ④ Cross roller unit.

Accessories

LS-Titan Safety Switches

	For Use With	Description	Notes	Catalog Number
<b>V1-2-M20</b> 	Any	M20 screw terminal in 1/2 in. For use with American pipe thread, metal.	The screw connection must be earthed. Not total insulation.	<b>V1-2-M20-NA</b>
	Any	M20 screw terminal in 1/2 in. For use with American pipe thread, molded material.	—	<b>V1-2-M20</b>
<b>EMS20</b> 	Any	M20 diaphragm bolt. With internal push-through membrane. Will fit cable with an external diameter of up to 13 mm. Rated IP65 with cable inserted.	—	<b>EMS20</b>
<b>LS-XTW</b> 	Any	Cage Clamp tool.	—	<b>LS-XTW</b>
<b>M12A</b> 	LS-Titan plastic bodies (LS-_)	Plug connector, 12 mm, 4-pin male connector M12x1 (M12x1). Rated IP65. Molded material. Color coded to IEC/EN 60947-5-2.		<b>M12A</b>
<b>M12A5</b> 	LS-Titan metal bodies (LSM-_)	Plug connector, 12 mm, 5-pin male connector (M12x1). Rated IP65. Molded material. Color coded to IEC/EN 60947-5-2.		<b>M12A5</b>
<b>M22-LS</b> 	Any	Allows mounting of M22 pushbuttons. (See the M22 catalog, CA04716001E, for a full selection of pushbuttons.)	—	<b>M22-LS</b>