

February 2008

**Premium+ Series Short Barrel Inductive Proximity Sensors**


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The new Cutler-Hammer® Premium+ Series Short Barrel Inductive Proximity Sensors from Eaton’s electrical business feature the same sensing ranges as our standard length sensors, but in a body with a substantially shorter length. This allows the sensors to be used in applications where mounting space is limited.

Our robust Premium+ Series design has been added to the short barrel line. This means these sensors have been upgraded to include rugged stainless steel barrels, polycarbonate end bells, shock-resistant front cap and potting compound. Plus, the short barrel line now includes a choice of AC, AC/DC and DC-only, 12, 18 and 30 mm sensors. Cable models feature an optional extra long 5-meter cable. Every sensor is designed with 360° LED.

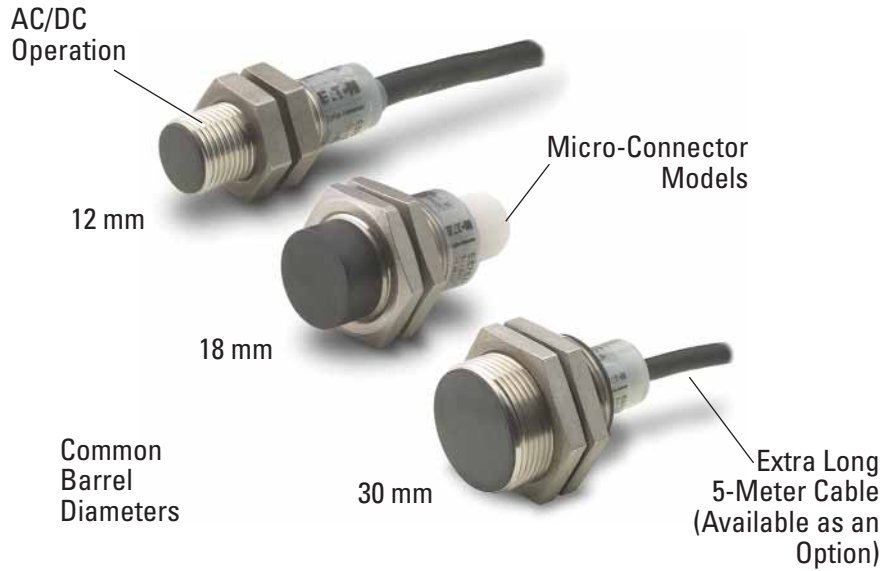
**Approvals**

- C-UL Listed
-  (AC/DC and DC-only models)



Unless otherwise noted, the products contained in this document are not designed or intended for use in human safety applications.

**These Sensors Feature a Short Barrel Length to Fit into Tight Locations**



**Product Features**

- Manufactured to take physical and environmental abuse
- Designed with stainless steel barrel and impact-absorbing new potting compound for robust, high temperature, high pressure washdown, as well as intense shock and vibration applications
- Unmatched high noise immunity eliminates problems associated with electrical noise (all models > 20V/meter)
- 360° output status indicator is visible from any angle and in any light condition
- Resettable short circuit protection in AC/DC and DC models
- Reverse polarity protection in 3-wire DC versions
- Small size to fit in tight spaces
- Choice of cable for low cost wiring, or micro-connector for quick installation or replacement
- Cable models include an extra long 5-meter cable as option

### Model Selection — Short Barrel Length Proximity Sensors

	Operating Voltage	Sensing Range (Sn)	Shielding	Connection Type <sup>①</sup>	Catalog Number	
					N.O. Output	N.C. Output
<b>2-Wire Sensors</b>						
12 mm Diameter 	20 – 250V AC	2 mm	Shielded	2-meter Cable	<b>E57SAL12A4</b>	<b>E57SBL12A4</b>
			Unshielded	3-pin Micro AC Connector	<b>E57SAL12A4SA</b> ☺	<b>E57SBL12A4SA</b> ☺
		4 mm	Shielded	2-meter Cable	<b>E57SAL12A4E</b>	<b>E57SBL12A4E</b>
			Unshielded	3-pin Micro AC Connector	<b>E57SAL12A4EA</b> ☺	<b>E57SBL12A4EA</b> ☺
	40 – 250V AC 50/60 Hz <sup>②</sup> 20 – 250V DC	2 mm	Shielded	2-meter Cable	<b>E57SAL12A2</b>	<b>E57SBL12A2</b>
			Unshielded	3-pin Micro AC Connector	<b>E57SAL12A2SA</b> ☺	<b>E57SBL12A2SA</b> ☺
		4 mm	Shielded	2-meter Cable	<b>E57SAL12A2E</b>	<b>E57SBL12A2E</b>
			Unshielded	3-pin Micro AC Connector	<b>E57SAL12A2EA</b> ☺	<b>E57SBL12A2EA</b> ☺
18 mm Diameter 	20 – 250V AC	5 mm	Shielded	2-meter Cable	<b>E57SAL18A4</b>	<b>E57SBL18A4</b>
			Unshielded	3-pin Micro AC Connector	<b>E57SAL18A4SA</b> ☺	<b>E57SBL18A4SA</b> ☺
		8 mm	Shielded	2-meter Cable	<b>E57SAL18A4E</b>	<b>E57SBL18A4E</b>
			Unshielded	3-pin Micro AC Connector	<b>E57SAL18A4EA</b> ☺	<b>E57SBL18A4EA</b> ☺
	40 – 250V AC 50/60 Hz <sup>②</sup> 20 – 250V DC	5 mm	Shielded	2-meter Cable	<b>E57SAL18A2</b>	<b>E57SBL18A2</b>
			Unshielded	3-pin Micro AC Connector	<b>E57SAL18A2SA</b> ☺	<b>E57SBL18A2SA</b> ☺
		8 mm	Shielded	2-meter Cable	<b>E57SAL18A2E</b>	<b>E57SBL18A2E</b>
			Unshielded	3-pin Micro AC Connector	<b>E57SAL18A2EA</b> ☺	<b>E57SBL18A2EA</b> ☺
30 mm Diameter 	20 – 250V AC	10 mm	Shielded	2-meter Cable	<b>E57SAL30A4</b>	<b>E57SBL30A4</b>
			Unshielded	3-pin Micro AC Connector	<b>E57SAL30A4SA</b> ☺	<b>E57SBL30A4SA</b> ☺
		15 mm	Shielded	2-meter Cable	<b>E57SAL30A4E</b>	<b>E57SBL30A4E</b>
			Unshielded	3-pin Micro AC Connector	<b>E57SAL30A4EA</b> ☺	<b>E57SBL30A4EA</b> ☺
	40 – 250V AC 50/60 Hz <sup>②</sup> 20 – 250V DC	10 mm	Shielded	2-meter Cable	<b>E57SAL30A2</b>	<b>E57SBL30A2</b>
			Unshielded	3-pin Micro AC Connector	<b>E57SAL30A2SA</b> ☺	<b>E57SBL30A2SA</b> ☺
		15 mm	Shielded	2-meter Cable	<b>E57SAL30A2E</b>	<b>E57SBL30A2E</b>
			Unshielded	3-pin Micro AC Connector	<b>E57SAL30A2EA</b> ☺	<b>E57SBL30A2EA</b> ☺
<b>3-Wire Sensors</b>						
12 mm Diameter 	6 – 48V DC	2 mm	Shielded (NPN)	2-meter Cable	<b>E57SAL12T110</b>	—
				4-pin Micro DC Connector	<b>E57SAL12T110SD</b> ☺	—
			Shielded (PNP)	2-meter Cable	<b>E57SAL12T111</b>	<b>E57SBL12T111</b>
				4-pin Micro DC Connector	<b>E57SAL12T111SD</b> ☺	<b>E57SBL12T111SD</b> ☺
		4 mm	Unshielded (NPN)	2-meter Cable	<b>E57SAL12T110E</b>	<b>E57SBL12T110E</b>
				4-pin Micro DC Connector	<b>E57SAL12T110ED</b> ☺	<b>E57SBL12T110ED</b> ☺
			Unshielded (PNP)	2-meter Cable	<b>E57SAL12T111E</b>	<b>E57SBL12T111E</b>
				4-pin Micro DC Connector	<b>E57SAL12T111ED</b> ☺	<b>E57SBL12T111ED</b> ☺
18 mm Diameter 	6 – 48V DC	5 mm	Shielded (NPN)	2-meter Cable	<b>E57SAL18T110</b>	<b>E57SBL18T110</b>
				4-pin Micro DC Connector	<b>E57SAL18T110SD</b> ☺	<b>E57SBL18T110SD</b> ☺
			Shielded (PNP)	2-meter Cable	<b>E57SAL18T111</b>	<b>E57SBL18T111</b>
				4-pin Micro DC Connector	<b>E57SAL18T111SD</b> ☺	<b>E57SBL18T111SD</b> ☺
		8 mm	Unshielded (NPN)	2-meter Cable	<b>E57SAL18T110E</b>	<b>E57SBL18T110E</b>
				4-pin Micro DC Connector	<b>E57SAL18T110ED</b> ☺	<b>E57SBL18T110ED</b> ☺
			Unshielded (PNP)	2-meter Cable	<b>E57SAL18T111E</b>	<b>E57SBL18T111E</b>
				4-pin Micro DC Connector	<b>E57SAL18T111ED</b> ☺	<b>E57SBL18T111ED</b> ☺
30 mm Diameter 	6 – 48V DC	10 mm	Shielded (NPN)	2-meter Cable	<b>E57SAL30T110</b>	<b>E57SBL30T110</b>
				4-pin Micro DC Connector	<b>E57SAL30T110SD</b> ☺	<b>E57SBL30T110SD</b> ☺
			Shielded (PNP)	2-meter Cable	<b>E57SAL30T111</b>	<b>E57SBL30T111</b>
				4-pin Micro DC Connector	<b>E57SAL30T111SD</b> ☺	<b>E57SBL30T111SD</b> ☺
		15 mm	Unshielded (NPN)	2-meter Cable	<b>E57SAL30T110E</b>	<b>E57SBL30T110E</b>
				4-pin Micro DC Connector	<b>E57SAL30T110ED</b> ☺	<b>E57SBL30T110ED</b> ☺
			Unshielded (PNP)	2-meter Cable	<b>E57SAL30T111E</b>	<b>E57SBL30T111E</b>
				4-pin Micro DC Connector	<b>E57SAL30T111ED</b> ☺	<b>E57SBL30T111ED</b> ☺

<sup>①</sup> Cable models are supplied as standard with a 2-meter cable. A 5-meter cable is available by adding **S5** to the Catalog Number. Example: E57SAL12T110 becomes E57SAL12T110S5.




☐ Fast turn product with typical one business day lead-time to shipment.

☐ Stocked product, typical order quantities guaranteed in stock.

☺☺ See listing of compatible connector cables on **Page 3**.

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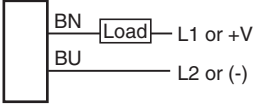
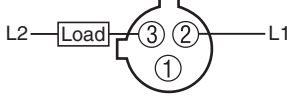
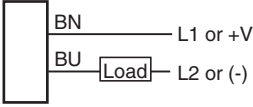
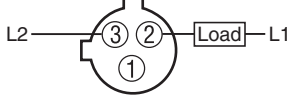
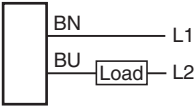
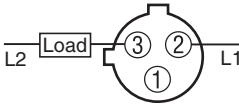
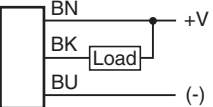
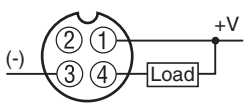
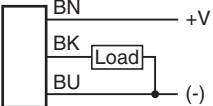
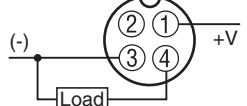
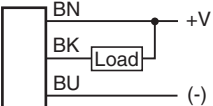
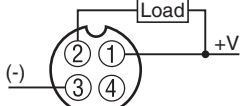
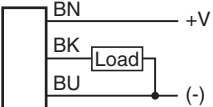
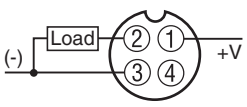
**Model Selection — Compatible Connector Cables** <sup>①</sup>

	Voltage Style	Number of Pins	Gauge	Length	Catalog Number			Pin Configuration/Wire Colors (Face View Female Shown)
					PVC Jacket	PUR Jacket	IRR PUR Jacket	
<b>Standard Cables — Micro Style</b>								
 Micro Style Straight Female	AC	3-pin 3-wire	22 AWG	6.0 feet (2m)	<b>CSAS3F3CY2202</b>	<b>CSAS3F3RY2202</b>	—	 1-Green 2-Red/Black 3-Red/White
	DC	4-pin 4-wire	22 AWG	6.0 feet (2m)	<b>CSDS4A4CY2202</b>	<b>CSDS4A4RY2202</b>	<b>CSDS4A4IO2202</b>	 1-Brown 2-White 3-Blue 4-Black

① For a full selection of connector cables, see **PG.05.05.T.E.**

 Stocked product, typical order quantities guaranteed in stock.

**Wiring Diagrams (Pin numbers are for reference, rely on pin location when wiring)**

Operating Voltage	Output	Cable Models	Micro-Connector Models (Face View Male Shown)
<b>2-Wire Sensors</b>			
20 – 250V AC/DC 45/65 Hz DC Wiring Example	N.O. and N.C. (NPN)		
	N.O. and N.C. (PNP)		
20 – 250V AC/DC and AC-only AC Wiring Example	N.O. and N.C.		
<b>3-Wire Sensors</b>			
6 – 48V DC	N.O. (NPN)		
	N.O. (PNP)		
	N.C. (NPN)		
	N.C. (PNP)		

### Specifications

	2 Wire AC Sensors	2-Wire AC/DC Sensors		3-Wire DC Sensors
		AC Operation	DC Operation	
Operating Voltage	40 – 250V AC	40 – 250V AC	20 – 250V DC	6 – 48V DC
Maximum Load Current	500 mA @ 25°C; 250 mA @ 70°C	250 mA @ 25°C ① 200 mA @ 70°C	250 mA @ 25°C 200 mA @ 70°C	500 mA @ 6 – 32V DC 250 mA @ 32 – 48V DC
Switching Frequency	20 Hz	60 Hz	60 Hz	12 mm: 800 Hz 18 mm: 500 Hz 30 mm: 300 Hz
Leakage Current	1.7 mA maximum @ 70°C	1.7V mA maximum @ 120V AC	≤2.0 mA	100 µA maximum
Voltage Drop	7V maximum	≤4V @ >25 mA	12V @ <10 mA	≤2.5V
Holding Current	5 mA minimum	5 mA minimum	5 mA maximum	≤10 mA
Protection	—	Resettable short circuit; overload protection	Resettable short circuit; overload protection	Auto reset
Switching Hysteresis	2 – 20% of rated sensing distance			
Repeat Accuracy	<3% sensing distance			
Output Indicator LED	360° viewable LED			
Operating Temperature	-13° to 158°F (-25° to 70°C) ①			
Enclosure Ratings	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67)			
Shock	30g sine wave, 11 mS per IEC68-2-76			
Vibration	10 to 55 Hz, 1 mm amplitude			
Material of Construction	Stainless steel, Polycarbonate end bells, Ryton® front cap			
Cable	AWM Style 20387 (PVC)			

Ryton® is a registered trademark of Phillips Chemical (division of Phillips Petroleum).

① Note: 240V AC operation is limited to less than 50°C in 2-wire AC/DC models.

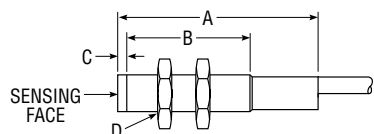
### Model Selection — Accessories

Description	Reference
Mounting Brackets	See <b>PG.05.03.T.E</b>
Replacement Mounting Nuts and Other Accessories	See <b>PG.05.04.T.E</b>
Connector Cables	See <b>PG.05.05.T.E</b>

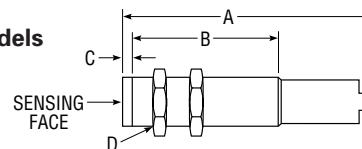
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**Approximate Dimensions in Inches (mm)**

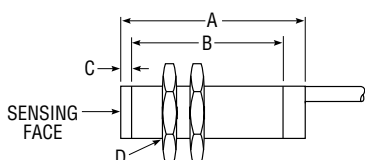
**12 mm  
Cable Models**



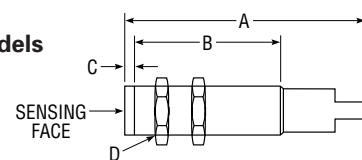
**12 mm  
Micro-Connector Models**



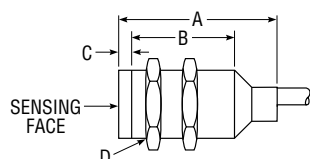
**18 mm  
Cable Models**



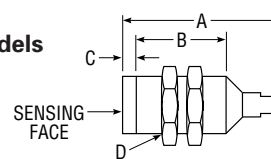
**18 mm  
Micro-Connector Models**



**30 mm  
Cable Models**



**30 mm  
Micro-Connector Models**



Size	Shielding	Dimensions in Inches (mm)			
		Overall Length A	Threaded Length B	C	Thread Size D

**2-Wire AC Sensors — Cable Models**

12 mm	Shielded	2.04 (51.7)	1.56 (39.6)	0.02 (0.5)	M12 x 1
	Unshielded	2.04 (51.7)	1.38 (35.1)	0.20 (5)	M12 x 1
18 mm	Shielded	1.39 (35.4)	0.86 (21.82)	0.02 (0.5)	M18 x 1
	Unshielded	1.39 (35.4)	0.60 (15.32)	0.28 (7)	M18 x 1
30 mm	Shielded	1.58 (40.2)	0.99 (25.15)	0.03 (0.8)	M30 x 1.5
	Unshielded	1.77 (44.9)	0.68 (17.27)	0.52 (13.26)	M30 x 1.5

**2-Wire AC Sensors — Micro-Connector Models**

12 mm	Shielded	2.27 (57.8)	1.56 (39.6)	0.02 (0.5)	M12 x 1
	Unshielded	2.27 (57.8)	1.38 (35.1)	0.20 (5)	M12 x 1
18 mm	Shielded	1.57 (40.0)	0.86 (21.82)	0.02 (0.5)	M18 x 1
	Unshielded	1.57 (40.0)	0.60 (15.32)	0.28 (7)	M18 x 1
30 mm	Shielded	1.76 (44.8)	0.99 (25.15)	0.03 (0.8)	M30 x 1.5
	Unshielded	1.95 (49.5)	0.68 (17.27)	0.52 (13.26)	M30 x 1.5

**2-Wire AC/DC Sensors — Cable Models**

12 mm	Shielded	2.46 (62.4)	1.98 (50.27)	—	M12 x 1
	Unshielded	2.46 (62.4)	1.80 (45.77)	0.20 (5)	M12 x 1
18 mm	Shielded	2.54 (64.5)	2.00 (50.9)	—	M18 x 1
	Unshielded	2.54 (64.5)	1.75 (44.4)	0.28 (7)	M18 x 1
30 mm	Shielded	2.72 (69.3)	2.12 (53.8)	—	M30 x 1.5
	Unshielded	2.72 (69.3)	1.63 (41.4)	0.52 (13.26)	M30 x 1.5

**2-Wire AC/DC Sensors — Micro-Connector Models**

12 mm	Shielded	2.69 (68.4)	1.98 (50.27)	—	M12 x 1
	Unshielded	2.69 (68.4)	1.80 (45.77)	0.20 (5)	M12 x 1
18 mm	Shielded	2.72 (69.06)	2.00 (50.9)	—	M18 x 1
	Unshielded	2.72 (69.06)	1.75 (44.4)	0.28 (7)	M18 x 1
30 mm	Shielded	2.91 (73.8)	2.12 (53.8)	—	M30 x 1.5
	Unshielded	2.91 (73.8)	1.63 (41.4)	0.52 (13.26)	M30 x 1.5

**3-Wire DC Sensors — Cable Models**

12 mm	Shielded	1.39 (35.2)	0.91 (23.09)	0.02 (0.5)	M12 x 1
	Unshielded	1.39 (35.2)	0.73 (18.59)	0.20 (5)	M12 x 1
18 mm	Shielded	1.39 (35.4)	0.86 (21.82)	0.02 (0.5)	M18 x 1
	Unshielded	1.39 (35.4)	0.60 (15.32)	0.28 (7)	M18 x 1
30 mm	Shielded	1.58 (40.2)	0.84 (21.26)	0.03 (0.8)	M30 x 1.5
	Unshielded	1.77 (44.9)	0.53 (13.46)	0.52 (13.26)	M30 x 1.5

**3-Wire DC Sensors — Micro-Connector Models**

12 mm	Shielded	1.64 (41.5)	0.91 (23.09)	0.02 (0.5)	M12 x 1
	Unshielded	1.64 (41.5)	0.73 (18.59)	0.20 (5)	M12 x 1
18 mm	Shielded	1.59 (40.3)	0.86 (21.82)	0.02 (0.5)	M18 x 1
	Unshielded	1.59 (40.3)	0.60 (15.32)	0.28 (7)	M18 x 1
30 mm	Shielded	1.77 (45.0)	0.84 (21.26)	0.03 (0.8)	M30 x 1.5
	Unshielded	1.96 (49.7)	0.53 (13.46)	0.52 (13.26)	M30 x 1.5