

### Ferrous Only Tubular Sensors



### Contents

<b>Description</b>	<b>Page</b>
Ferrous Only Tubular Sensors	
Product Selection	
Ferrous Only Tubular Sensors . . . . .	<b>V8-T3-52</b>
Compatible Connector Cables . . . . .	<b>V8-T3-52</b>
Accessories . . . . .	<b>V8-T3-52</b>
Technical Data and Specifications . . . . .	<b>V8-T3-53</b>
Wiring Diagrams . . . . .	<b>V8-T3-53</b>
Dimensions . . . . .	<b>V8-T3-53</b>

## Ferrous Only Tubular Sensors

### Product Description

These unique Inductive Proximity Sensors have been specially made by Eaton's electrical sector to detect only a specific type of metal. Ferrous Only models will detect only ferrous metals such as steel, iron, nickel or cobalt.

A typical application for **Ferrous Only** sensors would be in workcell applications where cutting tools, tool pallets and fixtures must be detected for proper workpiece manipulation. The sensors detect ferrous objects while ignoring aluminum.

These sensors are available in a standard 18 mm diameter, and are epoxy filled for shock/vibration resistance and heat tolerance.

### Features

- Ferrous Only sensors detect ferrous metals, such as steel or iron, while ignoring non-ferrous metals
- Selection of two-wire and three-wire, AC/DC and DC-only sensor models
- Wide operating temperature range: -13° to 158°F (-25° to 70°C)

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

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.

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## Inductive Proximity Sensors


### Ferrous Only Tubular Sensors

#### Product Selection


##### Ferrous Only Tubular Sensors

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#### Two-Wire Sensors





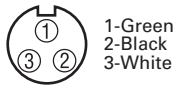
	Operating Voltage	Sensing Range (Sn)	Shielding	Connection Type	NO Output Catalog Number
	<b>18 mm Diameter</b>				
	20–250 Vac/Vdc 50/60 Hz	5.0 mm	Shielded	3-pin micro AC connector	<b>E57FAL18A2SA</b> Ⓢ
				3-pin mini-connector	<b>E57FAL18A2B1</b> Ⓢ

#### Three-Wire Sensors

	Operating Voltage	Sensing Range (Sn)	Shielding	Connection Type	NO Output Catalog Number
	<b>18 mm Diameter</b>				
	10–30 Vdc	5.0 mm	Shielded (PNP)	4-pin micro DC connector	<b>E57FAL18T111SD</b> Ⓢ

#### Compatible Connector Cables

##### Standard Cables ①

	Current Rating at 600V	Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number	
	<b>Micro-Style, Straight Female</b>								
	—	AC	3-pin, 3-wire	22 AWG	6.0 ft (2m)	 1-Green 2-Red/Black 3-Red/White	<b>CSAS3F3CY2202</b>	<b>CSAS3F3RY2202</b>	
	<b>Mini-Style, Straight Female</b>								
	13 A	—	3-pin	16 AWG	6.0 ft (2m)	 1-Brown 2-No Wire 3-Blue 4-Black	<b>CSDS4A3CY2202</b>	<b>CSDS4A3RY2202</b>	
						 1-Green 2-Black 3-White	<b>CSMS3F3CY1602</b>		

#### Accessories

##### Ferrous Only Tubular Sensors

Description	Reference
Mounting brackets	See <b>Tab 8, section 8.2</b>
Replacement mounting nuts and other accessories	See <b>Tab 8, section 8.3</b>
Connector cables	See <b>Tab 10, section 10.1</b>

##### Notes

ⓈⓈ See listing of compatible connector cables above.

① For a full selection of connector cables, see **Tab 10, section 10.1**.

### Technical Data and Specifications

#### Ferrous Only Tubular Sensors

Description	Two-Wire AC/DC Sensors	Three-Wire DC Sensors
Operating voltage	20–250 Vac/Vdc	10–30 Vdc
Maximum load current	100 mA	100 mA
Switching frequency	15 Hz	1000 Hz
Leakage current	2.5 mA maximum	<0.01 mA
Voltage drop	10V maximum	1.5V maximum
Holding current	5 mA minimum	—
Burden current	—	17 mA
Protection	Transient, power on false pulse suppression	Short circuit protection
Switching hysteresis	<15% rated sensing distance	<15% rated sensing distance
Repeat accuracy	<1% sensing distance	<1% sensing distance
Time delay before availability	<10 ms	<10 ms
Output indicator LED	Lights when output is ON	Lights when output is ON
Operating temperature	–13° to 131°F (–25° to 55°C)	–13° to 131°F (–25° to 55°C)
Enclosure ratings	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67)	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67)
Shock	30g sine wave, 11 ms per IEC68-2-76	30g sine wave, 11 ms per IEC68-2-76
Vibration	10 to 55 Hz, 1 mm amplitude in all three planes	10 to 55 Hz, 1 mm amplitude in all three planes
Housing material	Stainless steel	Stainless steel

### Wiring Diagrams

Pin numbers are for reference, rely on pin location when wiring.

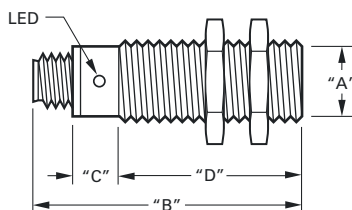
#### Ferrous Only Tubular Sensors

Operating Voltage	Output	Connector Models (Face View Male Shown)	
		Micro	Mini
<b>Two-Wire Sensors</b>			
20–250 Vac/Vdc 50/60 Hz	NO		
<b>Three-Wire Sensors</b>			
10–30 Vdc	NO (PNP)	—	

### Dimensions

Approximate Dimensions in Inches (mm)

#### Ferrous Only Tubular Sensors



#### Connector Models

Catalog Number	A	B	C	D
<b>Two-Wire Models</b>				
E57FAL18A2SA	M18 x 1	3.11 (79)	1.38 (35)	1.73 (44)
E57FAL18A2B1	M18 x 1	3.90 (99)	1.34 (34)	2.56 (65)
<b>Three-Wire Models</b>				
E57FAL18T111SD	M18 x 1	3.11 (79)	1.14 (29)	1.97 (50)