iProx

E57P Performance

AccuProx

E56 Pancake

Nonmetallic Tubular

E52 Cube Style

E51, Factory Sealed

Unless otherwise noted, the products contained in this section should not be used for functional safety applications. These products were not designed or tested to IEC 60947-5-3 or recommended for functional safety.

Learn Online

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.

Revision notes

Volume 8—Sensing Solutions, CA08100010E

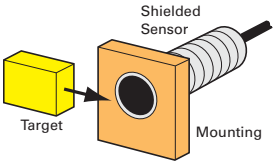
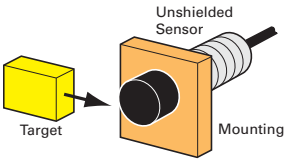
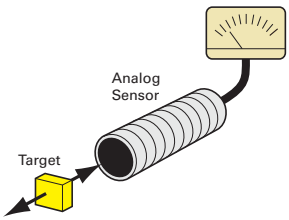
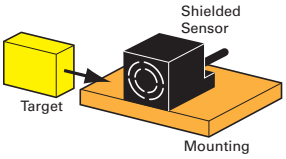
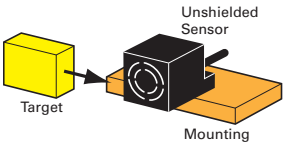
Tab 3—Inductive Proximity Sensors

Revision date	Section	Change page(s)	Description
09/08/2017	3.0	V8-T3-3, V8-T3-6–V8-T3-10	Content edit
09/08/2017	3.1	V8-T3-11	Content edit
09/08/2017	3.2	V8-T3-18	Content edit
09/08/2017	3.3	V8-T3-24, V8-T3-26	Content edit
09/08/2017	3.4	V8-T3-29	Content edit
09/08/2017	3.5	V8-T3-35 V8-T3-44–V8-T3-46	Content edit
09/08/2017	3.6	V8-T3-49, V8-T3-50	Content edit
09/08/2017	3.7	V8-T3-55	Content edit
09/08/2017	3.8	V8-T3-58	Content edit
09/08/2017	3.9	V8-T3-62	Content edit
09/08/2017	3.10	V8-T3-65, V8-T3-67	Content edit
09/08/2017	3.11	V8-T3-71	Content edit
09/08/2017	3.12	V8-T3-76	Content edit
09/08/2017	3.13	V8-T3-79	Content edit
09/08/2017	3.14	V8-T3-83	Content edit
09/08/2017	3.15	V8-T3-86	Content edit
09/08/2017	3.16	V8-T3-88–V8-T3-91	Content edit
09/08/2017	3.17	V8-T3-97	Content edit
09/08/2017	All	All	Revision date changed to September 2017

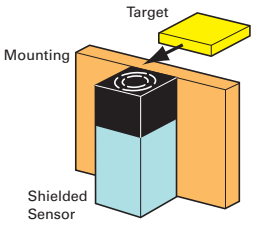
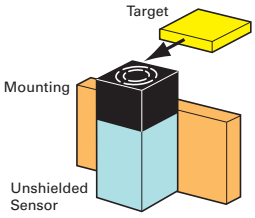
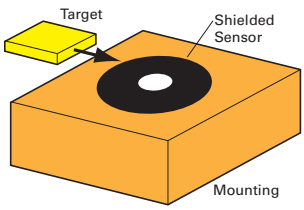
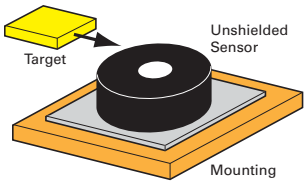
Powering Business Worldwide

Quick Reference Guide

Inductive Proximity Sensors

Sensing Application	Sensing Style	Size	Max Range	Product Family	Page
	Shielded tubular	4 mm	0.8 mm	Small Diameter Sensors	**V8-T3-65**
		5 mm	0.8 mm	Small Diameter Sensors	**V8-T3-65**
		6.5 mm	1 mm	Small Diameter Sensors	**V8-T3-65**
		8 mm	3 mm	Small Diameter Sensors	**V8-T3-65**
		12 mm	4 mm	iProx™ Sensors	**V8-T3-11**
			4 mm	E57P Performance Sensors	**V8-T3-18**, **V8-T3-24**
			4 mm	E57G General Purpose Sensors	**V8-T3-29**
		18 mm	8 mm	iProx Sensors	**V8-T3-11**
			8 mm	E57P Performance Sensors	**V8-T3-18**, **V8-T3-24**
			8 mm	E57G General Purpose Sensors	**V8-T3-29**
		30 mm	15 mm	iProx Sensors	**V8-T3-11**
			15 mm	E57P Performance Sensors	**V8-T3-18**, **V8-T3-24**
			15 mm	E57G General Purpose Sensors	**V8-T3-29**
	Unshielded tubular	6.5 mm	2 mm	Small Diameter	**V8-T3-65**
		8 mm	6 mm	Small Diameter	**V8-T3-65**
		12mm	10 mm	iProx Sensors	**V8-T3-11**
			8 mm	E57P Performance Sensors	**V8-T3-18**, **V8-T3-24**
			8 mm	E57G General Purpose Sensors	**V8-T3-29**
		18 mm	18 mm	iProx Sensors	**V8-T3-11**
			12 mm	E57P Performance Sensors	**V8-T3-18**, **V8-T3-24**
			12 mm	E57G General Purpose Sensors	**V8-T3-29**
		30 mm	29 mm	iProx Sensors	**V8-T3-11**
			22 mm	E57P Performance Sensors	**V8-T3-18**, **V8-T3-24**
			22 mm	E57G General Purpose Sensors	**V8-T3-29**
	Analog tubular	12 mm	8 mm	AccuProx™ Analog Sensors	**V8-T3-49**
		18 mm	15 mm	AccuProx Analog Sensors	**V8-T3-49**
		30 mm	25 mm	AccuProx Analog Sensors	**V8-T3-49**
	Shielded cube	40 x 40 x 40 mm	20 mm	E52 Cube Style Sensors	**V8-T3-79**
	Unshielded cube	40 x 40 x 40 mm	40 mm	E52 Cube Style Sensors	**V8-T3-79**

Inductive Proximity Sensors, continued

Sensing Application	Sensing Style	Size	Max Range	Product Family	Page
	Shielded limit switch	118 x 40 x 40 mm 114 x 39 x 38.4 mm	13 mm	E51 Modular Limit Switch Style Sensors E51 Limit Switch Style, Factory Sealed 6P+ Sensors E55 Limit Switch Style Sensors with Nonmetallic Housings	**V8-T3-88**, **V8-T3-97**, **V8-T3-86**
	Unshielded limit switch	118 x 40 x 40 mm 114 x 39 x 38.4 mm	24 mm	E51 Series E55 Series	**V8-T3-88**, **V8-T3-86**
	Shielded pancake	79 x 79 x 39 mm	40 mm	E56 Series	**V8-T3-71**
	Unshielded pancake	79 x 79 x 39 mm 110 x 110 x 41 mm 171.5 x 171.5 x 67.5 mm	100 mm	E56 Series	**V8-T3-71**

Technical Reference

Inductive Proximity Sensors

General

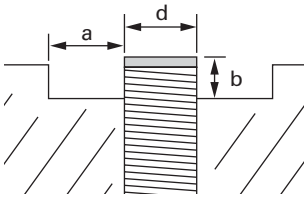
There are a number of factors which should be considered when applying induction proximity sensors. A detailed discussion of these factors can be found on **Page V8-T12-4**. Presented below are a few of the more important considerations for quick reference.

Mounting

Inductive proximity sensors are available in two classifications: shielded (also known as embeddable or flush mountable) and unshielded (non-embeddable or non-flush mountable). What these terms refer to is the distance to surrounding metal that the device can be mounted. In the case of a shielded sensor the device can be mounted with the sensor completely surrounded by metal.

In the case of an unshielded sensor, a metal free zone must be provided when mounting the sensor. The size of the metal free zone is dependent on both the size of the sensor and the type of sensing range it has, for example, standard or extended.

Mounting Ranges



Shielding	a	b
Standard Range		
Shielded	0	0
Unshielded	2 x Sn	Cap height
Extended Range		
Semi-shielded	Sn	d
Non-embeddable	2 x Sn	Cap height

Where **a** and **b** are the metal free dimensions.

When mounting the sensors, do not exceed the following recommended torque specifications.

Torque Specifications

Stainless Steel	Nickel-Plated Brass
12 mm Diameter	
35 lb-in (4.0 Nm)	20 lb-in (2.3 Nm)
18 mm Diameter	
70 lb-in (7.9 Nm)	70 lb-in (7.9 Nm)
30 mm Diameter	
70 lb-in (7.9 Nm)	70 lb-in (7.9 Nm)

Extended Range Sensors

Extended range proximity sensors by Eaton's Electrical Sector offer sensing distances almost three times greater than conventional devices. They are available in semi-shielded designs: mounted similar to an embeddable sensor—and non-embeddable designs requiring more metal free zone area than conventional unshielded sensors. All are available in a variety of circuits and terminations.

Target Material

When manufacturers of inductive proximity sensors state the sensing range of their devices, they are usually based upon a ferrous target made of carbon-rolled steel (IE FE 360) defined by ISO630. For example, in this product guide the E57P-18SPN5-C2 has a sensing range of 5 mm based upon a target of mild steel.

Sensing ranges to targets made of non-ferrous metals have to have a correction factor applied as listed in the table below. To use this table, multiply the sensing distance of the device by the factor given.

Example: The E57P-18SPN5-C2 has a sensing range of 5 mm. When used to sense a brass target, the sensing range becomes 2.25 mm (5 mm x 0.45).

Table of Correction Factors

Multiply sensing range of device by factor given below.

Correction Factors

	Sensor Size				
Target	**4–8 mm**	**12 mm**	**18 mm**	**30 mm**	**Limit Switch**
Stainless steel 400	0.90	0.90	1.0	1.0	1.0
Stainless steel 300	0.65	0.70	0.70	0.75	0.85
Brass	0.35	0.45	0.45	0.45	0.5
Aluminum	0.35	0.40	0.45	0.40	0.47
Copper	0.30	0.25	0.35	0.30	0.40

Target Size

Often overlooked when applying sensors is the fact that the manufacturer's stated sensing ranges are also dependent upon target size. The table below reflects the standard target sizes which were used to determine sensing ranges.

If targets are the same size or greater than standard, no reduction in sensing distance will occur. However, a smaller target size will result in a decrease in sensing range.

A general rule of thumb is that the target size shall be three times the range or the size of the sensor face, whichever is larger.

Standard Target Size ①

	Standard Sensing Range		Extended Sensing Range	
Target	**Shielded Devices**	**Unshielded Devices**	**Semi-Shield Devices**	**Non-Embeddable Devices**
4 mm	4 mm square	4 mm square	—	—
5 mm	5 mm square	5 mm square	—	—
6.5 mm	6.5 mm square	6.5 mm square	—	—
8 mm	8 mm square	8 mm square	—	—
12 mm	12 mm square	12 mm square	18 mm square	30 mm square
18 mm	18 mm square	24 mm square	36 mm square	60 mm square
30 mm	30 mm square	45 mm square	66 mm square	—
Limit switch	45 mm square	72 mm square	—	—

Note

① Targets are 1 mm thick.

Product Selection Guide

iProx

Page V8-T3-11

Overview

Designed to be the highest performing tubular inductive sensor. Standard features include extended sensing ranges, high noise-immunity, extreme durability and includes Autoconfigure Technology. Advanced features include output delay, speed detection and cloning with ProxView Software.

Applications

Automotive, machine tool, material handling where high sensing performance and inventory consolidation is a priority.

Product Features

Auto-configure technology automatically detects a sinking (NPN) or sourcing (PNP) connection and switches the sensor accordingly, without any user intervention

Optional computer programming cable and Windows-based ProxView configuration software makes it easy to customize sensors

Clone the sensor to match the characteristics of more than 4,800 competitive models, or configure it to match your specific application needs

Advanced programmable features such as dual outputs, output delay, speed detection and more

Technical Data and Specifications

Current ratings—
AC: 250 mA
DC: 300 mA

Enclosure ratings—
NEMA® 4, 4X, 6, 6P, 12, 13
IEC IP67, IP69K

Construction—
Stainless steel

Approvals

UL® Listed, E166051
UL Tested to Canadian safety standards
CE
RoHS Compliant

E57P Performance Series

Page V8-T3-18

Overview

High performance inductive sensors. Extended and standard ranges available.

Applications

Automotive, machine tool, material handling where high sensing performance and inventory consolidation is a priority.

Product Features

12, 18 and 30 mm diameters

Three-wire DC sensors

360° LED indicators standard

NO or NC outputs

Short-circuit protection

Resettable short-circuit protected and reverse polarity on select models

Robust stainless steel tubes, shock-resistant front caps, polycarbonate end bells, and impact-absorbing potting compound are resistant to physical and environmental abuse in high temperature, high pressure washdown and high shock and vibration applications

Technical Data and Specifications

Current ratings—
DC: 300 mA

Enclosure ratings—IP67, IP69K;
NEMA 4, 4X, 6, 6P

Construction—
Stainless steel housing and nuts

Approvals

UL Listed, E166051
UL Tested to Canadian safety standards
CE
RoHS Compliant

E57PS Performance Short Body

Page V8-T3-24

Overview

High performance inductive sensors with the ability to fit into tighter spaces.

Applications

Automotive, machine tool, material handling where high sensing performance and inventory consolidation is a priority.

Product Features

12, 18 and 30 mm diameters

Three-wire DC sensors

360° LED indicators standard

NO or NC outputs

Short-circuit protection

Resettable short-circuit protected and reverse polarity on select models

Robust stainless steel tubes, shock-resistant front caps, polycarbonate end bells, and impact-absorbing potting compound are resistant to physical and environmental abuse in high temperature, high pressure washdown and high shock and vibration applications

Technical Data and Specifications

Current ratings—
DC: 300 mA

Enclosure ratings—IP67, IP69K;
NEMA 4, 4X, 6, 6P

Construction—
Stainless steel housing and nuts

Approvals

UL Listed, E166051
UL Tested to Canadian safety standards
CE
RoHS Compliant

E57G General Purpose

Page V8-T3-29

Overview

This full-line, tubular proximity sensor family provides a cost-effective solution for high volume OEM use.

Applications

Machine tool detection, press applications, cam detection, material handling, valve and shaft position, automotive assembly.

Product Features

12, 18 and 30 mm diameters

Three-wire DC sensors

360° LED indicators standard

NO or NC outputs

Short-circuit protection

Resettable short-circuit protected and reverse polarity on select models

Robust stainless steel tubes, shock-resistant front caps, polycarbonate end bells, and impact-absorbing potting compound are resistant to physical and environmental abuse in high temperature, high pressure washdown and high shock and vibration applications

Technical Data and Specifications

Current ratings—
DC: 100 mA

Enclosure ratings—IP67;
NEMA 4, 4X, 6, 6P

Construction—
Stainless steel housing and nickel-brass nuts

Approvals

UL Listed, E166051
UL Tested to Canadian safety standards
CE
RoHS Compliant

E57 Two-Wire (AC, AC/DC, DC) Proximity

Page V8-T3-35

Overview

Various models available in two-wire configurations:
Stainless steel (AC, AC/DC)
Stainless steel short body (AC, AC/DC)
Nickel-brass (AC, DC)

Applications

Machine tool detection, press applications, cam detection, material handling, valve and shaft position, automotive assembly.

Product Features

12, 18 and 30 mm diameters
Two-wire AC, AC/DC, DC
Shielded and unshielded models
Standard and extended ranges
LED indicators
Cable and micro-connector
NO or NC outputs

Technical Data and Specifications

Stainless steel:
Current ratings—
500 mA maximum
Enclosure ratings—IP67, IP69K;
NEMA 4, 4X, 6, 6P, 12, 13
Nickel-Brass:
Current ratings—
200 mA (AC); 100 mA (DC)
Enclosure ratings—
IP69K, IP67

Approvals

RoHS Compliant
Stainless Steel:
UL Listed, E166051
UL Tested to Canadian safety standards
CE (AC/DC only)
Nickel-Brass:
CSA Certified, 224447
Products certified by CSA for US
CE (DC only)

AccuProx

Page V8-T3-49

Overview

AccuProx sensors feature analog outputs that change linearly as the target moves closer or further from the sensor face.

Applications

Part positioning, distance, size and thickness measurement, general inspection and error proofing (such as material imperfection or blemish detection), eccentricity or absolute angle detection, identification of different metals

Product Features

Extended linear sensing range of up to 25 mm—three times longer than standard tubular analog inductive sensors
Outputs available in current (4–20 or 0–20 mA) and voltage (0–10 V)
High output resolution and repeatability for applications requiring precision sensing performance
Robust stainless steel barrel, shock-resistant front cap, polycarbonate end bell and impact-absorbing potting compound
Ideal for extreme temperature or high pressure washdown environments

Technical Data and Specifications

Current ratings—
0–10 Vdc, 0–20 mA, 4–20 mA
Enclosure ratings—
NEMA 4, 4X, 6, 6P, 13
Construction—
Stainless steel

Approvals

UL Listed, E166051
UL Tested to Canadian safety standards
CE
RoHS Compliant

Ferrous Only Tubular

Page V8-T3-55

Overview

Sensors designed to detect only ferrous metals (steel/iron).

Applications

Workcell applications, automotive and aircraft production.

Product Features

18 mm diameters
Two-wire AC or three-wire DC
NO or NC outputs
Micro- and mini-pin terminations
LED indicators

Technical Data and Specifications

Current ratings—
AC: 500 mA continuous
DC: 200 mA continuous
Enclosure ratings—
NEMA 4, 4X, 6, 6P, 12, 13
IEC IP67
Construction—
Stainless steel

Approvals

CSA Certified
Products certified by CSA for US
CE
RoHS Compliant

Metal Face

Page V8-T3-58

Overview

Tough sensors with thick stainless steel sensing faces and barrels.

Applications

Metal cutting operations where damage to sensor face could occur.

Product Features

12, 18 and 30 mm diameters
Two-wire AC or three-wire DC
20 mil thick stainless steel face
303 stainless steel barrel
LED indicator
2-meter cable, micro- and mini-pin connections

Technical Data and Specifications

Current ratings—
AC: 500 mA continuous
DC: 200 mA continuous
Enclosure ratings—
NEMA 4, 4X, 6, 6P, 12, 13
IEC IP67
Construction—
Stainless steel

Approvals

CSA Certified
Products certified by CSA for US
CE
RoHS Compliant

High Current Output

Page V8-T3-62

Overview

DC sensors which can carry extremely large continuous inrush current.

Applications

Heavy-duty vehicles, cement mixers, lift trucks, front end loaders, farm equipment.

Product Features

30 mm diameter stainless steel housing

Solid-state output for 12 ampere continuous, 50 ampere inrush capacity

–40° to 158°F (–40° to 70°C) temperature range

NO and NC isolated outputs

Heavy gauge SJO cable

Technical Data and Specifications

Current ratings—
Varies by model

Enclosure ratings—
NEMA 4, 4X, 6, 6P, 12, 13
IEC IP67

Construction—
Stainless steel

Approvals

RoHS Compliant

RoHS COMPLIANT

Small Diameter

Page V8-T3-65

Overview

Small diameter and short body (4, 5, 6.5 and 8 mm) tubular housings for tight sensing applications.

Applications

Automation equipment, robotics, machine tool, counting, sorting

Product Features

Variety of diameters in stainless steel housings

PVC cable, micro- and nano-pin connections

LED indicators standard

Short overall lengths

Short circuit and reverse polarity protection

Technical Data and Specifications

Current ratings—
DC: 200 mA maximum

Enclosure ratings—
NEMA 4, 4X, 6, 6P, 12, 13
IEC IP67

Construction—
Stainless steel

Approvals

CE

RoHS Compliant

8 mm standard models only:
CSA Certified, 224447
Products certified by CSA for US

CE c SP us RoHS COMPLIANT

E56 Pancake

Page V8-T3-71

Overview

Self-contained sensors capable of sensing up to 3.94 inches (100 mm).

Applications

Oil rig operations, floor conveyors, automotive assembly, overhead cranes

Product Features

40, 50, 70 and 100 mm sensing distances

Four-wire DC models have complementary outputs (1 NO/1 NC)

Four-wire DC models use auto-configure technology, which allows the sensor to automatically adapt for NPN or PNP without user intervention

Available in two-wire AC versions

Power and output LED indicator

Quick disconnect option

Short-circuit protected in DC

Longest sensing distances available

Technical Data and Specifications

Current ratings—
AC: 500 mA continuous
DC: 200 mA continuous

Enclosure ratings—
NEMA 4, 4X, 12, 13
(some models also rated NEMA 6)
IEC IP66

Construction—
PPS

Approvals

UL Listed, E166051 (DC models only)

UL tested to Canadian safety standards

CE (DC models only)

RoHS Compliant

c UL us LISTED CE RoHS COMPLIANT

Tubular, Nonmetallic Housing

Page V8-T3-76

Overview

Tubular sensors with nonmetallic housings offer high corrosion resistance.

Applications

Food processing lines, high washdown environments

Product Features

12, 18 and 30 mm diameters shielded and unshielded sensing

Normally open or closed outputs

AC and DC voltages

Tough ABS plastic housing

Output LED on all models

Technical Data and Specifications

Current ratings—
AC: 150 mA
DC: 200 mA

Enclosure ratings—
NEMA 3, 3S, 4, 4X, 13
IEC IP66

Construction—
ABS plastic

Approvals

CE

RoHS Compliant

E52 Cube Style

Page V8-T3-79

Overview

A family of industry-standard, cube-sized inductive sensors with long range capabilities.

Applications

Automotive, manufacturing, machinery OEMs

Product Features

Long inductive proximity ranges available (up to 40 mm sensing distance)

Four-wire DC models have complementary outputs (1 NO/1 NC)

Four-wire DC models use auto-configure technology, which allows the sensor to automatically adapt for NPN or PNP without user intervention

Robust design featuring vibration and impact-absorbing potting compound

Ideal for extreme temperatures or high pressure washdown environments

Technical Data and Specifications

Current ratings—
DC: 300 mA maximum

Enclosure ratings—
NEMA 4, 4X, 6, 6P, 12, 13
IEC IP67

Construction—
Zinc alloy/PPS, PL

Approvals

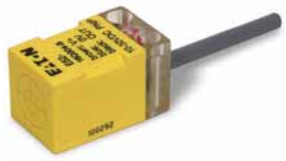
UL Listed, E166051

UL tested to Canadian safety standards

CE

RoHS Compliant

E52 Rectangular Style



Page V8-T3-83

Overview

A variety of small rectangular sensors for limited space applications.

Applications

Tight applications where conventional sensor are too large

Product Features

Variety of housing styles R12, R18, Q16, Q25

10 to 30 Vdc

NPN and PNP output

Short-circuit protection

LED indicator for output status

Technical Data and Specifications

Current ratings—
DC: 100 mA maximum

Enclosure ratings—
NEMA 1, 2, 3, 3S, 4, 12
IEC IP66

Construction—
PBT composition housing

Approvals

CE (except E52RAL)

RoHS Compliant

E55 Limit Switch Style, Nonmetallic Housing

Page V8-T3-86

Overview

These nonmetallic sensors provide corrosion resistance in a limit switch style housing.

Applications

Food processing lines, high washdown environments

Product Features

5 position head can be top mounted or in any of four side positions

Long sensing ranges up to 40 mm

Normally open or closed outputs

AC voltages

Tough PBT resin housing

Technical Data and Specifications

Current ratings—
AC: 400 mA

Enclosure ratings—
NEMA 4, 4X, 6, 12, 13
IEC IP67

Construction—
PBT resin

Approvals

CE

RoHS Compliant

E51 Modular Switch Style, Modular

Page V8-T3-88

Overview

Modular design allows maximum use of inventories in these limit switch style housings. Solid-state circuitry in a variety of sensing ranges.

Applications

Machine tool, punch presses, automotive, conveyor systems

Product Features

Modular heads, switch bodies, receptacles

Shielded or unshielded sensing ranges

Solid-state electronics

Viton gasket seals

LED indicators for power and output status

Top and side sensing heads

Alternate frequency for side by side operation

Components individually labeled for easy identification

Technical Data and Specifications

Current ratings—
AC: 1 ampere continuous
DC: 0.6 ampere continuous

Enclosure ratings—
NEMA 3, 3S, 4, 4X, 6, 6P, 12, 13
IEC IP67

Class I, Class II, Division 2
Groups A, B, C, D, F and G; Class III

Construction—
Die cast zinc
Gasket material: Viton

Approvals

UL Listed, E166051, E183975

CSA Certified, 50513

RoHS Compliant

E51 Limit Switch Style, Factory Sealed 6P +

Page V8-T3-97

Overview

Completely epoxy filled in unitized, one piece limit switch style construction for reliable performance under the most adverse of environmental conditions.

Applications

All corrosive environments: Coolants/ cutting oils, automotive applications

Product Features

One piece housing on switch body/ receptacle

Head and housing totally epoxy encapsulated

Side sensing head can be unfastened and moved to any of four positions

Quick disconnect options

Corrosive resistant epoxy coated housing

Technical Data and Specifications

Current ratings—
AC: 1 ampere continuous
DC: 0.6 ampere continuous

Enclosure ratings—
NEMA 3, 3S, 4, 4X, 6, 6P, 12, 13
IEC IP67

Construction—
Die cast zinc
Gasket material: Viton®

Approvals

UL Listed, E166051

CSA Certified, 50513

RoHS Compliant

iProx Sensors

Contents

iProx Sensors

Product Description

The iProx represents the highest performance, most versatile tubular inductive sensor offered by Eaton's Electrical Sector. By utilizing an embedded micro-processor and exclusive SmartSense™ technology, iProx can sense up to three times farther than typical sensors of its class, while providing an unheard-of level of customization.

Both shielded and unshielded versions of iProx feature extended sensing ranges. This allows the sensor to be mounted farther from the target, thereby reducing the potential for target impacts and increasing the sensing reliability of your application.

The iProx also includes a wide range of advanced features that can be enabled via optional programming tools. Using the ProxView Windows-based software package, an entirely custom sensor can be programmed to perfectly fit an application.

Sensor characteristics, such as sensing range, can be customized down to the nearest tenth of a millimeter. Outputs can be changed from NO to NC. The iProx even features built-in timing delays and speed detection logic—no PLC programming is necessary.

With extended sensing range, quality construction and the ability to adapt to its environment, iProx is the ideal choice for even the most demanding inductive sensing applications.

Application Description

Typical Applications

- Automotive
- Machine tool
- Material handling
- Metalworking

Features

- Available in AC two-wire, DC three-wire and unique DC four-wire with complementary (NO-NC) or dual NO outputs
- Reliably detect metal targets at up to three times the range of conventional shielded or unshielded tubular inductive sensors
- Quality construction using a stainless steel barrel, 360-degree dual-color LED indicator, Ryton® impact-resistant face cap and vibration-absorbing potting compound
- Auto-configure technology automatically detects a sinking (NPN) or sourcing (PNP) connection and switches the sensor accordingly, without any user intervention
- Exclusive SmartSense embedded microprocessor technology allows for customizable range, band sensing, nuisance metal rejection, timing delays and over/under speed detection
- Optional computer programming cable and Windows-based ProxView configuration software makes it easy to customize sensors
- Withstands high electrical noise (up to 20 V/m)
- Resistant to extreme temperatures (–40 °F [–40 °C])

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

Standards and Certifications

- UL Listed, E166051
- UL Tested to Canadian safety standards
- CE
- RoHS Compliant

c UL us LISTED CE RoHS COMPLIANT

⚠ 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

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

iProx Sensors

Note: Custom iProx models can also be ordered directly from the factory with pre-set ranges, outputs and connectors. Consult the Eaton Application Engineers at 1-800-426-9184 for more information.

3

Two-Wire Sensors

	Operating Voltage	Sensing Range	Shielding	Connection Type ①	NO Output Catalog Number ②	NC Output Catalog Number ②
Standard Range	**12 mm Diameter**					
	20–132 Vac	4 mm	Shielded	3-pin micro AC connector	**E59-M12A105A01-A1** ♣	**E59-M12A105A01-A2** ♣
				3-pin micro AC pigtail ③	**E59-M12A105A01P-A1** ♣	**E59-M12A105A01P-A2** ♣
				3-pin mini AC pigtail ③	**E59-M12A105A01PB-A1** ♣	**E59-M12A105A01PB-A2** ♣
				2-meter cable	**E59-M12A105C02-A1**	**E59-M12A105C02-A2**
Extended Range		10 mm	Unshielded	3-pin micro AC connector	**E59-M12C110A01-A1** ♣	**E59-M12C110A01-A2** ♣
				3-pin micro AC pigtail ③	**E59-M12C110A01P-A1** ♣	**E59-M12C110A01P-A2** ♣
				3-pin mini AC pigtail ③	**E59-M12C110A01PB-A1** ♣	**E59-M12C110A01PB-A2** ♣
				2-meter cable	**E59-M12C110C02-A1**	**E59-M12C110C02-A2**
Standard Range	**18 mm Diameter**					
	20–132 Vac	8 mm	Shielded	3-pin micro AC connector	**E59-M18A109A01-A1** ♣	**E59-M18A109A01-A2** ♣
				3-pin micro AC pigtail ③	**E59-M18A109A01P-A1** ♣	**E59-M18A109A01P-A2** ♣
				3-pin mini AC pigtail ③	**E59-M18A109A01PB-A1** ♣	**E59-M18A109A01PB-A2** ♣
				2-meter cable	**E59-M18A109C02-A1**	**E59-M18A109C02-A2**
Extended Range		18 mm	Unshielded	3-pin micro AC connector	**E59-M18C118A01-A1** ♣	**E59-M18C118A01-A2** ♣
				3-pin micro AC pigtail ③	**E59-M18C118A01P-A1** ♣	**E59-M18C118A01P-A2** ♣
				3-pin mini AC pigtail ③	**E59-M18C118A01PB-A1** ♣	**E59-M18C118A01PB-A2** ♣
				2-meter cable	**E59-M18C118C02-A1**	**E59-M18C118C02-A2**
Standard Range	**30 mm Diameter**					
	20–132 Vac	15 mm	Shielded	3-pin micro AC connector	**E59-M30A115A01-A1** ♣	**E59-M30A115A01-A2** ♣
				3-pin micro AC pigtail ③	**E59-M30A115A01P-A1** ♣	**E59-M30A115A01P-A2** ♣
				3-pin mini AC pigtail ③	**E59-M30A115A01PB-A1** ♣	**E59-M30A115A01PB-A2** ♣
				2-meter cable	**E59-M30A115C02-A1**	**E59-M30A115C02-A2**
Extended Range		29 mm	Unshielded	3-pin micro AC connector	**E59-M30C129A01-A1** ♣	**E59-M30C129A01-A2** ♣
				3-pin micro AC pigtail ③	**E59-M30C129A01P-A1** ♣	**E59-M30C129A01P-A2** ♣
				3-pin mini AC pigtail ③	**E59-M30C129A01PB-A1** ♣	**E59-M30C129A01PB-A2** ♣
				2-meter cable	**E59-M30C129C02-A1**	**E59-M30C129C02-A2**

Notes

♣ See listing of compatible connector cables on **Page V8-T3-15**.

① For sensors with custom cable lengths or PUR jackets, contact Application Engineering at 1-800-426-9184.

② Sensors are ordered with pre-set outputs from the factory, but can be later programmed either NO or NC using the ProxView software.

③ Standard pigtail cable length is 12 in.

Note: Custom iProx models can also be ordered directly from the factory with pre-set ranges, outputs and connectors. Consult the Eaton Application Engineers at 1-800-426-9184 for more information.

Three-Wire Sensors

	Operating Voltage	Sensing Range	Shielding	Connection Type ①	NO Output Catalog Number ②	NC Output Catalog Number ②
Standard Range	**12 mm Diameter**					
	6–48 Vdc	4 mm	Shielded	4-pin micro DC connector	**E59-M12A105D01-D1** ⠿	**E59-M12A105D01-D2** ⠿
				4-pin micro DC pigtail ③	**E59-M12A105D01P-D1** ⠿	**E59-M12A105D01P-D2** ⠿
				2-meter cable	**E59-M12A105C02-D1**	**E59-M12A105C02-D2**
Extended Range		10 mm	Unshielded	4-pin micro DC connector	**E59-M12C110D01-D1** ⠿	**E59-M12C110D01-D2** ⠿
				4-pin micro DC pigtail ③	**E59-M12C110D01P-D1** ⠿	**E59-M12C110D01P-D2** ⠿
				2-meter cable	**E59-M12C110C02-D1**	**E59-M12C110C02-D2**
Standard Range	**18 mm Diameter**					
	6–48 Vdc	8 mm	Shielded	4-pin micro DC connector	**E59-M18A108D01-D1** ⠿	**E59-M18A108D01-D2** ⠿
				4-pin micro DC pigtail ③	**E59-M18A108D01P-D1** ⠿	**E59-M18A108D01P-D2** ⠿
				2-meter cable	**E59-M18A108C02-D1**	**E59-M18A108C02-D2**
Extended Range		18 mm	Unshielded	4-pin micro DC connector	**E59-M18C116D01-D1** ⠿	**E59-M18C116D01-D2** ⠿
				4-pin micro DC pigtail ③	**E59-M18C116D01P-D1** ⠿	**E59-M18C116D01P-D2** ⠿
				2-meter cable	**E59-M18C116C02-D1**	**E59-M18C116C02-D2**
Standard Range	**30 mm Diameter**					
	6–48 Vdc	15 mm	Shielded	4-pin micro DC connector	**E59-M30A115D01-D1** ⠿	**E59-M30A115D01-D2** ⠿
				4-pin micro DC pigtail ③	**E59-M30A115D01P-D1** ⠿	**E59-M30A115D01P-D2** ⠿
				2-meter cable	**E59-M30A115C02-D1**	**E59-M30A115C02-D2**
Extended Range		29 mm	Unshielded	4-pin micro DC connector	**E59-M30C129D01-D1** ⠿	**E59-M30C129D01-D2** ⠿
				4-pin micro DC pigtail ③	**E59-M30C129D01P-D1** ⠿	**E59-M30C129D01P-D2** ⠿
				2-meter cable	**E59-M30C129C02-D1**	**E59-M30C129C02-D2**

Notes

⠿ See listing of compatible connector cables on **Page V8-T3-15**.

① For sensors with custom cable lengths or PUR jackets, contact Application Engineering at 1-800-426-9184.

② Sensors are ordered with pre-set outputs from the factory, but can be later programmed either NO or NC using the ProxView software.

③ Standard pigtail cable length is 12 in.

3

Complementary and Dual Output Sensors

Four-Wire Sensors

	Operating Voltage	Sensing Range	Shielding	Output Type	Connection Type	Complementary Output (1NO-1NC) Catalog Number	Dual NO Output Catalog Number ①
Standard Range	**12 mm Diameter**						
	6–48 Vdc	4 mm	Shielded	NPN (sinking)	4-pin micro DC connector	**E59-M12A105D01-D3NN** ⠿	**E59-M12A105D01-D1NN** ⠿
					2-meter cable	**E59-M12A105C02-D3NN**	**E59-M12A105C02-D1NN**
				PNP (sourcing)	4-pin micro DC connector	**E59-M12A105D01-D3PP** ⠿	**E59-M12A105D01-D1PP** ⠿
					2-meter cable	**E59-M12A105C02-D3PP**	**E59-M12A105C02-D1PP**
Extended Range		10 mm	Unshielded	NPN (sinking)	4-pin micro DC connector	**E59-M12C110D01-D3NN** ⠿	**E59-M12C110D01-D1NN** ⠿
					2-meter cable	**E59-M12C110C02-D3NN**	**E59-M12C110C02-D1NN**
				PNP (sourcing)	4-pin micro DC connector	**E59-M12C110D01-D3PP** ⠿	**E59-M12C110D01-D1PP** ⠿
					2-meter cable	**E59-M12C110C02-D3PP**	**E59-M12C110C02-D1PP**
Standard Range	**18 mm Diameter**						
	6–48 Vdc	8 mm	Shielded	NPN (sinking)	4-pin micro DC connector	**E59-M18A108D01-D3NN** ⠿	**E59-M18A108D01-D1NN** ⠿
					2-meter cable	**E59-M18A108C02-D3NN**	**E59-M18A108C02-D1NN**
				PNP (sourcing)	4-pin micro DC connector	**E59-M18A108D01-D3PP** ⠿	**E59-M18A108D01-D1PP** ⠿
					2-meter cable	**E59-M18A108C02-D3PP**	**E59-M18A108C02-D1PP**
Extended Range		18 mm	Unshielded	NPN (sinking)	4-pin micro DC connector	**E59-M18C116D01-D3NN** ⠿	**E59-M18C116D01-D1NN** ⠿
					2-meter cable	**E59-M18C116C02-D3NN**	**E59-M18C116C02-D1NN**
				PNP (sourcing)	4-pin micro DC connector	**E59-M18C116D01-D3PP** ⠿	**E59-M18C116D01-D1PP** ⠿
					2-meter cable	**E59-M18C116C02-D3PP**	**E59-M18C116C02-D1PP**
Standard Range	**30 mm Diameter**						
	6–48 Vdc	15 mm	Shielded	NPN (sinking)	4-pin micro DC connector	**E59-M30A115D01-D3NN** ⠿	**E59-M30A115D01-D1NN** ⠿
					2-meter cable	**E59-M30A115C02-D3NN**	**E59-M30A115C02-D1NN**
				PNP (sourcing)	4-pin micro DC connector	**E59-M30A115D01-D3PP** ⠿	**E59-M30A115D01-D1PP** ⠿
					2-meter cable	**E59-M30A115C02-D3PP**	**E59-M30A115C02-D1PP**
Extended Range		29 mm	Unshielded	NPN (sinking)	4-pin micro DC connector	**E59-M30C129D01-D3NN** ⠿	**E59-M30C129D01-D1NN** ⠿
					2-meter cable	**E59-M30C129C02-D3NN**	**E59-M30C129C02-D1NN**
				PNP (sourcing)	4-pin micro DC connector	**E59-M30C129D01-D3PP** ⠿	**E59-M30C129D01-D1PP** ⠿
					2-meter cable	**E59-M30C129C02-D3PP**	**E59-M30C129C02-D1PP**

Notes

⠿ See listing of compatible connector cables on **Page V8-T3-15**.

① At this time, iProx Complementary and Dual Output models are not available with auto-sink/source detection. Therefore, PNP (sourcing) and NPN (sinking) models must be ordered separately.

Compatible Connector Cables

Standard Cables ①

	Current Rating at 600 V	Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number
Micro-Style Straight Female	**Micro-Style, Straight Female**							
	—	AC	3-pin, 3-wire	22 AWG	6.0 ft (2m)	 1-Green 2-Red/Black 3-Red/White	**CSAS3F3CY2202**	**CSAS3F3RY2202**
	—	DC	4-pin, 4-wire	22 AWG	6.0 ft (2m)	 1-Brown 2-White 3-Blue 4-Black	**CSDS4A4CY2202**	**CSDS4A4RY2202**
Mini-Style Straight Female	**Mini-Style, Straight Female**						**Catalog Number**	
	13 A	—	3-pin	16 AWG	6 ft (2m)	 1-Green 2-Black 3-White	**CSMS3F3CY1602**	

Accessories

iProx Sensors

	Description	Catalog Number
Software 	Step-by-step programming software required to program iProx. Compatible with Microsoft Windows® and Windows® Mobile devices.	**E59SW1**
Cable 	The iProx programming cable is used to program individual iProx sensors, providing a connection between the computer and the sensor. Connects to computer via a serial (RS-232) or USB port. (USB connection requires an adapter which is included with purchase.)	**E59RP1**
Labels 	Field applied labels for iProx sensor (100 pcs)	**E59LABEL**

Note

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

3

Starter Kit

iProx Starter Kits

Description	Catalog Number
Interested in custom programming iProx sensors to fit your application?	
These kits include everything needed to get the most out of iProx: a sensor, a programming cable (E59RP1), a micro connector cable (CSDS4A4CY2202) and ProxView software on CD-ROM (E59SW1).	
Starter kit includes:	
12 mm AC unshielded iProx sensor (E59-M12C110A01-A1)	**E5912ACKIT**
12 mm DC unshielded iProx sensor (E59-M12C110D01-D1)	**E5912DCKIT**
18 mm AC unshielded iProx sensor (E59-M18C118A01-A1)	**E5918ACKIT**
18 mm DC unshielded iProx sensor (E59-M18C116D01-D1)	**E5918DCKIT**
30 mm AC unshielded iProx sensor (E59-M30C129A01-A1)	**E5930ACKIT**
30 mm DC unshielded iProx sensor (E59-M30C129D01-D1)	**E5930DCKIT**

Technical Data and Specifications

iProx Sensors

Description	Two-Wire Sensors	Three-Wire Sensors
Input voltage	20–132 Vac	6–48 Vdc
Load current	250 mA	300 mA
Leakage current	≤1.7 mA at 32 °F (0 °C), 2.0 mA at –40 °F (–40 °C)	≤150 µA
Voltage drop	<5 Vac	≤2.5 Vdc
Burden current	—	≤15 mA
Protection	None	Auto reset
Switching hysteresis	<15% rated sensing distance	<15% rated sensing distance
Repeat accuracy	Shielded models: <1% sensing distance; Unshielded models: <3% sensing distance	Shielded models: <1% sensing distance; Unshielded models: <3% sensing distance
Surge capacity	3 A/30 ms	—
Temperature range	–40 to 158 °F (–40 to 70 °C)	–40 to 158 °F (–40 to 70 °C)
Material of construction	303 stainless steel; end bells: polycarbonate; face caps: Ryton®; cable: AWM style 20387 (PVC)	303 stainless steel; end bells: polycarbonate; face caps: Ryton®; cable: AWM style 20387 (PVC)
Vibration and shock	Vibration: 10 to 55 Hz, 1 mm amplitude, IEC 60068-2-6; shock: 30 g, 11 ms per IEC 68-2-27	Vibration: 10 to 55 Hz, 1 mm amplitude, IEC 60068-2-6; shock: 30 g, 11 ms per IEC 68-2-27
Indicator LED	360° viewable LED	360° viewable LED
Enclosure ratings	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67) IP69K ①	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67) IP69K ①

Response Time ②

		Three-Wire Sensors					
	Two-Wire Sensors	Shielded			Unshielded		
Description	All Two-Wire Models	12 mm	18 mm	30 mm	12 mm	18 mm	30 mm
Factory default mode	Shipped in "Side by Side Mode" by default (20 V/m)	580 Hz (10 V/m)	390 Hz (10 V/m)	240 Hz (10 V/m)	300 Hz (10 V/m)	150 Hz (10 V/m)	145 Hz (10 V/m)
Side by side ③	30 Hz (10 V/m)	50 Hz (20 V/m)	50 Hz (20 V/m)	50 Hz (20 V/m)	50 Hz (20 V/m)	50 Hz (20 V/m)	50 Hz (20 V/m)
High noise immunity mode	10 Hz (>20 V/m)	10 Hz (>20 V/m)	10 Hz (>20 V/m)	10 Hz (>20 V/m)	10 Hz (>20 V/m)	10 Hz (>20 V/m)	10 Hz (>20 V/m)

Notes

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

① Our products conform to NEMA® tests as indicated, however, some severe washdown applications can exceed these NEMA test specifications.

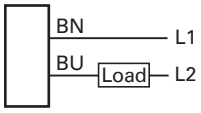
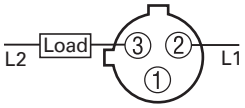
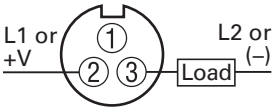
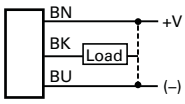
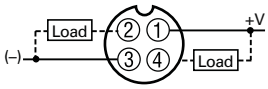
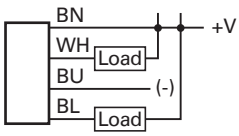
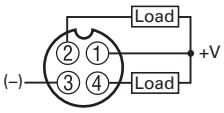
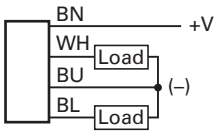
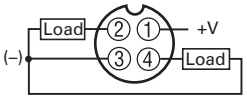
② iProx sensors may be programmed to perform in side by side or high noise immunity applications using the iProx programming cable (E59RP1) and ProxView software (E59SW1).

③ Use the side by side response time parameter when using the iProx Tray Programmer (E59TP1), iProx programming cable (E59RP1) and ProxView software (E59SW1).

Wiring Diagrams

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

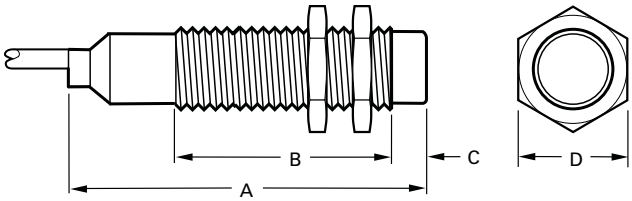
iProx Sensors

Operating Voltage	Output	Cable Models	Connector Models (Face View Male Shown) Micro	Mini
Two-Wire Sensors				
20–132 Vac	NO and NC			
Three-Wire Sensors				
6–48 Vdc	NO and NC (NPN and PNP) ①	② 	② 	—
Four-Wire Dual Output and Complementary Sensors				
6–48 Vdc	NO and NC (NPN)	③ 	③ 	—
	NO and NC (PNP)	③ 	③ 	—

Dimensions

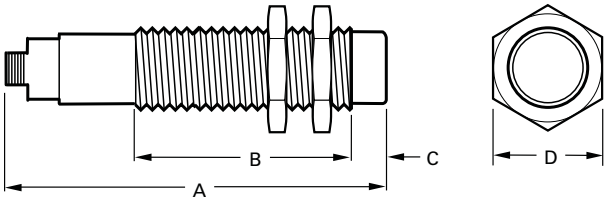
Approximate Dimensions in Inches (mm)

Cable Models



Size	Shielding	A	B	C	D
12 mm	Shielded	2.46 (62.4)	1.98 (50.3)	0.02 (0.5)	0.67 (17)
	Unshielded	2.46 (62.4)	1.64 (41.6)	0.36 (9)	0.67 (17)
18 mm	Shielded	2.54 (64.5)	2.00 (50.9)	0.02 (0.5)	0.94 (24)
	Unshielded	2.54 (64.5)	1.47 (37.4)	0.55 (14)	0.94 (24)
30 mm	Shielded	2.74 (69.6)	2.13 (54.1)	0.03 (0.75)	1.41 (36)
	Unshielded	2.74 (69.6)	1.41 (35.8)	0.75 (19)	1.41 (36)

Micro-Connector Models



Size	Shielding	A	B	C	D
12 mm	Shielded	2.71 (68.7)	1.98 (50.3)	0.02 (0.5)	0.67 (17)
	Unshielded	2.71 (68.7)	1.64 (41.6)	0.36 (9)	0.67 (17)
18 mm	Shielded	2.73 (69.3)	2.00 (50.9)	0.02 (0.5)	0.94 (24)
	Unshielded	2.73 (69.3)	1.47 (37.4)	0.55 (14)	0.94 (24)
30 mm	Shielded	2.92 (74.1)	2.13 (54.1)	0.03 (0.75)	1.41 (36)
	Unshielded	2.92 (74.1)	1.41 (35.8)	0.75 (19)	1.41 (36)

Notes

① The three-wire DC version of iProx automatically configures itself to NPN or PNP based on field wiring. No user intervention is required.
② Pin numbers 2 and 4 are internally jumpered together. Either pin may be used.
③ The complementary (1NO-1NC) output models feature the NC output on pin 2 (white).

3

E57P Performance Series Sensors

Contents

E57P Performance Series Sensors

Product Description

For sensing applications requiring more demanding specifications, the new E57P Performance series incorporates premium features without the premium price. With its stainless steel tubular body, IP69K rating, wide temperature range (down to –40 °C), fast switching speed and laser-etched markings, the E57P series provides value at a low price point.

Features

- 360° LED indicator
- Stainless steel tube
- 10–48 Vdc operating voltage
- Short-circuit protection
- –40 to 70 °C temperature range
- IP69K environmental rating
- Durable laser-engraved label
- Available in cable and micro-connector styles

Standards and Certifications

- UL Listed, E166051
- UL Tested to Canadian safety standards
- CE
- RoHS Compliant

c UL us LISTED CE RoHS COMPLIANT

⚠ 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

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

E57P Performance Sensors

Three-Wire Sensors

	Operating Voltage	Sensing Range (Sn)	Shielding	Connection Type ①	NO Output Catalog Number	NC Output Catalog Number
12 mm 	**12 mm Diameter End Sensing**					
	10–48 Vdc	2 mm (standard range)	Shielded (PNP)	2-meter cable	**E57P-12SPN2-C2**	**E57P-12SPC2-C2**
				4-pin micro DC connector	**E57P-12SPN2-Q**	**E57P-12SPC2-Q**
			Shielded (NPN)	2-meter cable	**E57P-12SNN2-C2**	**E57P-12SNC2-C2**
				4-pin micro DC connector	**E57P-12SNN2-Q**	**E57P-12SNC2-Q**
		4 mm (standard range)	Unshielded (PNP)	2-meter cable	**E57P-12UPN4-C2**	**E57P-12UPC4-C2**
				4-pin micro DC connector	**E57P-12UPN4-Q**	**E57P-12UPC4-Q**
			Unshielded (NPN)	2-meter cable	**E57P-12UNN4-C2**	**E57P-12UNC4-C2**
				4-pin micro DC connector	**E57P-12UNN4-Q**	**E57P-12UNC4-Q**
		4 mm (extended range)	Shielded (PNP)	2-meter cable	**E57P-12SPN4-C2**	**E57P-12SPC4-C2**
				4-pin micro DC connector	**E57P-12SPN4-Q**	**E57P-12SPC4-Q**
			Shielded (NPN)	2-meter cable	**E57P-12SNN4-C2**	**E57P-12SNC4-C2**
				4-pin micro DC connector	**E57P-12SNN4-Q**	**E57P-12SNC4-Q**
		8 mm (extended range)	Unshielded (PNP)	2-meter cable	**E57P-12UPN8-C2**	**E57P-12UPC8-C2**
				4-pin micro DC connector	**E57P-12UPN8-Q**	**E57P-12UPC8-Q**
			Unshielded (NPN)	2-meter cable	**E57P-12UNN8-C2**	**E57P-12UNC8-C2**
				4-pin micro DC connector	**E57P-12UNN8-Q**	**E57P-12UNC8-Q**
18 mm 	**18 mm Diameter End Sensing**					
	10–48 Vdc	5 mm (standard range)	Shielded (PNP)	2-meter cable	**E57P-18SPN5-C2**	**E57P-18SPC5-C2**
				4-pin micro DC connector	**E57P-18SPN5-Q**	**E57P-18SPC5-Q**
			Shielded (NPN)	2-meter cable	**E57P-18SNN5-C2**	**E57P-18SNC5-C2**
				4-pin micro DC connector	**E57P-18SNN5-Q**	**E57P-18SNC5-Q**
		8 mm (standard range)	Unshielded (PNP)	2-meter cable	**E57P-18UPN8-C2**	**E57P-18UPC8-C2**
				4-pin micro DC connector	**E57P-18UPN8-Q**	**E57P-18UPC8-Q**
			Unshielded (NPN)	2-meter cable	**E57P-18UNN8-C2**	**E57P-18UNC8-C2**
				4-pin micro DC connector	**E57P-18UNN8-Q**	**E57P-18UNC8-Q**
		8 mm (extended range)	Shielded (PNP)	2-meter cable	**E57P-18SPN8-C2**	**E57P-18SPC8-C2**
				4-pin micro DC connector	**E57P-18SPN8-Q**	**E57P-18SPC8-Q**
			Shielded (NPN)	2-meter cable	**E57P-18SNN8-C2**	**E57P-18SNC8-C2**
				4-pin micro DC connector	**E57P-18SNN8-Q**	**E57P-18SNC8-Q**
		12 mm (extended range)	Unshielded (PNP)	2-meter cable	**E57P-18UPN12-C2**	**E57P-18UPC12-C2**
				4-pin micro DC connector	**E57P-18UPN12-Q**	**E57P-18UPC12-Q**
			Unshielded (NPN)	2-meter cable	**E57P-18UNN12-C2**	**E57P-18UNC12-C2**
				4-pin micro DC connector	**E57P-18UNN12-Q**	**E57P-18UNC12-Q**

Notes

See listing of compatible connector cables on **Page V8-T3-20**.

① For cable lengths longer than 2 meters, add the number of the desired length in meters to the end of the listed catalog number (for catalog numbers ending with a number, add an **S** and then the length). Examples for a 5-meter cable: E57-18LE12-A becomes E57-18LE12-A**5**; E57LAL12A2 becomes E57LAL12A2**S5**.

Three-Wire Sensors, continued

30 mm

Operating Voltage	Sensing Range (Sn)	Shielding	Connection Type ①	NO Output Catalog Number	NC Output Catalog Number
30 mm Diameter End Sensing					
10–48 Vdc	10 mm (standard range)	Shielded (PNP)	2-meter cable	**E57P-30SPN10-C2**	**E57P-30SPC10-C2**
			4-pin micro DC connector	**E57P-30SPN10-Q**	**E57P-30SPC10-Q**
		Shielded (NPN)	2-meter cable	**E57P-30SNN10-C2**	**E57P-30SNC10-C2**
			4-pin micro DC connector	**E57P-30SNN10-Q**	**E57P-30SNC10-Q**
	15 mm (standard range)	Unshielded (PNP)	2-meter cable	**E57P-30UPN15-C2**	**E57P-30UPC15-C2**
			4-pin micro DC connector	**E57P-30UPN15-Q**	**E57P-30UPC15-Q**
		Unshielded (NPN)	2-meter cable	**E57P-30UNN15-C2**	**E57P-30UNC15-C2**
			4-pin micro DC connector	**E57P-30UNN15-Q**	**E57P-30UNC15-Q**
	15 mm (extended range)	Shielded (PNP)	2-meter cable	**E57P-30SPN15-C2**	**E57P-30SPC15-C2**
			4-pin micro DC connector	**E57P-30SPN15-Q**	**E57P-30SPC15-Q**
		Shielded (NPN)	2-meter cable	**E57P-30SNN15-C2**	**E57P-30SNC15-C2**
			4-pin micro DC connector	**E57P-30SNN15-Q**	**E57P-30SNC15-Q**
	22 mm (extended range)	Unshielded (PNP)	2-meter cable	**E57P-30UPN22-C2**	**E57P-30UPC22-C2**
			4-pin micro DC connector	**E57P-30UPN22-Q**	**E57P-30UPC22-Q**
		Unshielded (NPN)	2-meter cable	**E57P-30UNN22-C2**	**E57P-30UNC22-C2**
			4-pin micro DC connector	**E57P-30UNN22-Q**	**E57P-30UNC22-Q**

Compatible Connector Cables

Standard Cables ①

Micro-Style Straight Female

Current Rating at 600 V	Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number
Micro-Style, Straight Female							
—	DC	4-pin, 4-wire	22 AWG	6.0 ft (2m)	① ② ④ ③ 1-Brown 2-White 3-Blue 4-Black	**CSDS4A4CY2202**	**CSDS4A4RY2202**

Accessories

E57P Performance Sensors

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

Notes

See listing of compatible connector cables on **Page V8-T3-20**.

① For cable lengths longer than 2 meters, add the number of the desired length in meters to the end of the listed catalog number (for catalog numbers ending with a number, add an **S** and then the length). Examples for a 5-meter cable: E57-18LE12-A becomes E57-18LE12-A**5**; E57LAL12A2 becomes E57LAL12A2**S5**.

② For a full selection of connector cables, see **Tab 10**, **section 10.1**.

Technical Data and Specifications

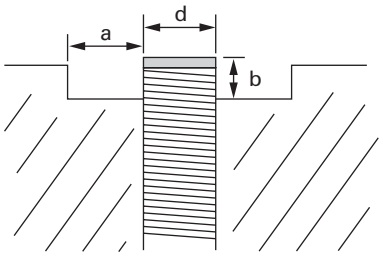
E57P Performance Sensors

Description	Performance Three-Wire DC Sensors
Operating voltage	10–48 Vdc
Output current (continuous)	300 mA
Switching frequency [Hz]	Standard range: 12 mm—Shielded: 2000; Unshielded: 2000 18 mm—Shielded: 1200; Unshielded: 1200 30 mm—Shielded: 600; Unshielded: 500 Extended range: 12 mm—Shielded: 1200; Unshielded: 500 18 mm—Shielded: 300; Unshielded: 300 30 mm—Shielded: 400; Unshielded: 200
Leakage current	<100 µA
Output voltage drop [Vsat]	<2.5 V
Current consumption	<10 mA
Short-circuit protection	Yes (Auto Reset)
Hysteresis [% of Sr]	2–20%
Repeat accuracy	1% shielded, 3% unshielded
Time delay before availability	<200 ms
Output indicator LED	360° amber LED
Operating temperature range	–40 to 70 °C
Ingress protection	IEC IP67, IP69K, UL Type 1, NEMA Type 6P, NEMA Type 4X
Shock	30 g, 11 ms per IEC 68-2-76
Vibration	10 to 55 Hz, 1 mm amplitude
Housing materials	Front face: Ryton Tube: Stainless steel End bells: M12 body: Polycarbonate Cable end bell: Polycarbonate Nuts: Stainless steel
Cable	AWM style 20387 (PVC)

Recommended Mounting Clearances

For unshielded standard range sensors and extended range sensors, clearance must be provided around the sensor when mounting for reliable performance. (“Sn” is the sensing range of the sensor, “d” is the sensor diameter.)

E57P Performance Sensors, Mounting



Type	Shielding	a	b
Standard range	Shielded	0	0
	Unshielded	Cap height	2 x 5n
Extended range	Shielded	0	0
	Unshielded	Cap height	2 x Sn

Note

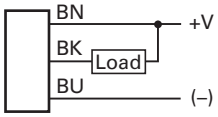
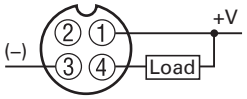
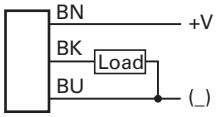
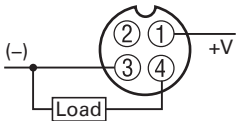
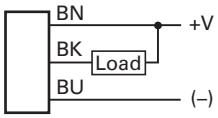
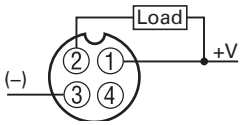
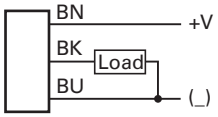
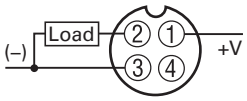
Ryton® is a registered trademark of Phillips Chemical (division of Phillips Petroleum).

① 40–240 Vac at <–4 °F (<–20 °C).

Wiring Diagrams

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

E57P Performance Sensors

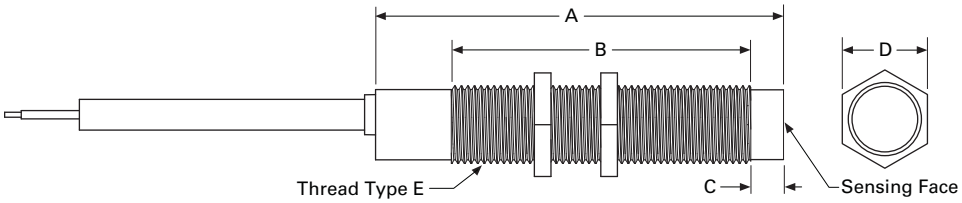
Operating Voltage	Output	Cable Models	Connector Models (Face View Male Shown) Micro
Three-Wire Sensors			
10–48 Vdc	NO (NPN)		
	NO (PNP)		
	NC (NPN)		
	NC (PNP)		

Dimensions

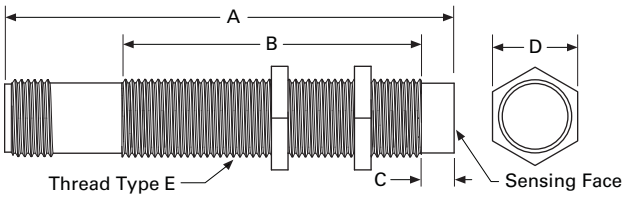
Approximate Dimensions in Inches (mm)

E57P Performance Series Sensors, End Sensing ①

Cable Models



Connector Models



Size	Shielding	Overall Length A	Threaded Length B	Cap Height C	Nut Width D	Thread Size E
Three-Wire DC Sensors—Cable Models						
12 mm	Shielded	2.52 (64.1)	1.98 (50.3)	—	0.67 (16.8)	M12 x 1
	Unshielded	2.52 (64.1)	1.80 (45.8)	0.20 (5.0)	0.67 (16.8)	M12 x 1
18 mm	Shielded	2.59 (65.9)	2.00 (50.9)	—	0.94 (23.8)	M18 x 1
	Unshielded	2.59 (65.9)	1.75 (44.4)	0.28 (7.0)	0.94 (23.8)	M18 x 1
30 mm	Shielded	2.67 (67.7)	1.98 (50.3)	—	1.41 (35.9)	M30 x 1.5
	Unshielded	2.67 (67.7)	1.49 (37.8)	0.51 (13.0)	1.41 (35.9)	M30 x 1.5
Three-Wire DC Sensors—Micro-Connector Models						
12 mm	Shielded	2.70 (68.7)	1.98 (50.3)	—	0.67 (16.8)	M12 x 1
	Unshielded	2.70 (68.7)	1.80 (45.8)	0.20 (5.0)	0.67 (16.8)	M12 x 1
18 mm	Shielded	2.72 (69.2)	2.00 (50.9)	—	0.94 (23.8)	M18 x 1
	Unshielded	2.72 (69.2)	1.75 (44.4)	0.28 (7.0)	0.94 (23.8)	M18 x 1
30 mm	Shielded	2.79 (70.9)	1.98 (50.3)	—	1.41 (35.9)	M30 x 1.5
	Unshielded	2.79 (70.9)	1.49 (37.8)	0.51 (13.0)	1.41 (35.9)	M30 x 1.5

Note

① These dimensions apply to the Performance Series models in this section.

3

E57PS Performance Short Body Sensors

Contents

E57PS Performance Short Body Sensors

Product Description

For demanding sensing applications in areas too small for standard length units, the E57PS Performance Short Body series is an ideal solution as it incorporates the premium features of the E57P series but in a shorter body length. With its stainless steel tubular body, IP69K rating, wide temperature range (down to –40 °C), fast switching speed and laser-etched markings, the E57PS series provides value at a low price point.

Features

- 360° LED indicator
- Stainless steel tube
- 10–48 Vdc operating voltage
- Short-circuit protection
- –40 to 70 °C temperature range
- IP69K environmental rating
- Durable laser-engraved label
- Available in cable and micro-connector styles

Standards and Certifications

- UL Listed, E166051
- UL Tested to Canadian safety standards
- CE
- RoHS Compliant

c UL us LISTED CE RoHS COMPLIANT

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

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

E57PS Performance Short Body Sensors

Three-Wire Sensors

	Operating Voltage	Sensing Range (Sn)	Shielding	Connection Type ①	NO Output Catalog Number	NC Output Catalog Number
12 mm 	**12 mm Diameter**					
	10–48 Vdc	2 mm (standard range)	Shielded (PNP)	2-meter cable	**E57PS-12SPN2-C2**	**E57PS-12SPC2-C2**
				4-pin micro DC connector	**E57PS-12SPN2-Q** ⠿	**E57PS-12SPC2-Q** ⠿
			Shielded (NPN)	2-meter cable	**E57PS-12SNN2-C2**	**E57PS-12SNC2-C2**
				4-pin micro DC connector	**E57PS-12SNN2-Q** ⠿	**E57PS-12SNC2-Q** ⠿
		4 mm (standard range)	Unshielded (PNP)	2-meter cable	**E57PS-12UPN4-C2**	**E57PS-12UPC4-C2**
				4-pin micro DC connector	**E57PS-12UPN4-Q** ⠿	**E57PS-12UPC4-Q** ⠿
			Unshielded (NPN)	2-meter cable	**E57PS-12UNN4-C2**	**E57PS-12UNC4-C2**
				4-pin micro DC connector	**E57PS-12UNN4-Q** ⠿	**E57PS-12UNC4-Q** ⠿
18 mm 	**18 mm Diameter**					
	10–48 Vdc	5 mm (standard range)	Shielded (PNP)	2-meter cable	**E57PS-18SPN5-C2**	**E57PS-18SPC5-C2**
				4-pin micro DC connector	**E57PS-18SPN5-Q** ⠿	**E57PS-18SPC5-Q** ⠿
			Shielded (NPN)	2-meter cable	**E57PS-18SNN5-C2**	**E57PS-18SNC5-C2**
				4-pin micro DC connector	**E57PS-18SNN5-Q** ⠿	**E57PS-18SNC5-Q** ⠿
		8 mm (standard range)	Unshielded (PNP)	2-meter cable	**E57PS-18UPN8-C2**	**E57PS-18UPC8-C2**
				4-pin micro DC connector	**E57PS-18UPN8-Q** ⠿	**E57PS-18UPC8-Q** ⠿
			Unshielded (NPN)	2-meter cable	**E57PS-18UNN8-C2**	**E57PS-18UNC8-C2**
				4-pin micro DC connector	**E57PS-18UNN8-Q** ⠿	**E57PS-18UNC8-Q** ⠿
30 mm 	**30 mm Diameter**					
	10–48 Vdc	10 mm (standard range)	Shielded (PNP)	2-meter cable	**E57PS-30SPN10-C2**	**E57PS-30SPC10-C2**
				4-pin micro DC connector	**E57PS-30SPN10-Q** ⠿	**E57PS-30SPC10-Q** ⠿
			Shielded (NPN)	2-meter cable	**E57PS-30SNN10-C2**	**E57PS-30SNC10-C2**
				4-pin micro DC connector	**E57PS-30SNN10-Q** ⠿	**E57PS-30SNC10-Q** ⠿
		15 mm (standard range)	Unshielded (PNP)	2-meter cable	**E57PS-30UPN15-C2**	**E57PS-30UPC15-C2**
				4-pin micro DC connector	**E57PS-30UPN15-Q** ⠿	**E57PS-30UPC15-Q** ⠿
			Unshielded (NPN)	2-meter cable	**E57PS-30UNN15-C2**	**E57PS-30UNC15-C2**
				4-pin micro DC connector	**E57PS-30UNN15-Q** ⠿	**E57PS-30UNC15-Q** ⠿

Compatible Connector Cables

Standard Cables ②

	Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number
Micro-Style Straight Female 	**Micro-Style, Straight Female**						
	DC	4-pin, 4-wire	22 AWG	6.0 ft (2m)	 1-Brown 2-White 3-Blue 4-Black	**CSDS4A4CY2202**	**CSDS4A4RY2202**

Notes

⠿ See listing of compatible connector cables above.

① 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 E57SAL12T110**S5**.

② For a full selection of connector cables, see **Tab 10**, **section 10.1**.

Accessories

E57PS Performance Short Body Sensors

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

Technical Data and Specifications

E57PS Performance Short Body Sensors

Description	Three-Wire DC Sensors
Operating voltage	10–48 Vdc
Maximum load current	300 mA
Switching frequency [Hz]	12 mm—Shielded: 2000; Unshielded: 2000 18 mm—Shielded: 1200; Unshielded: 1200 30 mm—Shielded: 600; Unshielded: 500
Leakage current	100 µA maximum
Voltage drop	≤2.5 V
Holding current	≤10 mA
Short-circuit protection	Yes (Auto Reset)
Switching hysteresis	2–20% of rated sensing distance
Repeat accuracy	1% shielded, 3% unshielded
Output indicator LED	360° amber LED
Operating temperature	–40 to 158 °F (–40 to 70 °C)
Enclosure ratings	IP67, IP69K; NEMA 4, 4X, 6, 6P
Shock	30 g 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)

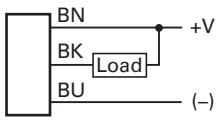
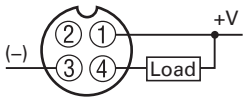
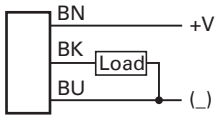
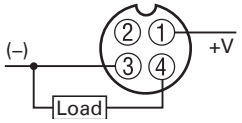
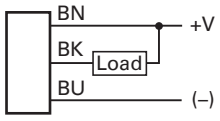
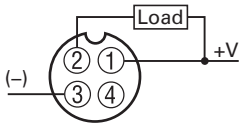
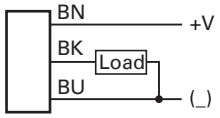
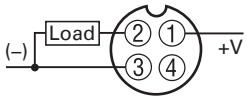
Note

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

Wiring Diagrams

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

E57PS Performance Short Body Sensors

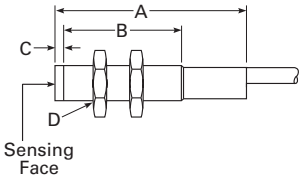
Operating Voltage	Output	Cable Models	Micro-Connector Models (Face View Male Shown)
Three-Wire Sensors			
10–48 Vdc	NO (NPN)		
	NO (PNP)		
	NC (NPN)		
	NC (PNP)		

Dimensions

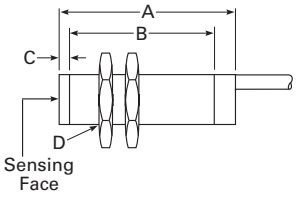
Approximate Dimensions in Inches (mm)

E57PS Performance Short Body Sensors—Cable Models

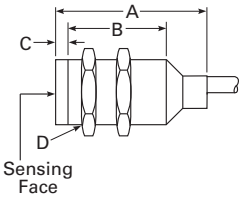
12 mm



18 mm



30 mm

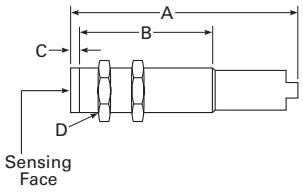


Size	Shielding	Overall Length A	Threaded Length B	Cap Height C	Thread Size D
Three-Wire DC Sensors					
12 mm	Shielded	1.61 (40.9)	1.07 (27.2)	—	M12 x 1
	Unshielded	1.61 (40.9)	0.89 (22.7)	0.20 (5.0)	M12 x 1
18 mm	Shielded	1.77 (44.9)	1.17 (29.8)	—	M18 x 1
	Unshielded	1.77 (44.9)	0.92 (23.3)	0.28 (7.0)	M18 x 1
30 mm	Shielded	1.84 (46.6)	1.15 (29.3)	—	M30 x 1.5
	Unshielded	1.84 (46.6)	0.66 (16.8)	0.51 (13.0)	M30 x 1.5

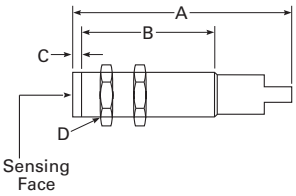
Approximate Dimensions in Inches (mm)

E57PS Performance Short Body Sensors—Micro-Connector Models

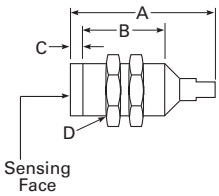
12 mm



18 mm



30 mm



Size	Shielding	Overall Length A	Threaded Length B	Cap Height C	Thread Size D
Three-Wire DC Sensors					
12 mm	Shielded	1.64 (41.5)	1.07 (27.2)	—	M12 x 1
	Unshielded	1.64 (41.5)	0.89 (22.7)	0.20 (5.0)	M12 x 1
18 mm	Shielded	1.59 (40.3)	1.17 (29.8)	—	M18 x 1
	Unshielded	1.59 (40.3)	0.92 (23.3)	0.28 (7.0)	M18 x 1
30 mm	Shielded	1.77 (45.0)	1.15 (29.3)	—	M30 x 1.5
	Unshielded	1.96 (49.7)	0.66 (16.8)	0.51 (13.0)	M30 x 1.5

E57G General Purpose Proximity Sensors

Contents

E57G General Purpose Proximity Sensors

Product Description

For global sensing applications, the E57G General Purpose series is designed for most standard inductive sensing needs. With its stainless steel tubular body, 360 degree visible LED, fast switching speed and laser-etched markings, the E57G series is an ideal cost-effective solution.

Features

- 360° LED indicator
- Stainless steel tube
- 10–30 Vdc operating voltage
- Short-circuit protection
- –25 to 70 °C temperature range
- IP67 environmental rating
- Durable laser-engraved label
- Available in cable and micro-connector styles
- Nickel-brass mounting nuts

Standards and Certifications

- UL Listed, E166051
- UL Tested to Canadian safety standards
- CE
- RoHS Compliant

c UL us LISTED CE RoHS COMPLIANT

⚠ 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

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

E57G General Purpose Proximity Sensors

Three-Wire Sensors

Operating Voltage	Sensing Range	Shielding	Output Type	Connection Type	NO Output Catalog Number	NC Output Catalog Number
12 mm	**12 mm Diameter**					
						
10–30 Vdc	2 mm (standard range)	Shielded	PNP	2-meter cable	**E57G-12SPN2-C2**	**E57G-12SPC2-C2**
				4-pin micro DC connector	**E57G-12SPN2-Q**	**E57G-12SPC2-Q**
			NPN	2-meter cable	**E57G-12SNN2-C2**	**E57G-12SNC2-C2**
				4-pin micro DC connector	**E57G-12SNN2-Q**	**E57G-12SNC2-Q**
	4 mm (standard range)	Unshielded	PNP	2-meter cable	**E57G-12UPN4-C2**	**E57G-12UPC4-C2**
				4-pin micro DC connector	**E57G-12UPN4-Q**	**E57G-12UPC4-Q**
			NPN	2-meter cable	**E57G-12UNN4-C2**	**E57G-12UNC4-C2**
				4-pin micro DC connector	**E57G-12UNN4-Q**	**E57G-12UNC4-Q**
	4 mm (extended range)	Shielded	PNP	2-meter cable	**E57G-12SPN4-C2**	**E57G-12SPC4-C2**
				4-pin micro DC connector	**E57G-12SPN4-Q**	**E57G-12SPC4-Q**
			NPN	2-meter cable	**E57G-12SNN4-C2**	**E57G-12SNC4-C2**
				4-pin micro DC connector	**E57G-12SNN4-Q**	**E57G-12SNC4-Q**
	8 mm (extended range)	Unshielded	PNP	2-meter cable	**E57G-12UPN8-C2**	**E57G-12UPC8-C2**
				4-pin micro DC connector	**E57G-12UPN8-Q**	**E57G-12UPC8-Q**
			NPN	2-meter cable	**E57G-12UNN8-C2**	**E57G-12UNC8-C2**
				4-pin micro DC connector	**E57G-12UNN8-Q**	**E57G-12UNC8-Q**
18 mm	**18 mm Diameter**					
						
10–30 Vdc	5 mm (standard range)	Shielded	PNP	2-meter cable	**E57G-18SPN5-C2**	**E57G-18SPC5-C2**
				4-pin micro DC connector	**E57G-18SPN5-Q**	**E57G-18SPC5-Q**
			NPN	2-meter cable	**E57G-18SNN5-C2**	**E57G-18SNC5-C2**
				4-pin micro DC connector	**E57G-18SNN5-Q**	**E57G-18SNC5-Q**
	8 mm (standard range)	Unshielded	PNP	2-meter cable	**E57G-18UPN8-C2**	**E57G-18UPC8-C2**
				4-pin micro DC connector	**E57G-18UPN8-Q**	**E57G-18UPC8-Q**
			NPN	2-meter cable	**E57G-18UNN8-C2**	**E57G-18UNC8-C2**
				4-pin micro DC connector	**E57G-18UNN8-Q**	**E57G-18UNC8-Q**
	8 mm (extended range)	Shielded	PNP	2-meter cable	**E57G-18SPN8-C2**	**E57G-18SPC8-C2**
				4-pin micro DC connector	**E57G-18SPN8-Q**	**E57G-18SPC8-Q**
			NPN	2-meter cable	**E57G-18SNN8-C2**	**E57G-18SNC8-C2**
				4-pin micro DC connector	**E57G-18SNN8-Q**	**E57G-18SNC8-Q**
	12 mm (extended range)	Unshielded	PNP	2-meter cable	**E57G-18UPN12-C2**	**E57G-18UPC12-C2**
				4-pin micro DC connector	**E57G-18UPN12-Q**	**E57G-18UPC12-Q**
			NPN	2-meter cable	**E57G-18UNN12-C2**	**E57G-18UNC12-C2**
				4-pin micro DC connector	**E57G-18UNN12-Q**	**E57G-18UNC12-Q**

Note

See listing of compatible connector cables on **Page V8-T3-31**.

Three-Wire Sensors, continued

30 mm

Operating Voltage	Sensing Range	Shielding	Output Type	Connection Type	NO Output Catalog Number	NC Output Catalog Number
30 mm Diameter						
10–30 Vdc	10 mm (standard range)	Shielded	PNP	2-meter cable	**E57G-30SPN10-C2**	**E57G-30SPC10-C2**
				4-pin micro DC connector	**E57G-30SPN10-Q**	**E57G-30SPC10-Q**
			NPN	2-meter cable	**E57G-30SNN10-C2**	**E57G-30SNC10-C2**
				4-pin micro DC connector	**E57G-30SNN10-Q**	**E57G-30SNC10-Q**
	15 mm (standard range)	Unshielded	PNP	2-meter cable	**E57G-30UPN15-C2**	**E57G-30UPC15-C2**
				4-pin micro DC connector	**E57G-30UPN15-Q**	**E57G-30UPC15-Q**
			NPN	2-meter cable	**E57G-30UNN15-C2**	**E57G-30UNC15-C2**
				4-pin micro DC connector	**E57G-30UNN15-Q**	**E57G-30UNC15-Q**
	15 mm (extended range)	Shielded	PNP	2-meter cable	**E57G-30SPN15-C2**	**E57G-30SPC15-C2**
				4-pin micro DC connector	**E57G-30SPN15-Q**	**E57G-30SPC15-Q**
			NPN	2-meter cable	**E57G-30SNN15-C2**	**E57G-30SNC15-C2**
				4-pin micro DC connector	**E57G-30SNN15-Q**	**E57G-30SNC15-Q**
	22 mm (extended range)	Unshielded	PNP	2-meter cable	**E57G-30UPN22-C2**	**E57G-30UPC22-C2**
				4-pin micro DC connector	**E57G-30UPN22-Q**	**E57G-30UPC22-Q**
			NPN	2-meter cable	**E57G-30UNN22-C2**	**E57G-30UNC22-C2**
				4-pin micro DC connector	**E57G-30UNN22-Q**	**E57G-30UNC22-Q**

Compatible Connector Cables

Standard Cables ①

Micro-Style Straight Female

Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number
Micro-Style, Straight Female						
DC	4-pin, 3-wire	22 AWG	6.0 ft (2m)	① ② ④ ③ 1-Brown 2-No Wire 3-Blue 4-Black	**CSDS4A3CY2202**	**CSDS4A3RY2202**

Accessories

E57G General Purpose Proximity Sensors

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

Notes

⠿ See listing of compatible connector cables on **Page V8-T3-31**.

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

Technical Data and Specifications

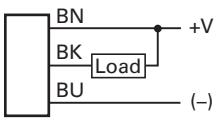
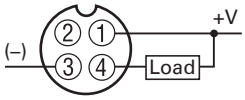
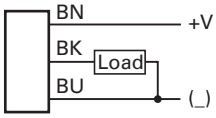
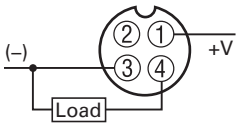
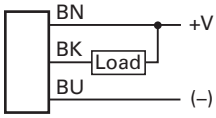
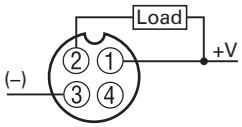
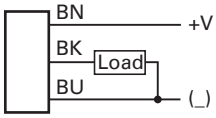
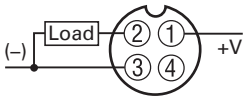
E57G General Purpose Proximity Sensors

Description	Three-Wire DC Sensors
Operating voltage	10–30 Vdc
Output current (continuous)	100 mA
Switching frequency [Hz]	Standard range: 12 mm—Shielded: 2000; Unshielded: 2000 18 mm—Shielded: 1200; Unshielded: 1200 30 mm—Shielded: 600; Unshielded: 500 Extended range: 12 mm—Shielded: 1200; Unshielded: 500 18 mm—Shielded: 300; Unshielded: 300 30 mm—Shielded: 400; Unshielded: 200
Leakage current	<100 µA
Output voltage drop [Vsat]	<2.5 V
Current consumption	<10 mA
Short-circuit protection	Yes (Auto Reset)
Hysteresis [% of Sr]	2–20%
Repeat accuracy	1% shielded, 3% unshielded
Time delay before availability	<200 ms
Output indicator LED	360° amber LED
Operating temperature range	–25 to 70 °C
Ingress protection	IEC IP67, UL Type 1
Mechanical shock	IEC 60947-5-2 30 G half-sine wave, 11 mS
Vibration	IEC 60947-5-2 10–55 Hz, 1 mm amplitude
Housing materials	Front face: Ryton Tube: stainless steel End bells: M12 body: Polycarbonate Cable end bell: Polycarbonate Nuts: Ni-Brass
Cable	AWM style 20387 (PVC)

Wiring Diagrams

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

E57G General Purpose Proximity Sensors

Operating Voltage	Output	Cable Models	Connector Models (Face View Male Shown) Micro
Three-Wire Sensors			
10–30 Vdc	NO (NPN)		
	NO (PNP)		
	NC (NPN)		
	NC (PNP)		

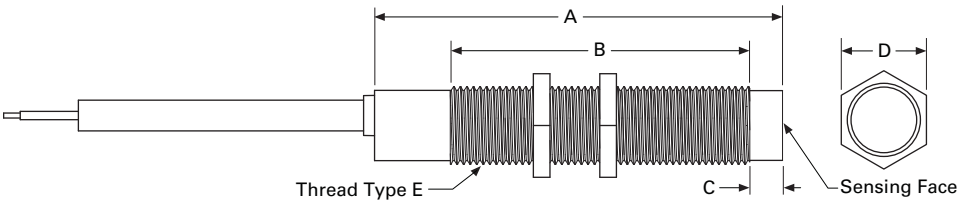
Dimensions

Approximate Dimensions in Inches (mm)

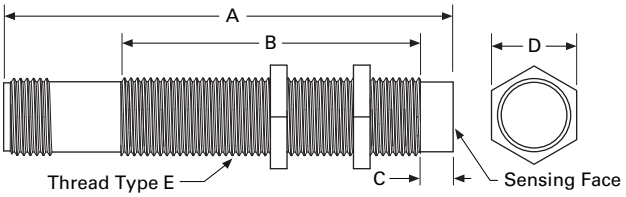
E57G General Purpose Proximity Sensors

3

Cable Models



Connector Models



Size	Shielding	Overall Length A	Threaded Length B	Cap Height C	Nut Width D	Thread Size E
Three-Wire DC Sensors—Cable Models						
12 mm	Shielded	2.52 (64.1)	1.98 (50.3)	—	0.67 (16.8)	M12 x 1
	Unshielded	2.52 (64.1)	1.80 (45.8)	0.20 (5.0)	0.67 (16.8)	M12 x 1
18 mm	Shielded	2.59 (65.9)	2.00 (50.9)	—	0.94 (23.8)	M18 x 1
	Unshielded	2.59 (65.9)	1.75 (44.4)	0.28 (7.0)	0.94 (23.8)	M18 x 1
30 mm	Shielded	2.67 (67.7)	1.98 (50.3)	—	1.41 (35.9)	M30 x 1.5
	Unshielded	2.67 (67.7)	1.49 (37.8)	0.51 (13.0)	1.41 (35.9)	M30 x 1.5
Three-Wire DC Sensors—Micro-Connector Models						
12 mm	Shielded	2.70 (68.7)	1.98 (50.3)	—	0.67 (16.8)	M12 x 1
	Unshielded	2.70 (68.7)	1.80 (45.8)	0.20 (5.0)	0.67 (16.8)	M12 x 1
18 mm	Shielded	2.72 (69.2)	2.00 (50.9)	—	0.94 (23.8)	M18 x 1
	Unshielded	2.72 (69.2)	1.75 (44.4)	0.28 (7.0)	0.94 (23.8)	M18 x 1
30 mm	Shielded	2.79 (70.9)	1.98 (50.3)	—	1.41 (35.9)	M30 x 1.5
	Unshielded	2.79 (70.9)	1.49 (37.8)	0.51 (13.0)	1.41 (35.9)	M30 x 1.5

E57 Two-Wire (AC, AC/DC, DC) Proximity Sensors

Contents

3

E57 Two-Wire (AC, AC/DC, DC) Proximity Sensors

Product Description

Eaton carries several options for your sensing needs in the E57 two-wire family. The stainless steel models are available in a standard length or short body, while available in AC or AC/DC configurations. The nickel-brass body models are available in standard length and either AC or DC two-wire configurations.

All of these are available in NPN or PNP with cable connections or micro connectors. The stainless steel standard length models are also available with mini connectors.

The stainless steel models in both lengths have 360 degree LEDs while the nickel-brass models have a single LED indicator.

Extended sensing ranges are also available in the stainless steel and nickel-brass standard length models, while shielded and unshielded models are offered throughout the E57 two-wire sensor products.

Standards and Certifications

- Stainless Steel:
  - UL Listed, E166051
  - UL Tested to Canadian safety standards
  - CE (AC/DC only)
  - RoHS Compliant
- Nickel-Brass:
  - CSA Certified, 224447
  - Products certified by CSA for US
  - CE (DC only)
  - RoHS Compliant

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.

Highlighted Comparisons

Description	Stainless Steel	Stainless Steel Short Body	Nickel-Brass
Current ratings	250–500 mA	250–500 mA	200 mA
Enclosure ratings	NEMA 4, 4K, 6, 6P, 12, 13, IEC IP6, IP69K7	NEMA 4, 4K, 6, 6P, 12, 13, IEC IP67	IP67, IP69K
Operating temperature	–25 to 70 °C	–25 to 70 °C	–25 to 70 °C
Indicator	360° LED	360° LED	LED
Increased shock and vibration ratings	Yes	Yes	No

For the most current information on this product, visit our Web site: 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.

Product Selection

Stainless Steel Body (Standard Length)

Two-Wire Sensors

Operating Voltage	Sensing Range (Sn)	Shielding	Connection Type ①	NO Output Catalog Number	NC Output Catalog Number
12 mm 	**12 mm Diameter End Sensing**				
20–250 Vac	2 mm (standard range)	Shielded	2-meter cable	**E57LAL12A2**	**E57LBL12A2**
			3-pin micro AC connector	**E57LAL12A2SA**	**E57LBL12A2SA**
			3-pin micro AC pigtail connector	**E57LAL12A2SP**	**E57LBL12A2SP**
	4 mm (standard range)	Unshielded	2-meter cable	**E57LAL12A2E**	**E57LBL12A2E**
			3-pin micro AC connector	**E57LAL12A2EA**	**E57LBL12A2EA**
			3-pin micro AC pigtail connector	**E57LAL12A2EP**	**E57LBL12A2EP**
20–132 Vac	6 mm (extended range)	Semi-shielded	2-meter cable	**E57-12LE06-A**	**E57-12LE06-A1**
			3-pin micro AC connector	**E57-12LE06-AA**	**E57-12LE06-A1A**
			3-pin micro AC pigtail connector	**E57-12LE06-AP**	—
	10 mm (extended range)	Non-embeddable	2-meter cable	**E57-12LE10-A**	**E57-12LE10-A1**
			3-pin micro AC connector	**E57-12LE10-AA**	**E57-12LE10-A1A**
			3-pin micro AC pigtail connector	**E57-12LE10-AP**	**E57-12LE10-A1P**
40–250 Vac 50/60 Hz② 20–250 Vdc	2 mm (standard range)	Shielded	2-meter cable	**E57SAL12A2**	**E57SBL12A2**
			3-pin micro AC connector	**E57SAL12A2SA**	**E57SBL12A2SA**
			3-pin mini-connector	**E57MAL12A2B1**	—
	4 mm (standard range)	Unshielded	2-meter cable	**E57SAL12A2E**	**E57SBL12A2E**
			3-pin micro AC connector	**E57SAL12A2EA**	**E57SBL12A2EA**
18 mm 	**18 mm Diameter End Sensing**				
20–250 Vac	5 mm (standard range)	Shielded	2-meter cable	**E57LAL18A2**	**E57LBL18A2**
			3-pin micro AC connector	**E57LAL18A2SA**	**E57LBL18A2SA**
			3-pin micro AC pigtail connector	**E57LAL18A2SP**	**E57LBL18A2SP**
			3-pin mini-connector	**E57MAL18A2B1**	**E57MBL18A2B1**
	8 mm (standard range)	Unshielded	2-meter cable	**E57LAL18A2E**	**E57LBL18A2E**
			3-pin micro AC connector	**E57LAL18A2EA**	**E57LBL18A2EA**
			3-pin micro AC pigtail connector	**E57LAL18A2EP**	**E57LBL18A2EP**
			3-pin mini-connector	**E57MAL18A2EB1**	**E57MBL18A2EB1**
20–132 Vac	12 mm (extended range)	Semi-shielded	2-meter cable	**E57-18LE12-A**	**E57-18LE12-A1**
			3-pin micro AC connector	**E57-18LE12-AA**	**E57-18LE12-A1A**
			3-pin micro AC pigtail connector	**E57-18LE12-AP**	**E57-18LE12-A1P**
			3-pin mini-connector	**E57-18LE12-AB**	**E57-18LE12-A1B**
	18 mm (extended range)	Non-embeddable	2-meter cable	**E57-18LE20-A**	**E57-18LE20-A1**
			3-pin micro AC connector	**E57-18LE20-AA**	**E57-18LE20-A1A**
			3-pin micro AC pigtail connector	**E57-18LE20-AP**	**E57-18LE20-A1P**
			3-pin mini-connector	**E57-18LE20-AB**	**E57-18LE20-A1B**
40–250 Vac 50/60 Hz② 20–250 Vdc	5 mm (standard range)	Shielded	2-meter cable	**E57SAL18A2**	**E57SBL18A2**
			3-pin micro AC connector	**E57SAL18A2SA**	**E57SBL18A2SA**
	8 mm (standard range)	Unshielded	2-meter cable	**E57SAL18A2E**	**E57SBL18A2E**
			3-pin micro AC connector	**E57SAL18A2EA**	**E57SBL18A2EA**

Notes

See listing of compatible connector cables on **Page V8-T3-40**.

① For cable lengths longer than 2 meters, add the number of the desired length in meters to the end of the listed catalog number (for catalog numbers ending with a number, add an **S** and then the length). Examples for a 5-meter cable: E57-18LE12-A becomes E57-18LE12-A**5**; E57LAL12A2 becomes E57LAL12A2**S5**.

② Avoid wiring these AC/DC models in series as the sensors may not perform reliably. Contact Eaton's Applications Engineering at 1-800-426-9184 with questions.

Stainless Steel Body (Standard Length)

Two-Wire Sensors, continued

Operating Voltage	Sensing Range (Sn)	Shielding	Connection Type ①	NO Output Catalog Number	NC Output Catalog Number
Right Angle	**18 mm Diameter Right Angle Sensing**				
					
20–250 Vac	5 mm	Shielded	2-meter cable	**E57RAL18A2**	**E57RBL18A2**
			3-pin micro AC connector	**E57RAL18A2SA**	**E57RBL18A2SA**
			3-pin micro AC pigtail connector	**E57RAL18A2SP**	**E57RBL18A2SP**
			3-pin mini-connector	**E57RAL18A2B1**	**E57RBL18A2B1**
	8 mm	Unshielded	2-meter cable	**E57RAL18A2E**	**E57RBL18A2E**
			3-pin micro AC connector	**E57RAL18A2EA**	**E57RBL18A2EA**
			3-pin micro AC pigtail connector	**E57RAL18A2EP**	**E57RBL18A2EP**
			3-pin mini-connector	**E57RAL18A2EB1**	**E57RBL18A2EB1**
30 mm	**30 mm Diameter End Sensing**				
					
20–250 Vac	10 mm (standard range)	Shielded	2-meter cable	**E57LAL30A2**	**E57LBL30A2**
			3-pin micro AC connector	**E57LAL30A2SA**	**E57LBL30A2SA**
			3-pin micro AC pigtail connector	**E57LAL30A2SP**	**E57LBL30A2SP**
			3-pin mini-connector	**E57MAL30A2B1**	**E57MBL30A2B1**
	15 mm (standard range)	Unshielded	2-meter cable	**E57LAL30A2E**	**E57LBL30A2E**
			3-pin micro AC connector	**E57LAL30A2EA**	**E57LBL30A2EA**
			3-pin micro AC pigtail connector	**E57LAL30A2EP**	**E57LBL30A2EP**
			3-pin mini-connector	**E57MAL30A2EB1**	**E57MBL30A2EB1**
20–132 Vac	22 mm (extended range)	Semi-shielded	2-meter cable	**E57-30LE22-A**	**E57-30LE22-A1**
			3-pin micro AC connector	**E57-30LE22-AA**	**E57-30LE22-A1A**
			3-pin micro AC pigtail connector	**E57-30LE22-AP**	**E57-30LE22-A1P**
			3-pin mini-connector	**E57-30LE22-AB**	**E57-30LE22-A1B**
40–250 Vac 50/60 Hz② 20–250 Vdc	10 mm (standard range)	Shielded	2-meter cable	**E57SAL30A2**	**E57SBL30A2**
			3-pin micro AC connector	**E57SAL30A2SA**	**E57SBL30A2SA**
	15 mm (standard range)	Unshielded	2-meter cable	**E57SAL30A2E**	**E57SBL30A2E**
			3-pin micro AC connector	**E57SAL30A2EA**	**E57SBL30A2EA**

Notes

See listing of compatible connector cables on **Page V8-T3-40**.

① For cable lengths longer than 2 meters, add the number of the desired length in meters to the end of the listed catalog number (for catalog numbers ending with a number, add an **S** and then the length). Examples for a 5-meter cable: E57-18LE12-A becomes E57-18LE12-A**5**; E57LAL12A2 becomes E57LAL12A2**S5**.

② Avoid wiring these AC/DC models in series as the sensors may not perform reliably. Contact Eaton's Applications Engineering at 1-800-426-9184 with questions.

Stainless Steel Short Body

Two-Wire Sensors

Operating Voltage	Sensing Range (Sn)	Shielding	Connection Type ①	NO Output Catalog Number	NC Output Catalog Number
12 mm					
					
12 mm Diameter					
20–250 Vac	2 mm	Shielded	2-meter cable	**E57SAL12A4**	**E57SBL12A4**
			3-pin micro AC connector	**E57SAL12A4SA** ⓐ	**E57SBL12A4SA** ⓐ
	4 mm	Unshielded	2-meter cable	**E57SAL12A4E**	**E57SBL12A4E**
			3-pin micro AC connector	**E57SAL12A4EA** ⓐ	**E57SBL12A4EA** ⓐ
40–250 Vac 50/60 Hz② 20–250 Vdc	2 mm	Shielded	2-meter cable	**E57SAL12A2**	**E57SBL12A2**
			3-pin micro AC connector	**E57SAL12A2SA** ⓐ	**E57SBL12A2SA** ⓐ
	4 mm	Unshielded	2-meter cable	**E57SAL12A2E**	**E57SBL12A2E**
			3-pin micro AC connector	**E57SAL12A2EA** ⓐ	**E57SBL12A2EA** ⓐ
18 mm					
					
18 mm Diameter					
20–250 Vac	5 mm	Shielded	2-meter cable	**E57SAL18A4**	**E57SBL18A4**
			3-pin micro AC connector	**E57SAL18A4SA** ⓐ	**E57SBL18A4SA** ⓐ
	8 mm	Unshielded	2-meter cable	**E57SAL18A4E**	**E57SBL18A4E**
			3-pin micro AC connector	**E57SAL18A4EA** ⓐ	**E57SBL18A4EA** ⓐ
40–250 Vac 50/60 Hz② 20–250 Vdc	5 mm	Shielded	2-meter cable	**E57SAL18A2**	**E57SBL18A2**
			3-pin micro AC connector	**E57SAL18A2SA** ⓐ	**E57SBL18A2SA** ⓐ
	8 mm	Unshielded	2-meter cable	**E57SAL18A2E**	**E57SBL18A2E**
			3-pin micro AC connector	**E57SAL18A2EA** ⓐ	**E57SBL18A2EA** ⓐ
30 mm					
					
30 mm Diameter					
20–250 Vac	10 mm	Shielded	2-meter cable	**E57SAL30A4**	**E57SBL30A4**
			3-pin micro AC connector	**E57SAL30A4SA** ⓐ	**E57SBL30A4SA** ⓐ
	15 mm	Unshielded	2-meter cable	**E57SAL30A4E**	**E57SBL30A4E**
			3-pin micro AC connector	**E57SAL30A4EA** ⓐ	**E57SBL30A4EA** ⓐ
40–250 Vac 50/60 Hz② 20–250 Vdc	10 mm	Shielded	2-meter cable	**E57SAL30A2**	**E57SBL30A2**
			3-pin micro AC connector	**E57SAL30A2SA** ⓐ	**E57SBL30A2SA** ⓐ
	15 mm	Unshielded	2-meter cable	**E57SAL30A2E**	**E57SBL30A2E**
			3-pin micro AC connector	**E57SAL30A2EA** ⓐ	**E57SBL30A2EA** ⓐ

Notes

ⓐ See listing of compatible connector cables on **Page V8-T3-40**.

① 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 E57SAL12T110**S5**.

② Avoid wiring these AC/DC models in series as the sensors may not perform reliably. Contact Eaton's Applications Engineering at 1-800-426-9184 with questions.

Nickel-Brass Body

Two-Wire Sensors

	Operating Voltage	Sensing Range	Shielding	Output Type	Connection Type	NO Output Catalog Number	NC Output Catalog Number
12 mm 	**12 mm Diameter**						
	20–250 Vac	2 mm	Shielded	—	2-meter cable	**E57-12GS02-A**	**E57-12GS02-A1**
					3-pin micro AC connector	**E57-12GS02-AAB** (1)	**E57-12GS02-A1AB** (1)
		4 mm	Unshielded	—	2-meter cable	**E57-12GU04-A**	**E57-12GU04-A1**
					3-pin micro AC connector	**E57-12GU04-AAB** (1)	**E57-12GU04-A1AB** (1)
	10–30 Vdc	2 mm	Shielded	NPN/PNP	2-meter cable	**E57-12GS02-D**	**E57-12GS02-D1**
					4-pin micro DC connector	**E57-12GS02-DDB** (2)	**E57-12GS02-D1DB** (2)
		4 mm	Unshielded	NPN/PNP	2-meter cable	**E57-12GU04-D**	**E57-12GU04-D1**
					4-pin micro DC connector	**E57-12GU04-DDB** (2)	**E57-12GU04-D1DB** (2)
		8 mm (extended range)		NPN/PNP	2-meter cable	**E57-12GE08-D**	**E57-12GE08-D1**
					4-pin micro DC connector	**E57-12GE08-DDB** (2)	**E57-12GE08-D1DB** (2)
18 mm 	**18 mm Diameter**						
	20–250 Vac	5 mm	Shielded	—	2-meter cable	**E57-18GS05-A**	**E57-18GS05-A1**
					3-pin micro AC connector	**E57-18GS05-AAB** (1)	**E57-18GS05-A1AB** (1)
		8 mm	Unshielded	—	2-meter cable	**E57-18GU08-A**	**E57-18GU08-A1**
					3-pin micro AC connector	**E57-18GU08-AAB** (1)	**E57-18GU08-A1AB** (1)
		16 mm			3-pin micro AC connector	**E57-18GE16-AAB** (1)	**E57-18GE16-A1AB** (1)
	10–30 Vdc	5 mm	Shielded	NPN/PNP	2-meter cable	**E57-18GS05-D**	**E57-18GS05-D1**
					4-pin micro DC connector	**E57-18GS05-DDB** (2)	**E57-18GS05-D1DB** (2)
		8 mm	Unshielded	NPN/PNP	2-meter cable	**E57-18GU08-D**	**E57-18GU08-D1**
					4-pin micro DC connector	**E57-18GU08-DDB** (2)	**E57-18GU08-D1DB** (2)
		16 mm (extended range)		NPN/PNP	2-meter cable	**E57-18GE16-D**	**E57-18GE16-D1**
					4-pin micro DC connector	**E57-18GE16-DDB** (2)	**E57-18GE16-D1DB** (2)
30 mm 	**30 mm Diameter**						
	20–250 Vac	10 mm	Shielded	—	2-meter cable	**E57-30GS10-A**	**E57-30GS10-A1**
					3-pin micro AC connector	**E57-30GS10-AAB** (1)	**E57-30GS10-A1AB** (1)
		15 mm	Unshielded	—	2-meter cable	**E57-30GU15-A**	**E57-30GU15-A1**
					3-pin micro AC connector	**E57-30GU15-AAB** (1)	**E57-30GU15-A1AB** (1)
	10–30 Vdc	10 mm	Shielded	NPN/PNP	2-meter cable	**E57-30GS10-D**	**E57-30GS10-D1**
					4-pin micro DC connector	**E57-30GS10-DDB** (2)	**E57-30GS10-D1DB** (2)
		15 mm	Unshielded	NPN/PNP	2-meter cable	**E57-30GU15-D**	**E57-30GU15-D1**
					4-pin micro DC connector	**E57-30GU15-DDB** (2)	**E57-30GU15-D1DB** (2)
		25 mm (extended range)		NPN/PNP	2-meter cable	**E57-30GE25-D**	**E57-30GE25-D1**
					4-pin micro DC connector	**E57-30GE25-DDB** (2)	**E57-30GE25-D1DB** (2)

Note

(1) (2) See listing of compatible connector cables on **Page V8-T3-40**.

Compatible Connector Cables

Standard Cables ①

Micro-Style Straight Female

Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number
Micro-Style, Straight Female						
AC	3-pin, 3-wire	22 AWG	6.0 ft (2m)	② ③ ① 1-Green 2-Red/Black 3-Red/White	**CSAS3F3CY2202**	**CSAS3F3RY2202**

Accessories

E57 Two-Wire Proximity Sensors

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

Note

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

Technical Data and Specifications

Stainless Steel Body

Description	Two-Wire AC Sensors	Two-Wire AC/DC Sensors	
		AC Operation	DC Operation
Operating voltage	40–250 Vac	40–250 Vac	20–250 Vdc
Maximum load current	250 mA	200 mA	200 mA
Switching frequency	20 Hz	60 Hz	60 Hz
Leakage current	1.7 mA maximum at 70 °C	1.7V mA maximum at 120 Vac	≤2.0 mA
Voltage drop	7V maximum	≤4 V at >25 mA	12 V at <10 mA
Holding current	5 mA minimum	5 mA minimum	5 mA maximum
Protection	—	Resettable short circuit; overload protection	Resettable short circuit; overload protection
Switching hysteresis	2–20% of rated sensing distance	2–20% of rated sensing distance	2–20% of rated sensing distance
Repeat accuracy	<3% sensing distance	<3% sensing distance	<3% sensing distance
Output indicator LED	360° viewable LED	360° viewable LED	360° viewable LED
Operating temperature	–13 to 158 °F (–25 to 70 °C) ①	–13 to 158 °F (–25 to 70 °C) ①	–13 to 158 °F (–25 to 70 °C) ①
Enclosure ratings	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67)	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67)	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67)
Shock	30 g sine wave, 11 ms per IEC68-2-76	30 g sine wave, 11 ms per IEC68-2-76	30 g sine wave, 11 ms per IEC68-2-76
Vibration	10 to 55 Hz, 1 mm amplitude	10 to 55 Hz, 1 mm amplitude	10 to 55 Hz, 1 mm amplitude
Material of construction	Stainless steel, polycarbonate end bells, Ryton® front cap	Stainless steel, polycarbonate end bells, Ryton® front cap	Stainless steel, polycarbonate end bells, Ryton® front cap
Cable	AWM Style 20387 (PVC)	AWM Style 20387 (PVC)	AWM Style 20387 (PVC)

Notes

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

① 240 Vac operation is limited to less than 122 °F (50 °C) in two-wire AC/DC models.

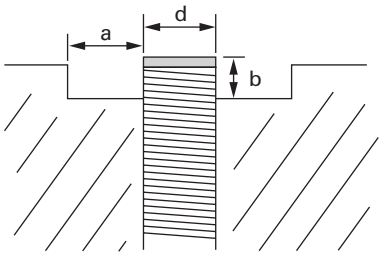
Nickel-Brass Body

Description	Two-Wire AC Sensors	Two-Wire DC Sensors
Operating voltage	20–250 Vac	10–30 Vdc
OFF-state leakage	<1.8 mA	<0.8 mA
Maximum load current	200 mA	100 mA
Minimum load current	5 mA	3 mA
Surge current	5 A (20 ms)	—
Voltage drop	<8 Vac at 400 mA	<6 V
Switching frequency		
8 mm diameter	—	—
12 mm diameter	25 Hz	1 kHz (shielded); 1 kHz (unshielded)
18 mm diameter	25 Hz	1 kHz (shielded); 500 Hz (unshielded)
30 mm diameter	25 Hz	500 Hz (shielded); 200 Hz (unshielded)
Short-circuit protection	No	Yes
Overload trip point	—	>120 mA
Time delay before availability	—	—
Transient protection	—	2 kV, 1 ms, 1 kohm
Repeat accuracy	Shielded: <1.0%/Unshielded: <3.0% (Sr)	<2.0% (Sr)
Switching hysteresis	<15%	<15%
Operating temperature	–13 to 158 °F (–25 to 70 °C) (32 to 140 °F [0 to 60 °C] for all extended range models)	–13 to 158 °F (–25 to 70 °C) (32 to 140 °F [0 to 60 °C] for all extended range models)
Temperature drift	<10% (Sr)	<10% (Sr)
Protection	IP67, IP69K	IP67, IP69K
Housing material	Nickel plated brass (stainless steel for 8 mm diameter, nano-connector models)	Nickel plated brass (stainless steel for 8 mm diameter, nano-connector models)
Cable	PVC jacket, 2-meter length	PVC jacket, 2-meter length

Recommended Mounting Clearances

For unshielded standard range sensors and extended range sensors, clearance must be provided around the sensor when mounting for reliable performance. ("Sn" is the sensing range of the sensor, "d" is the sensor diameter.)

E57 Premium Sensors, Mounting

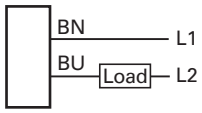
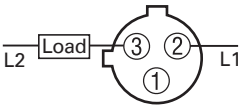
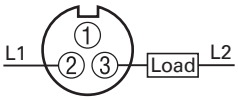
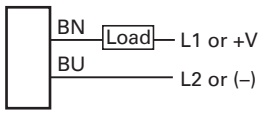
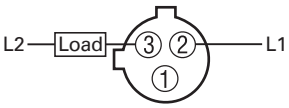
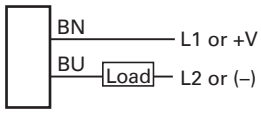
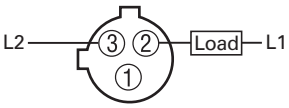


Type	Shielding	a	b
Standard range	Shielded	0	0
	Unshielded	Cap height	2 x 5n
Extended range	Semi-shielded	d	Sn
	Non-embeddable	Cap height	2 x Sn

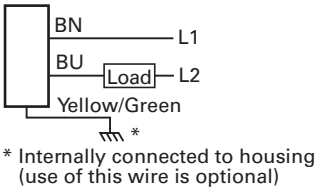
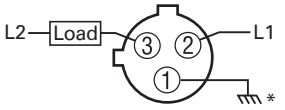
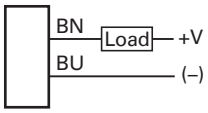
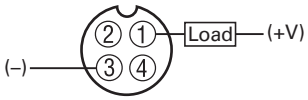
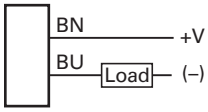
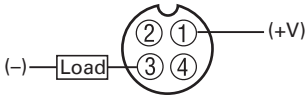
Wiring Diagrams

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

Stainless Steel Body

Operating Voltage	Output	Cable Models	Connector Models (Face View Male Shown) Micro	Mini
Two-Wire Sensors				
20–250 Vac/dc and AC-only AC wiring example	NO and NC			
20–250 Vac/dc DC wiring example	NO and NC (NPN)			—
	NO and NC (PNP)			—

Nickel-Brass Body

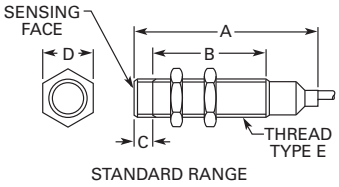
Operating Voltage	Output	Cable Models	Connector Models (Face View Male Shown) Micro
Two-Wire Sensors			
20–250 Vac	NO	 * Internally connected to housing (use of this wire is optional)	 * Internally connected to housing (use of this wire is optional)
10–30 Vdc	NO (NPN)		
	NO (PNP)		

Dimensions

Approximate Dimensions in Inches (mm)

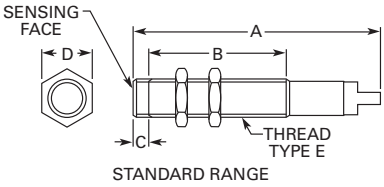
Stainless Steel Body (Standard Length)

Cable Models



STANDARD RANGE

Connector Models



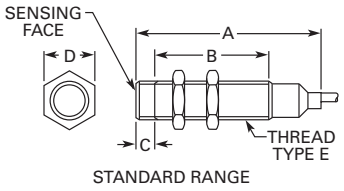
STANDARD RANGE

Size	Shielding	Overall Length A	Threaded Length B	Cap Height C	Nut Width D	Thread Size E
Two-Wire AC Sensors—Cable Models						
12 mm	Shielded	2.46 (62.4)	1.98 (50.3)	—	0.67 (16.8)	M12 x 1
	Semi-shielded	2.87 (72.8)	2.28 (57.9)	0.06 (1.62)	0.67 (16.8)	M12 x 1
	Unshielded	2.87 (72.7)	1.98 (50.3)	0.36 (9.14)	0.67 (16.8)	M12 x 1
18 mm	Shielded	2.54 (64.5)	2.00 (50.9)	—	0.94 (23.8)	M18 x 1
	Semi-shielded	2.60 (66.1)	1.90 (48.2)	0.10 (2.54)	0.94 (23.8)	M18 x 1
	Unshielded	2.60 (66.0)	1.47 (37.2)	0.56 (14.1)	0.94 (23.8)	M18 x 1
30 mm	Shielded	2.73 (69.3)	1.98 (50.3)	—	1.41 (35.9)	M30 x 1.5
	Semi-shielded	2.67 (67.8)	1.90 (48.2)	0.13 (3.30)	1.41 (35.9)	M30 x 1.5
	Unshielded	2.73 (69.3)	1.49 (37.8)	0.52 (13.26)	1.41 (35.9)	M30 x 1.5
Two-Wire AC Sensors—Micro-Connector Models						
12 mm	Shielded	2.69 (68.4)	1.98 (50.3)	—	0.67 (16.8)	M12 x 1
	Semi-shielded	3.04 (77.2)	2.28 (57.9)	0.06 (1.62)	0.67 (16.8)	M12 x 1
	Unshielded	3.06 (77.7)	1.98 (50.3)	0.36 (9.14)	0.36 (9.14)	M12 x 1
18 mm	Shielded	2.72 (69.06)	2.00 (50.9)	—	0.94 (23.8)	M18 x 1
	Semi-shielded	2.72 (69.1)	1.90 (48.2)	0.10 (2.54)	0.94 (23.8)	M18 x 1
	Unshielded	2.74 (69.4)	1.47 (37.2)	0.56 (14.1)	0.94 (23.8)	M18 x 1
30 mm	Shielded	2.91 (73.8)	1.98 (50.3)	—	1.41 (35.9)	M30 x 1.5
	Semi-shielded	2.78 (70.6)	1.90 (48.2)	0.13 (3.30)	1.41 (35.9)	M30 x 1.5
	Unshielded	2.91 (73.8)	1.49 (37.8)	0.52 (13.26)	1.41 (35.9)	M30 x 1.5

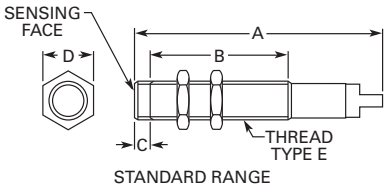
Approximate Dimensions in Inches (mm)

Stainless Steel Body (Standard Length)

Cable Models, continued



Connector Models, continued

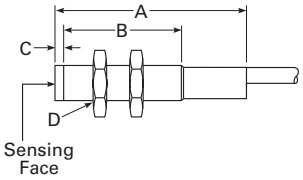


Size	Shielding	Overall Length A	Threaded Length B	Cap Height C	Nut Width D	Thread Size E
Two-Wire AC/DC Sensors—Cable Models						
12 mm	Shielded	2.45 (62.4)	1.98 (50.3)	—	0.67 (16.8)	M12 x 1
	Unshielded	2.45 (62.4)	1.80 (45.8)	0.20 (5)	0.67 (16.8)	M12 x 1
18 mm	Shielded	2.54 (64.5)	2.00 (50.9)	—	0.94 (23.8)	M18 x 1
	Unshielded	2.54 (64.5)	1.75 (44.4)	0.28 (7)	0.94 (23.8)	M18 x 1
30 mm	Shielded	2.72 (69.3)	2.12 (53.8)	—	1.41 (35.9)	M30 x 1.5
	Unshielded	2.72 (69.3)	1.63 (41.4)	0.52 (13.26)	1.41 (35.9)	M30 x 1.5
Two-Wire AC/DC Sensors—Micro-Connector Models						
12 mm	Shielded	2.69 (68.4)	1.98 (50.3)	—	0.67 (16.8)	M12 x 1
	Unshielded	2.69 (68.4)	1.80 (45.8)	0.20 (5)	0.67 (16.8)	M12 x 1
18 mm	Shielded	2.72 (69.06)	2.00 (50.9)	—	0.94 (23.8)	M18 x 1
	Unshielded	2.72 (69.06)	1.75 (44.4)	0.28 (7)	0.94 (23.8)	M18 x 1
30 mm	Shielded	2.91 (73.8)	1.98 (50.3)	—	1.41 (35.9)	M30 x 1.5
	Unshielded	2.91 (73.8)	1.49 (37.8)	0.52 (13.26)	1.41 (35.9)	M30 x 1.5
Two-Wire AC Sensors—Mini-Connector Models						
18 mm	Shielded	3.39 (86.1)	2.00 (50.8)	0.02 (0.5)	0.94 (23.8)	M18 x 1
	Semi-shielded	3.39 (86.0)	1.90 (48.2)	0.10 (2.54)	0.94 (23.8)	M18 x 1
	Unshielded	3.39 (86.1)	1.46 (37.0)	0.57 (14.5)	0.94 (23.8)	M18 x 1
30 mm	Shielded	3.39 (86.1)	2.1 (53.3)	0.03 (0.8)	1.41 (35.9)	M30 x 1.5
	Semi-shielded	3.44 (87.4)	1.90 (48.2)	0.13 (3.30)	1.41 (35.9)	M30 x 1.5
	Unshielded	3.39 (86.1)	1.55 (39.4)	0.55 (14.0)	1.41 (35.9)	M30 x 1.5

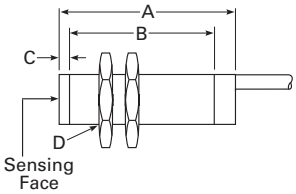
Approximate Dimensions in Inches (mm)

Stainless Steel Short Body (Cable Connector Models)

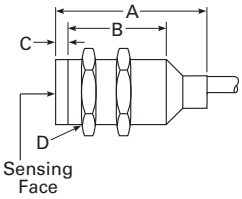
12 mm



18 mm



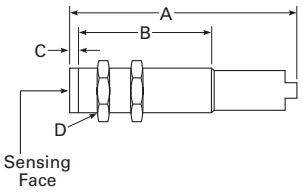
30 mm



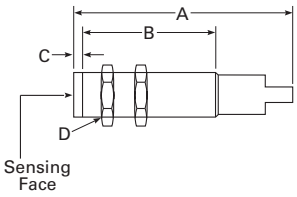
Size	Shielding	Overall Length A	Threaded Length B	Cap Height C	Thread Size D
Two-Wire AC Sensors					
12 mm	Shielded	2.04 (51.7)	1.56 (39.6)	0.02 (0.5)	M12 x 1
	Unshielded	2.04 (51.7)	1.38 (35.1)	0.20 (5)	M12 x 1
18 mm	Shielded	1.39 (35.3)	0.86 (21.82)	0.02 (0.5)	M18 x 1
	Unshielded	1.39 (35.3)	0.60 (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
Two-Wire AC/DC Sensors					
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

Stainless Steel Short Body (Micro-Connector Models)

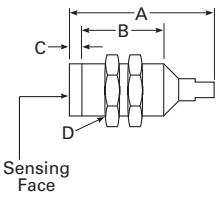
12 mm



18 mm



30 mm



Size	Shielding	Overall Length A	Threaded Length B	Cap Height C	Thread Size D
Two-Wire AC Sensors					
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
Two-Wire AC/DC Sensors					
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

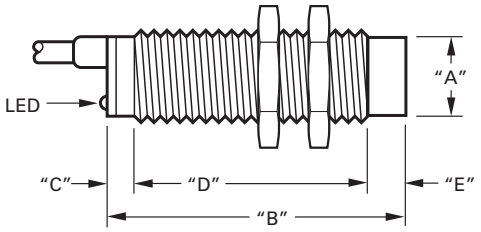
Approximate Dimensions in mm

Nickel-Brass Body

Cable Models

3

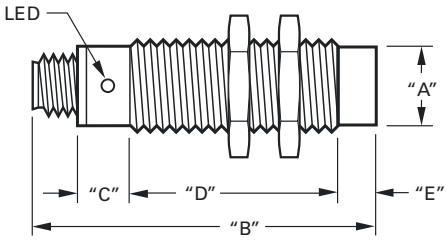
Two-Wire Sensors



Catalog Number	Operating Voltage	A	B	C	D	E
E57-12GS02-A	20–250 Vac	M12x1	65	15	50	—
E57-12GU04-A		M12x1	60	15	42	8
E57-18GS05-A		M18x1	80	20	60	—
E57-18GU08-A		M18x1	80	20	48	12
E57-30GS10-A		M30x1.5	80	20	60	—
E57-30GU15-A		M30x1.5	80	20	45	15
E57-12GS02-D	10–30 Vdc	M12x1	50	—	50	—
E57-12GU04-D		M12x1	50	—	42	8
E57-12GE08-D		M12x1	50	—	42	8
E57-12GE08-D1		M12x1	50	—	42	8
E57-18GS05-D		M18x1	55	5	50	—
E57-18GU08-D		M18x1	55	5	38	12
E57-18GE16-D		M18x1	55	5	38	12
E57-18GE16-D1		M18x1	55	5	38	12
E57-30GS10-D		M30x1.5	55	5	50	—
E57-30GU15-D		M30x1.5	55	5	35	15
E57-30GE25-D		M30x1.5	55	5	35	15
E57-30GE25-D1		M30x1.5	55	5	35	15

Connector Models

Two-Wire Sensors



Catalog Number ①	Operating Voltage	A	B	C	D	E
E57-12GS02-AAB	20–250 Vac	M12x1	68	16	42	—
E57-12GU04-AAB		M12x1	68	16	34	8
E57-18GS05-AAB		M18x1	91	20	60	—
E57-18GU08-AAB		M18x1	91	20	48	12
E57-18GE16-AAB		M18x1	79.2	15	37	11.5
E57-30GS10-AAB		M30x1.5	80	20	60	—
E57-30GU15-AAB		M30x1.5	91	20	45	15
E57-12GS02-DDB	10–30 Vdc	M12x1	69	16	42	—
E57-12GU04-DDB		M12x1	68	16	34	8
E57-12GE08-DDB		M12x1	68	10	50	8
E57-12GE08-D1DB		M12x1	68	10	50	8
E57-18GS05-DDB		M18x1	76	15	61	—
E57-18GU08-DDB		M18x1	80	15	49	12
E57-18GE16-DDB		M18x1	79	15	52	12
E57-30GS10-DDB		M30x1.5	75	15	60	—
E57-30GU15-DDB		M30x1.5	79	15	45	15
E57-30GE25-DDB		M30x1.5	78	15	48	15

Note

① Normally closed models are dimensionally indicated to equivalent normally open models.

AccuProx Analog Sensors

Contents

AccuProx Analog Sensors

Product Description

The AccuProx from Eaton's Electrical Sector is a high performance analog inductive proximity sensor. The AccuProx family of analog sensors provide unmatched sensing range, linearity and resolution in an affordable and compact tubular package.

Unlike standard inductive sensors, which send an open or close signal upon target presence or absence, AccuProx analog sensors provide an electrical signal that varies in proportion to the position of the metal target within its sensing range. This makes AccuProx ideal for applications requiring precise position sensing and measurement.

The sensing performance of AccuProx sets it apart from traditional analog inductive designs. Utilizing components from the cutting-edge iProx family, AccuProx provides sensing ranges of three to four times that of typical tubular analog inductive sensors—all without compromising accuracy.

Unlike many competitive products, which are often hampered by an "S-shaped" output curve, AccuProx outputs are linear.

AccuProx has the range and precision to solve your most difficult measurement applications.

Application Description

Typical Applications

- Part positioning
- Distance, size and thickness measurement
- General inspection and error proofing, such as material imperfection or blemish detection
- Eccentricity or absolute angle detection
- Identification of different metals

See the Application Guide on **Page V8-T3-50** for more detail.

Features

- Extended linear sensing range of up to 25 millimeters—three times longer than standard tubular analog inductive sensors
- Outputs available in current (4–20 or 0–20 mA) and voltage (0–10 V)
- High output resolution and repeatability for applications requiring precision sensing performance
- Robust stainless steel barrel, shock-resistant front cap, polycarbonate end bell and impact-absorbing potting compound
- Ideal for extreme temperature or high pressure washdown environments
- High noise immunity of 20 V/m prevents many problems associated with electrical noise

Standards and Certifications

- UL Listed, E166051
- UL Tested to Canadian safety standards
- CE
- RoHS Compliant

c UL us LISTED CE RoHS COMPLIANT

⚠ 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

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.

Application Guide

Presenting AccuProx—Unmatched Analog Range in a Proven Package

Historically, analog sensors have been limited by very short sensing ranges—as little as one or two millimeters. By utilizing technology first perfected in the iProx family of digital inductive sensors, AccuProx can sense objects as far as 25 millimeters. This extended range can be achieved without making compromises often found in competitive products, such as reduced output accuracy.

AccuProx utilizes many of the proven materials found in other tubular sensor families. The threaded barrel and included mounting nuts are made of stainless steel, which exhibits superior corrosion and abrasion resistance versus nickel-plated brass. AccuProx also features a proprietary internal potting compound that absorbs impacts and vibration while sealing out moisture. The materials used in the construction of AccuProx are time-tested and proven to work.

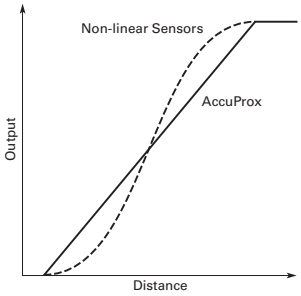
High Output Accuracy

Analog inductive sensors are often used in applications that require a higher level of precision than a standard digital sensor. For example, applications such as part inspection require a sensor that can detect very small variances. AccuProx has been designed with these applications in mind.

Output accuracy is determined by the repeat accuracy, linearity, resolution and response time of the sensor.

Repeat accuracy refers to the variations in sensing distance between successive sensor operations due to component tolerances, where all operating conditions are kept the same. The repeat accuracy of an 18 millimeter, unshielded AccuProx sensor is less than 20 micrometers.

Linearity refers to the shape of the output curve. Many competitive analog sensors exhibit a wavy or "S-shaped" output curve. This means that a change in target distance may not always translate into an equivalent change in output, particularly at the innermost and outermost ranges of a non-linear analog sensor. AccuProx features a linear output. See the diagram below for an example of AccuProx versus a non-linear competitive offering.

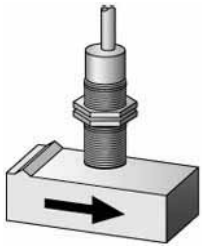


Resolution refers to the number of "steps" in the sensor output. A higher resolution is ideal because it will allow the sensor to detect smaller changes in target position.

An 18 millimeter, unshielded AccuProx features more than 350 output steps, ensuring consistent performance.

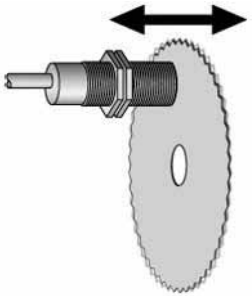
Typical Analog Applications

Material Imperfection or Blemish Detection



Eccentricity or Absolute Angle Detection

Saw Blade Deflection



Product Selection

AccuProx Analog Sensors

Three-/Four-Wire Sensors

	Operating Voltage	Sensing Range ①	Shielding	Connection Type	Current (0–20 mA) and Voltage (0–10 V) Output ② Catalog Number	Current (4– 20 mA) Output Only ② Catalog Number
12 mm 	**12 mm Diameter**					
	15–30 Vdc	0.5–4 mm	Shielded	4-pin micro DC connector	**E59-A12A104D01-CV** ⠿	**E59-A12A104D01-C1** ⠿
				4-pin micro DC pigtail	**E59-A12A104D01P-CV** ⠿	**E59-A12A104D01P-C1** ⠿
				2-meter cable	**E59-A12A104C02-CV**	**E59-A12A104C02-C1**
		1–8 mm	Unshielded	4-pin micro DC connector	**E59-A12C108D01-CV** ⠿	**E59-A12C108D01-C1** ⠿
				4-pin micro DC pigtail	**E59-A12C108D01P-CV** ⠿	**E59-A12C108D01P-C1** ⠿
				2-meter cable	**E59-A12C108C02-CV**	**E59-A12C108C02-C1**
18 mm 	**18 mm Diameter**					
	15–30 Vdc	1–7 mm	Shielded	4-pin micro DC connector	**E59-A18A107D01-CV** ⠿	**E59-A18A107D01-C1** ⠿
				4-pin micro DC pigtail	**E59-A18A107D01P-CV** ⠿	**E59-A18A107D01P-C1** ⠿
				2-meter cable	**E59-A18A107C02-CV**	**E59-A18A107C02-C1**
		1–15 mm	Unshielded	4-pin micro DC connector	**E59-A18C115D01-CV** ⠿	**E59-A18C115D01-C1** ⠿
				4-pin micro DC pigtail	**E59-A18C115D01P-CV** ⠿	**E59-A18C115D01P-C1** ⠿
				2-meter cable	**E59-A18C115C02-CV**	**E59-A18C115C02-C1**
30 mm 	**30 mm Diameter**					
	15–30 Vdc	1–12 mm	Shielded	4-pin micro DC connector	**E59-A30A112D01-CV** ⠿	**E59-A30A112D01-C1** ⠿
				4-pin micro DC pigtail	**E59-A30A112D01P-CV** ⠿	**E59-A30A112D01P-C1** ⠿
				2-meter cable	**E59-A30A112C02-CV**	**E59-A30A112C02-C1**
		1–25 mm	Unshielded	4-pin micro DC connector	**E59-A30C125D01-CV** ⠿	**E59-A30C125D01-C1** ⠿
				4-pin micro DC pigtail	**E59-A30C125D01P-CV** ⠿	**E59-A30C125D01P-C1** ⠿
				2-meter cable	**E59-A30C125C02-CV**	**E59-A30C125C02-C1**

Compatible Connector Cables

Standard Cables ③

	Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number
Micro-Style Straight Female 	**Micro-Style, Straight Female**						
	DC	4-pin, 3-wire	22 AWG	6.0 ft (2m)	 1-Brown 2-No Wire 3-Blue 4-Black	**CSDS4A3CY2202**	**CSDS4A3RY2202**
	DC	4-pin, 4-wire	22 AWG	6.0 ft (2m)	 1-Brown 2-White 3-Blue 4-Black	**CSDS4A4CY2202**	**CSDS4A4RY2202**

Notes

⠿ See listing of compatible connector cables above.

① Published range data is based on a 1 mm thick square target made of Type FE 360 steel per ISO Standard 630.

② Models available in custom output configurations (for example, 1–5 V, 0–5 V). Contact factory for details.

③ For a full selection of connector cables, see **Tab 10**, **section 10.1**.

Technical Data and Specifications

AccuProx Analog Sensors

Description	12 mm Models Shielded	12 mm Models Unshielded	18 mm Models Shielded	18 mm Models Unshielded	30 mm Models Shielded	30 mm Models Unshielded
Performance						
Analog operating range ①	0.5–4 mm	1–8 mm	1–7 mm	1–15 mm	1–12 mm	1–25 mm
Temperature range	–40 to 158 °F (–40 to 70 °C)	–40 to 158 °F (–40 to 70 °C)	–40 to 158 °F (–40 to 70 °C)	–40 to 158 °F (–40 to 70 °C)	–40 to 158 °F (–40 to 70 °C)	–40 to 158 °F (–40 to 70 °C)
Temperature drift	<± 10%	<± 10%	<± 10%	<± 10%	<± 10%	<± 10%
Conformity	<± 10%	<± 10%	<± 10%	<± 10%	<± 10%	<± 10%
Repeat accuracy	<25 µm ②	<20 µm ②	<40 µm ②	<20 µm ②	<50 µm ②	<30 µm ②
Minimum repeat accuracy	<3.0% at max. range	<1.1% at max. range	<2.2% at max. range	<1.2% at max. range	<1.2% at max. range	<0.8% at max. range
Recovery time	<1.0 ms	<1.1 ms	<1.5 ms	<2.0 ms	<2.0 ms	<3.0 ms
Response time	200 Hz	100 Hz	200 Hz	100 Hz	140 Hz	100 Hz
Linearity tolerance	<± 1.0% of full scale	<± 1.0% of full scale	<± 1.0% of full scale	<± 1.0% of full scale	<± 1.0% of full scale	<± 1.0% of full scale
Resolution	23 µm max.	16 µm max.	40 µm max.	21 µm max.	50 µm max.	30 µm max.
Electrical						
Style	AccuProx Analog, three-/four-wire DC	AccuProx Analog, three-/four-wire DC	AccuProx Analog, three-/four-wire DC	AccuProx Analog, three-/four-wire DC	AccuProx Analog, three-/four-wire DC	AccuProx Analog, three-/four-wire DC
Operating voltage	15–30 Vdc	15–30 Vdc	15–30 Vdc	15–30 Vdc	15–30 Vdc	15–30 Vdc
Current output signal	0–20 mA or 4–20 mA by model	0–20 mA or 4–20 mA by model	0–20 mA or 4–20 mA by model	0–20 mA or 4–20 mA by model	0–20 mA or 4–20 mA by model	0–20 mA or 4–20 mA by model
Current output load resistance	400–500 ohms	400–500 ohms	400–500 ohms	400–500 ohms	400–500 ohms	400–500 ohms
Current output ripple content	± 40 µA max.	± 40 µA max.	± 40 µA max.	± 40 µA max.	± 40 µA max.	± 40 µA max.
Current output minimum change	30 µA	20 µA	50 µA	28 µA	66 µA	40 µA
Voltage output signal ③	0–10 V	0–10 V	0–10 V	0–10 V	0–10 V	0–10 V
Voltage output load resistance	4.7–5.0 kohm (2.5 mA max.)	4.7–5.0 kohm (2.5 mA max.)	4.7–5.0 kohm (2.5 mA max.)	4.7–5.0 kohm (2.5 mA max.)	4.7–5.0 kohm (2.5 mA max.)	4.7–5.0 kohm (2.5 mA max.)
Voltage output ripple content	± 10 mV max.	± 10 mV max.	± 10 mV max.	± 10 mV max.	± 10 mV max.	± 10 mV max.
Voltage output minimum change	15 mV	10 mV	25 mV	14 mV	33 mV	20 mV
Burden current	<20 mA	<20 mA	<20 mA	<20 mA	<20 mA	<20 mA
Output LED	Dual-color, 360° viewable	Dual-color, 360° viewable	Dual-color, 360° viewable	Dual-color, 360° viewable	Dual-color, 360° viewable	Dual-color, 360° viewable
Short-circuit protection	Incorporated ④	Incorporated ④	Incorporated ④	Incorporated ④	Incorporated ④	Incorporated ④
Wire breakage protection	Incorporated	Incorporated	Incorporated	Incorporated	Incorporated	Incorporated
Reverse polarity protection	Incorporated	Incorporated	Incorporated	Incorporated	Incorporated	Incorporated
Physical						
Size	See Dimensions on **Page V8-T3-54**.					
Enclosure protection	NEMA 4, 4X, 6, 6P, 13	NEMA 4, 4X, 6, 6P, 13	NEMA 4, 4X, 6, 6P, 13	NEMA 4, 4X, 6, 6P, 13	NEMA 4, 4X, 6, 6P, 13	NEMA 4, 4X, 6, 6P, 13
Shock	30 g half-sine at 11 ms	30 g half-sine at 11 ms	30 g half-sine at 11 ms	30 g half-sine at 11 ms	30 g half-sine at 11 ms	30 g half-sine at 11 ms
Vibration	10–55 Hz, 1 mm amplitude	10–55 Hz, 1 mm amplitude	10–55 Hz, 1 mm amplitude	10–55 Hz, 1 mm amplitude	10–55 Hz, 1 mm amplitude	10–55 Hz, 1 mm amplitude
Housing material	Stainless steel, polycarbonate end bell, polyphenylene sulfide front cap	Stainless steel, polycarbonate end bell, polyphenylene sulfide front cap	Stainless steel, polycarbonate end bell, polyphenylene sulfide front cap	Stainless steel, polycarbonate end bell, polyphenylene sulfide front cap	Stainless steel, polycarbonate end bell, polyphenylene sulfide front cap	Stainless steel, polycarbonate end bell, polyphenylene sulfide front cap
Termination	Micro-connector, potted cable, 2m; Pigtail, micro-connector, 2m	Micro-connector, potted cable, 2m; Pigtail, micro-connector, 2m	Micro-connector, potted cable, 2m; Pigtail, micro-connector, 2m	Micro-connector, potted cable, 2m; Pigtail, micro-connector, 2m	Micro-connector, potted cable, 2m; Pigtail, micro-connector, 2m	Micro-connector, potted cable, 2m; Pigtail, micro-connector, 2m

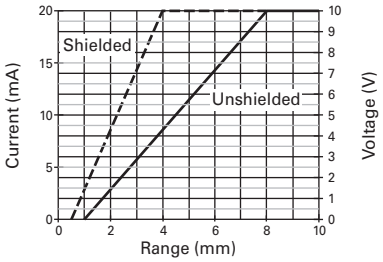
Notes

① Published range data is based on a 1 mm thick square target made of Type FE 360 steel per ISO Standard 630.
② The sensor achieves its maximum repeat accuracy after warming up for a period of at least one hour.
③ Voltage outputs available on models ending in **-CV**.
④ Continuous short-circuits can exceed power dissipation ratings and cause eventual destruction.

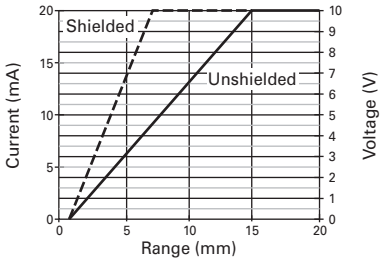
AccuProx Analog Performance Graphs

Linear Output

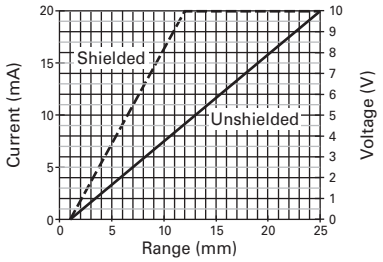
12 mm



18 mm

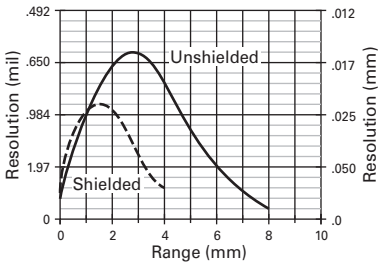


30 mm

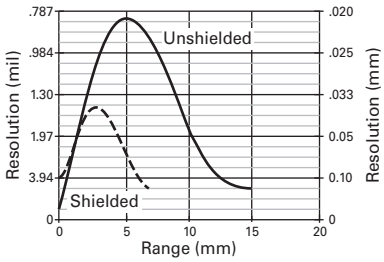


Measurement Resolution ①

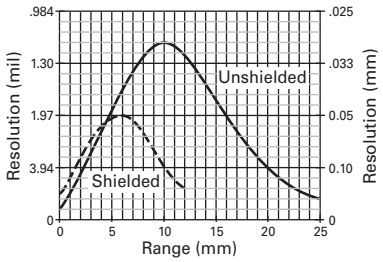
12 mm



18 mm

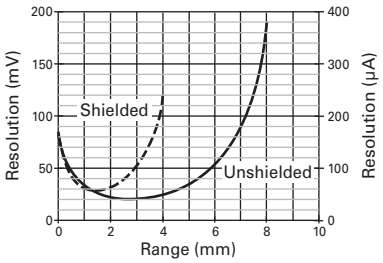


30 mm

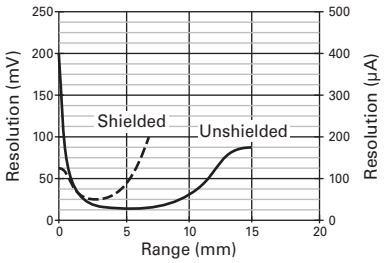


Output Resolution ②

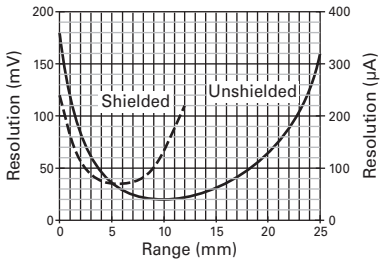
12 mm



18 mm



30 mm



Notes

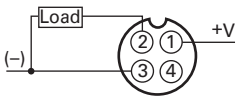
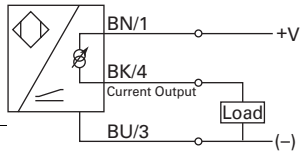
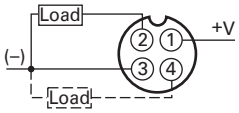
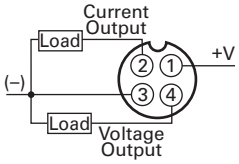
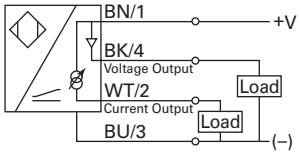
① Measurement resolution is the sensor's ability to detect a change in target position. The measurement resolution is the finest at the highest point in the curve.

② Output resolution is the change in output signal relative to target position. The minimum change in output resolution is defined by the lowest point in the curve.

Wiring Diagrams

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

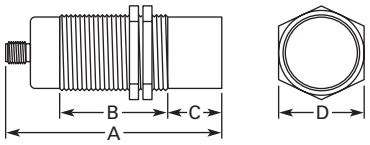
AccuProx Analog Sensors

Style	Output(s)	Micro-Connector Models	Cable and Pigtail Models
12 mm diameter models ending in **-C1** ①	Current: 4–20 mA		
18 and 30 mm diameter models ending in **-C1** ①			
Models ending in **-CV**	Current: 0–20 mA Voltage: 0–10 V		

Dimensions

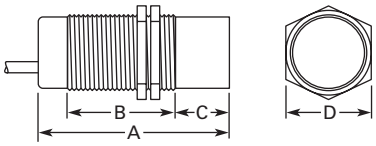
Approximate Dimensions in Inches (mm)

Micro-Connector Models



Size	Shielding	A	B	C	D
12 mm	Shielded	3.05 (77.5)	1.98 (50.3)	0.02 (0.50)	0.67 (17)
	Unshielded	3.05 (77.5)	1.64 (41.6)	0.36 (9)	0.67 (17)
18 mm	Shielded	2.73 (69.3)	2.00 (50.9)	0.02 (0.50)	0.94 (24)
	Unshielded	2.73 (69.3)	1.47 (37.4)	0.55 (14)	0.94 (24)
30 mm	Shielded	2.92 (74.1)	2.13 (54.1)	0.03 (0.75)	1.41 (36)
	Unshielded	2.92 (74.1)	1.41 (35.8)	0.75 (19)	1.41 (36)

Cable and Pigtail Models



Size	Shielding	A	B	C	D
12 mm	Shielded	2.46 (62.4)	1.98 (50.3)	0.02 (0.5)	0.67 (17)
	Unshielded	2.46 (62.4)	1.64 (41.6)	0.36 (9)	0.67 (17)
18 mm	Shielded	2.54 (64.5)	2.00 (50.9)	0.02 (0.5)	0.94 (24)
	Unshielded	2.54 (64.5)	1.47 (37.4)	0.55 (14)	0.94 (24)
30 mm	Shielded	2.74 (69.6)	2.13 (54.1)	0.03 (0.75)	1.41 (36)
	Unshielded	2.74 (69.6)	1.41 (35.8)	0.75 (19)	1.41 (36)

Note

① For models ending in **-C1** (current output only models), pins 2 and 4 are intentionally connected.
Do not connect outputs of **-C1** models to separate loads—this sensor should only be connected to a single-output load.

Ferrous Only Tubular Sensors

Contents

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)

Standards and Certifications

- CSA Certified
- Products certified by CSA for US
- CE
- RoHS Compliant

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

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

Ferrous Only Tubular Sensors

3

Two-Wire Sensors

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

Three-Wire Sensors

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

Compatible Connector Cables

Standard Cables ①

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

Accessories

Ferrous Only Tubular Sensors

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

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

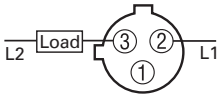
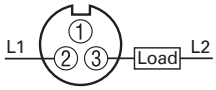
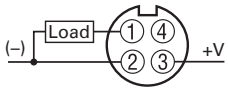
Ferrous Only Tubular Sensors

Description	Two-Wire AC/DC Sensors	Three-Wire DC Sensors
Operating voltage	20–250 Vac/dc	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	10 V maximum	1.5 V 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	30 g sine wave, 11 ms per IEC68-2-76	30 g 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.

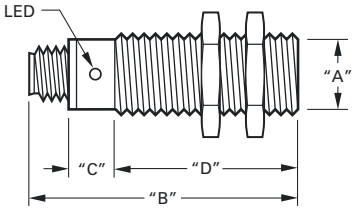
Ferrous Only Tubular Sensors

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

Dimensions

Approximate Dimensions in Inches (mm)

Ferrous Only Tubular Sensors



Connector Models

Catalog Number	A	B	C	D
Two-Wire Models				
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)
Three-Wire Models				
E57FAL18T111SD	M18 x 1	3.11 (79)	1.14 (29)	1.97 (50)

3

Metal Face Sensors

Contents

Metal Face Sensors

Product Description

Metal Face Inductive Proximity Sensors by Eaton's Electrical Sector incorporate tough stainless steel sensing faces in place of the plastic faces found in standard sensors. This provides a higher level of protection for more reliable operation and longer life in harsh environments.

The sensors stand up to abrasion and impact caused by flying metal chips, grit, and misaligned or vibrating targets. In addition, the stainless steel body resists corrosion and chemical attack.

Common sensor diameters, voltage styles and wiring connections make it easy to retrofit your existing, damaged sensors. Solve the problem of damaged sensors permanently with Eaton's Metal Face Sensors.

Features

- Two-wire AC/DC models and three-wire DC models are compatible with your existing wiring
- Common 12 mm, 18 mm and 30 mm housing diameters allow easy changeout of existing damaged sensors
- The 20 mil stainless steel sensing face is thicker than competing units for a higher level of protection
- The stainless steel body is damage and corrosion resistant
- Wide operating temperature range: –13 to 158 °F (–25 to 70 °C)

Standards and Certifications

- CSA Certified
- Products certified by CSA for US
- CE
- RoHS Compliant

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

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

Metal Face Sensors

Two-Wire Sensors

	Operating Voltage	Sensing Range (Sn)	Shielding	Connection Type	NO Output Catalog Number
12 mm 	**12 mm Diameter**				
	20–250 Vac/dc 50/60 Hz	2 mm	Shielded	3-pin micro AC connector	**E57FAL12A2SA-M**
30 mm 	**30 mm Diameter**				
	20–250 Vac/dc 50/60 Hz	10 mm	Shielded	3-pin micro AC connector	**E57FAL30A2SA-M**

Three-Wire Sensors

	Operating Voltage	Sensing Range (Sn)	Shielding	Connection Type	NO Output Catalog Number
12 mm 	**12 mm Diameter**				
	10–30 Vdc	2 mm	Shielded (PNP)	4-pin micro DC connector	**E57FAL12T111SD-M**
18 mm 	**18 mm Diameter**				
	10–30 Vdc	5 mm	Shielded (PNP)	4-pin micro DC connector	**E57FAL18T111SD-M**

Compatible Connector Cables

Standard Cables ①

	Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number
Micro-Style Straight Female 	**Micro-Style, Straight Female**						
	AC	3-pin, 3-wire	22 AWG	6.0 ft (2m)	 1-Green 2-Red/Black 3-Red/White	**CSAS3F3CY2202**	**CSAS3F3RY2202**
	DC	4-pin, 4-wire	22 AWG	6.0 ft (2m)	 1-Brown 2-White 3-Blue 4-Black	**CSDS4A4CY2202**	**CSDS4A4RY2202**

Notes

See listing of compatible connector cables above.

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

Accessories

Metal Face Sensors

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

Technical Data and Specifications

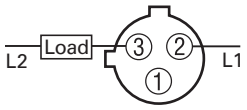
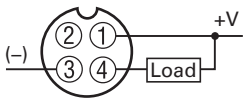
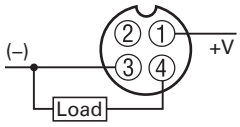
Metal Face Sensors

Description	Two-Wire AC/DC Sensors	Three-Wire DC Only Sensors
Operating voltage	20–250 Vac/dc	10–30 Vdc
Maximum load current	100 mA	100 mA
Switching frequency		
12 mm	15 Hz	2000 Hz
18 mm	—	1000 Hz
30 mm	—	300 Hz
Leakage current	2.5 mA maximum	600 µA maximum
Voltage drop	10 V maximum	1.5 V 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	<200 ms	<200 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	30 g sine wave, 11 ms per IEC68-2-76	30 g 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	303 stainless steel	303 stainless steel
Face thickness	20 mils	20 mils

Wiring Diagrams

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

Metal Face Sensors

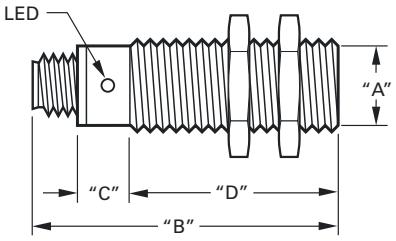
Operating Voltage	Output	Micro-Connector Models (Face View Male Shown)
Two-Wire Sensors		
20–250 Vac/dc 50/60 Hz	NO	
Three-Wire Sensors		
10–30 Vdc	NO (NPN)	
	NO (PNP)	

Dimensions

Approximate Dimensions in Inches (mm)

Metal Face Sensors

Connector Models



Catalog Number	A	B	C	D
Two-Wire Models				
E57FAL12A2SA-M	M x 12	2.67 (68)	1.10 (28)	1.58 (40)
E57FAL30A2SA-M	M x 30	3.70 (94)	1.34 (34)	2.36 (60)
Three-Wire Models				
E57FAL12T111SD-M	M x 12	2.67 (68)	1.02 (26)	1.65 (42)
E57FAL18T110SD-M	M x 18	3.11 (79)	1.14 (29)	1.97 (50)
E57FAL18T111SD-M	M x 18	3.11 (79)	1.14 (29)	1.97 (50)

3

High Current Output Sensors

Contents

High Current Output Sensors

Product Description

Now there is an alternative to limit switches for position sensing on industrial vehicles. High Current Output Sensors feature a continuous output current rating from 2 to 8 A. These sensors from Eaton's Electrical Sector are ideally suited to handle high current loads found on such industrial vehicles as aerial lift trucks, fork lifts, refuse trucks, cement mixers, dump trucks, hook and ladder trucks, front end loaders, farm equipment and hundreds of other vehicles that are constantly subjected to mechanical (shock, vibration, collisions) and environmental (dirt, grease, ice, rain) abuse that create havoc with mechanical devices.

Features

- Solid-state output can handle up to 8 A continuous
- Ideal for vehicle use to replace mechanical limit switches, typically required to handle high currents
- Wide voltage and temperature range covers most vehicle power supplies and operating environments
- Normally Open and Normally Closed isolated outputs
- SJO cable is available in custom lengths
- Dual colored 360° LED indicating light, green as power ON and red as output

Standards and Certifications

- RoHS Compliant

RoHS COMPLIANT

⚠ 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

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

High Current Output Sensors

30 mm

Four-Wire Sensors

Operating Voltage	Sensing Range	Shielding	Output Type	Output Rating Continuous	Output Rating <100 ms Pulse	Connection Type ①	Catalog Number
30 mm Diameter							
10–55 Vdc	10 mm	Shielded	NO and NC (PNP)	3.5 A	20 A	2-meter cable	**E57-30JS10-H**

30 mm

Six-Wire Sensors ②

Operating Voltage	Sensing Range	Shielding	Output Type	Output Rating Continuous	Output Rating <100 ms Pulse	Connection Type ①	Catalog Number
30 mm Diameter							
10–30 Vdc	10 mm	Shielded	NO and NO, or NC and NC (NPN or PNP)	8 A	50 A	2-meter cable	**E57-30HS10-K**

Accessories

High Current Output Sensors

Description	Reference
Mounting brackets	See **Tab 8, section 8.2**
Replacement mounting nuts and other accessories	See **Tab 8, section 8.3**

Notes

① For additional cable length other than 2-meter, add desired length in meters to listed catalog number. Example: For an E57-30JS10-H with a 5-meter cable, order E57-30JS10-H**5**.

② 50 Amp surge, 12 Amp at 50% duty cycle and 8 Amp continuous.

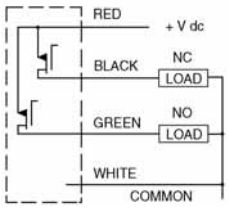
Technical Data and Specifications

High Current Output Sensors

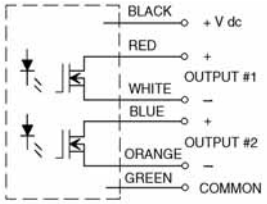
Description	Four-Wire Sensors	Six-Wire Sensors
Operating voltage	10 to 55 Vdc	10 to 30 Vdc
Switching rate	250 Hz	100 Hz
Off-state current	100 Aμ maximum	100 Aμ maximum
Voltage drop	1.2 V	2.0 V
Burden current	10 mA at 55 volts	30 mA at 30 volts
Time delay before availability	<100 ms	<100 ms
Output indicator LED	360° visibility	360° visibility
Output type	Solid-state	Solid-state, isolated
Protection	Transient and power on false pulse	Transient and power on false pulse
Enclosure ratings	NEMA 4, 4X, 6, 6P, 12 and 13 (IEC IP67)	NEMA 4, 4X, 6, 6P, 12 and 13 (IEC IP67)
Ambient temperature range	–40 to 158 °F (–40 to 70 °C)	–40 to 158 °F (–40 to 70 °C)
Barrel material	303 stainless steel	303 stainless steel
Cable	2m standard SJO water resistive (18 AWG)	2m standard SJO water resistive (18 AWG)
Shock	30 g sine wave, 11 ms	30 g sine wave, 11 ms
Vibration	10 to 55 Hz, 2 mm amplitude in all 3 planes	10 to 55 Hz, 2 mm amplitude in all 3 planes

Wiring Diagrams

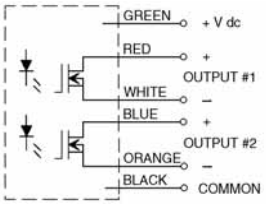
Four-Wire—PNP



Six-Wire—NO/NO Output Configuration



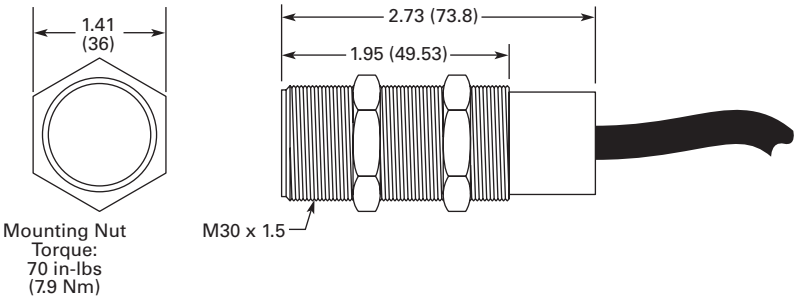
Six-Wire—NC/NC Output Configuration



Dimensions

Approximate Dimensions in Inches (mm)

High Current Output Sensors



Small Diameter (4, 5, 6.5, 8 mm) Sensors

Contents

3

Small Diameter (4, 5, 6.5, 8 mm) Sensors

Product Description

These unique Inductive Proximity Sensors by Eaton's Electrical Sector are designed to be used in extremely small spaces. A wide variety of models are available with housing diameters from 8 mm all the way down to 4 mm, allowing you to choose the one that best fits your application. The sensors are three-wire devices that operate from 10 to 30 Vdc. Both shielded and unshielded versions are available.

Application Description

Typical Applications

- Automation equipment
- Robotics
- Machine tool
- Counting
- Sorting

Features

- Small 4, 5, 6.5 and 8 mm diameters for use in applications with limited space for mounting sensors
- Stainless steel housings
- All models include an LED indicator to show output status
- Short circuit and reverse polarity protection
- Rated NEMA 4, 4X, 6, 6P, 12 and 13 (IP67) for high resistance to environmental factors

Standards and Certifications

- CE
- RoHS Compliant
- 8 mm standard models only:
  - CSA Certified, 224447
  - Products certified by CSA for US

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

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

Small Diameter (4, 5, 6.5, 8 mm) Sensors

3

Three-Wire Sensors

	Operating Voltage	Sensing Range (Sn)	Shielding	Connection Type	NO Output Catalog Number	NC Output Catalog Number
4 mm 	**4 mm Diameter (Unthreaded)**					
	10–30 Vdc	0.8 mm	Shielded (NPN)	2-meter cable	**E57EAL4T110SP**	—
				3-pin nano-connector	**E57EAL4T110SN**	—
			Shielded (PNP)	2-meter cable	**E57EAL4T111SP**	—
				3-pin nano-connector	**E57EAL4T111SN**	—
	5 mm Diameter					
5 mm 	10–30 Vdc	0.8 mm	Shielded (NPN)	2-meter cable	**E57EAL5T110SP**	—
				3-pin nano-connector	**E57EAL5T110SN**	—
			Shielded (PNP)	2-meter cable	**E57EAL5T111SP**	—
				3-pin nano-connector	**E57EAL5T111SN**	—
	6.5 mm Diameter (Unthreaded)					
6.5 mm 	10–30 Vdc	1 mm	Shielded (NPN)	2-meter cable	**E57EAL6T110SP**	—
				3-pin nano-connector	**E57EAL6T110SN**	—
				4-pin micro DC connector	**E57EAL6T110SD**	—
			Shielded (PNP)	2-meter cable	**E57EAL6T111SP**	—
				3-pin nano-connector	**E57EAL6T111SN**	—
				4-pin micro DC connector	**E57EAL6T111SD**	—
		2 mm	Unshielded (NPN)	2-meter cable	**E57EAL6T110EP**	—
				3-pin nano-connector	**E57EAL6T110EN**	—
			Unshielded (PNP)	2-meter cable	**E57EAL6T111EP**	—
				3-pin nano-connector	**E57EAL6T111EN**	—
	8 mm Diameter Short Body					
8 mm Short Body 	10–30 Vdc	1 mm	Shielded (NPN)	2-meter cable	**E57EAL8T110SP**	**E57EBL8T110SP**
				3-pin nano-connector	**E57EAL8T110SN**	**E57EBL8T110SN**
				4-pin micro DC connector	**E57EAL8T110SD**	**E57EBL8T110SD**
			Shielded (PNP)	2-meter cable	**E57EAL8T111SP**	**E57EBL8T111SP**
				3-pin nano-connector	**E57EAL8T111SN**	**E57EBL8T111SN**
				4-pin micro DC connector	**E57EAL8T111SD**	**E57EBL8T111SD**
		2 mm	Unshielded (NPN)	2-meter cable	**E57EAL8T110EP**	**E57EBL8T110EP**
				3-pin nano-connector	**E57EAL8T110EN**	**E57EBL8T110EN**
				4-pin micro DC connector	**E57EAL8T110ED**	**E57EBL8T110ED**
			Unshielded (PNP)	2-meter cable	**E57EAL8T111EP**	**E57EBL8T111EP**
				3-pin nano-connector	**E57EAL8T111EN**	**E57EBL8T111EN**
				4-pin micro DC connector	**E57EAL8T111ED**	**E57EBL8T111ED**

Note

See listing of compatible connector cables on **Page V8-T3-68**.

Three-Wire Sensors, continued

8 mm Standard Length

Operating Voltage	Sensing Range	Shielding	Output Type	Connection Type	NO Output Catalog Number	NC Output Catalog Number
8 mm Diameter Standard Length						
10–30 Vdc	1 mm	Shielded	NPN	2-meter cable	**E57-08GS01-C**	**E57-08GS01-C1**
				3-pin nano-connector	**E57-08GS01-CNB**	**E57-08GS01-C1NB**
				4-pin micro DC connector	**E57-08GS01-CDB**	**E57-08GS01-C1DB**
			PNP	2-meter cable	**E57-08GS01-G**	**E57-08GS01-G1**
				3-pin nano-connector	**E57-08GS01-GNB**	**E57-08GS01-G1NB**
				4-pin micro DC connector	**E57-08GS01-GDB**	**E57-08GS01-G1DB**
	3 mm (extended range)		NPN	2-meter cable	**E57-08GE03-C**	**E57-08GE03-C1**
				3-pin nano-connector	**E57-08GE03-CNB**	**E57-08GE03-C1NB**
				4-pin micro DC connector	**E57-08GE03-CDB**	**E57-08GE03-C1DB**
			PNP	2-meter cable	**E57-08GE03-G**	**E57-08GE03-G1**
				3-pin nano-connector	**E57-08GE03-GNB**	**E57-08GE03-G1NB**
				4-pin micro DC connector	**E57-08GE03-GDB**	**E57-08GE03-G1DB**
	2 mm	Unshielded	NPN	2-meter cable	**E57-08GU02-C**	**E57-08GU02-C1**
				3-pin nano-connector	**E57-08GU02-CNB**	**E57-08GU02-C1NB**
				4-pin micro DC connector	**E57-08GU02-CDB**	**E57-08GU02-C1DB**
			PNP	2-meter cable	**E57-08GU02-G**	**E57-08GU02-G1**
				3-pin nano-connector	**E57-08GU02-GNB**	**E57-08GU02-G1NB**
				4-pin micro DC connector	**E57-08GU02-GDB**	**E57-08GU02-G1DB**
	6 mm (extended range)		NPN	2-meter cable	**E57-08GE06-C**	**E57-08GE06-C1**
				4-pin micro DC connector	**E57-08GE06-CDB**	**E57-08GE06-C1DB**
			PNP	2-meter cable	**E57-08GE06-G**	**E57-08GE06-G1**
				4-pin micro DC connector	**E57-08GE06-GDB**	**E57-08GE06-G1DB**

Note

See listing of compatible connector cables on **Page V8-T3-68**.

3

Compatible Connector Cables

Standard Cables①

Micro-Style Straight Female

Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number
Micro-Style, Straight Female						
DC	4-pin, 3-wire	22 AWG	6.0 ft (2m)	① ② ④ ③ 1-Brown 2-No Wire 3-Blue 4-Black	**CSDS4A3CY2202**	**CSDS4A3RY2202**
	4-pin, 4-wire	22 AWG	6.0 ft (2m)	① ② ④ ③ 1-Brown 2-White 3-Blue 4-Black	**CSDS4A4CY2202**	**CSDS4A4RY2202**

Nano-Style Straight Female

Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number
Nano-Style, Straight Female						
—	3-pin	24 AWG	6.0 ft (2m)	③ ④ ① 1-Brown 3-Blue 4-Black	**CSNS3A3CY2402**	**CSNS3A3RY2402**

Accessories

Small Diameter Sensors

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

Note

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

Technical Data and Specifications

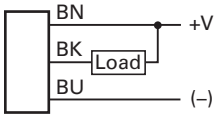
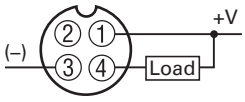
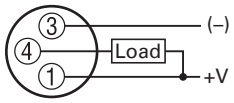
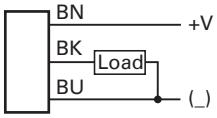
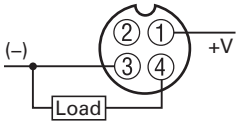
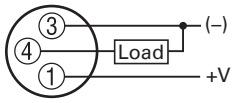
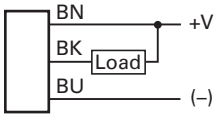
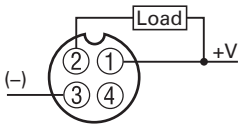
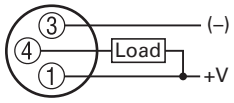
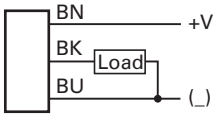
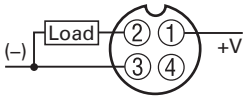
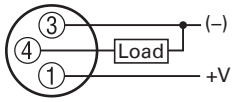
Small Diameter Sensors

Description	Three-Wire DC Only Sensors
Operating voltage	10–30 Vdc
Maximum load current	200 mA
Switching frequency	2 kHz
Leakage current	0.01 mA maximum
Voltage drop	1.5 V maximum
Burden current	10 mA maximum
Protection	Transient, power on false pulse suppression, auto reset short circuit
Switching hysteresis	<15% rated sensing distance
Repeat accuracy	<1% sensing distance
Time delay before availability	<50 ms
Output indicator LED	Lights when output is ON
Operating temperature	–13 to 158 °F (–25 to 70 °C)
Enclosure ratings	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67)
Housing material	Stainless steel
Cable	PVC high flex, oil/water resistant, 22 AWG

Wiring Diagrams

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

Small Diameter Sensors

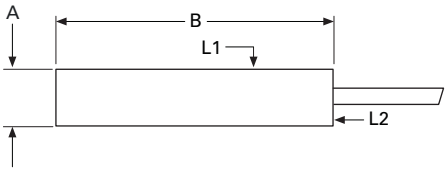
Operating Voltage	Output	Cable Models	Connector Models (Face View Male Shown) Micro	Nano
Three-Wire Sensors				
10–30 Vdc	NO (NPN)			
	NO (PNP)			
	NC (NPN)			
	NC (PNP)			

Dimensions

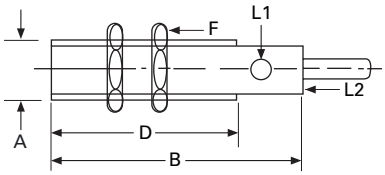
Approximate Dimensions in Inches (mm)

Cable Models

Unthreaded Barrel



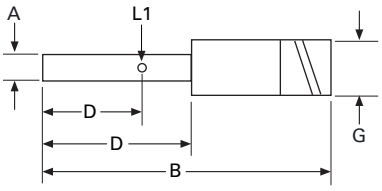
Threaded Barrel



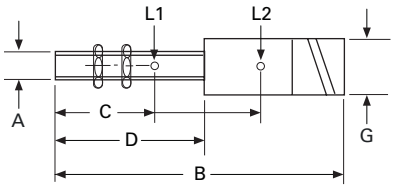
Size A ①	Barrel Type	Length B	D	Thread Size	Nut Width F	Connector Diameter G	LED Location
Cable Models							
4 mm (S, Std)	Unthreaded	1.0 (25)	—	—	—	—	L1
5 mm (S, Std)	Threaded	1.0 (25)	0.8 (21)	M5 x 0.5	SW8	—	L1
6.5 mm (S/U, Std)	Unthreaded	1.8 (45)	—	—	—	—	L2
8 mm Short Body (S/U, Std)	Threaded	1.2 (30)	1.2 (30)	M8 x 1	SW13	—	L2
Standard Length							
8 mm (S, Std)	Threaded	1.77 (45)	1.77 (45)	M8 x 1	SW13	—	L2
8 mm (S, Ext)	Threaded	1.81 (46)	1.57 (40)	M8 x 1	SW13	—	L2
8 mm (U, Std)	Threaded	1.77 (45)	1.61 (41)	M8 x 1	SW13	—	L2
8 mm (U, Ext)	Threaded	1.77 (45)	1.61 (41)	M8 x 1	SW13	—	L2

Connector Models

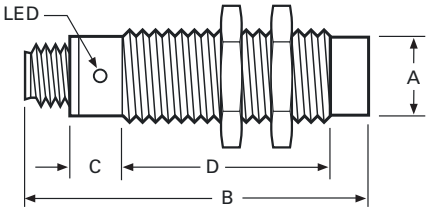
Unthreaded Barrel



Threaded Barrel



Standard Length 8 mm



Size A ①	Barrel Type	Length B	C	D	Thread Size	Nut Width F	Connector Diameter G	LED Location
Nano-Connector Models								
4 mm (S, Std)	Unthreaded	1.6 (40)	0.7 (18)	0.8 (21)	—	—	0.31 (8)	L1
5 mm (S, Std)	Threaded	1.6 (40)	0.7 (18)	0.8 (21)	M5 x 0.5	SW8	0.31 (8)	L1
6.5 mm (S/U, Std)	Unthreaded	2.4 (60)	1.5 (39)	2.0 (50)	—	—	0.31 (8)	L1
8 mm Short Body (S/U, Std)	Threaded	1.8 (45)	1.0 (25)	1.4 (36)	M8 x 1	SW13	0.31 (8)	L1
Standard Length								
8 mm (S, Std)	Threaded	2.36 (60)	0.79 (20)	1.57 (40)	M8 x 1	SW13	0.31 (8)	L2
8 mm (S, Ext)	Threaded	2.40 (61)	0.75 (19)	1.65 (42)	M8 x 1	SW13	0.31 (8)	L2
8 mm (U, Std)	Threaded	2.36 (60)	0.79 (20)	1.42 (36)	M8 x 1	SW13	0.31 (8)	L2
Micro-Connector Models								
6.5 mm (S/U, Std)	Unthreaded	2.9 (70)	1.4 (36)	1.5 (39)	—	—	0.47 (12)	L1
8 mm Short Body (S/U, Std)	Threaded	2.0 (50)	1.6 (40)	1.0 (25)	M8 x 1	SW13	0.47 (12)	L2
Standard Length								
8 mm (S, Std)	Threaded	2.76 (70)	0.83 (21)	1.93 (49)	M8 x 1	SW13	0.47 (12)	L2
8 mm (S, Ext)	Threaded	2.80 (71)	1.02 (26)	1.42 (36)	M8 x 1	SW13	0.47 (12)	L2
8 mm (U, Std)	Threaded	2.76 (70)	0.83 (21)	1.77 (45)	M8 x 1	SW13	0.47 (12)	L2
8 mm (U, Ext)	Threaded	2.76 (70)	1.22 (31)	1.38 (35)	M8 x 1	SW13	0.47 (12)	L2

Note

① U = Unshielded (4 mm cap), S = Shielded; Std = Standard Range, Ext = Extended Range.

E56 Pancake Sensors

Contents

E56 Pancake Sensors

Product Description

The E56 Pancake Sensor from Eaton's Electrical Sector is a high performance inductive proximity sensor. The E56 Pancake provides greater sensing ranges than other inductive sensor package types.

The E56 Pancake family provides convenience and ease of wiring with auto-configurable, complementary outputs. (Auto-configurable outputs automatically detect an NPN or PNP output configuration and switch the sensor accordingly, without user intervention.) Power and output LEDs make trouble-shooting much easier than conventional proximity sensors, which usually only feature output LEDs. These convenience features, combined with the performance of the E56 Pancake, make it an excellent inductive sensing solution for applications requiring an extremely rugged, long-range sensing solution.

Application Description

Typical Applications

- Heavy-duty trucks, cranes and machinery
- Steel mills
- Pipe and rod manufacturing
- Automotive manufacturing
- Amusement parks

Features

- Longest inductive sensing ranges available (up to 100 mm)
- Three sizes to meet your application needs, with maximum ranges of 50, 70 or 100 mm
- Complementary outputs (1NO/1NC) on four-wire DC models
- Auto-configure output technology on four-wire DC models, which automatically detect how the sensor has been wired (NPN or PNP) and switch the sensor without user intervention
- Small diameter, two-wire AC models feature a selector switch inside the housing, enabling output contacts to be used as either NO or NC
- Robust design featuring vibration and impact-absorbing potting compound
- Ideal for extreme temperatures or high pressure washdown environments

Standards and Certifications

- UL Listed, E166051 (DC models only)
- UL Tested to Canadian safety standards
- CE (DC models only)
- RoHS Compliant

c UL us LISTED CE RoHS COMPLIANT

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

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

E56 Pancake Sensors

3

Pancake Style

Two-Wire Sensors

Voltage Type	Output Configuration	Output Contacts	Shielding	Sensing Range	Connector Style	Catalog Number
Pancake Style						
20–250 Vac 45/65 Hz	—	NO or NC	Unshielded	1.57 in (40 mm)	Screw terminals	**E56CDL40A2**
					3-pin mini-connector	**E56CDL40A2B1**
		NO or NC	Unshielded	2 in (50 mm)	Screw terminals	**E56CDL50A2E**
					3-pin mini-connector	**E56CDL50A2EB1**
90–260 Vac 45/65 Hz	—	NO	Unshielded	2.75 in (70 mm) ①	3-pin mini-connector	**E56CAL70B1S1**
		NO	Unshielded	3.94 in (100 mm) ①	3-pin mini-connector	**E56CAL100B1S1**

DC Four-Wire Sensors

Small Diameter

Voltage Type	Output Configuration	Output Contacts	Shielding	Sensing Range	Connector Style	Catalog Number
Small Diameter (79 x 79 x 39 mm)						
10–42 Vdc	NPN/PNP autoconfigure ②	1 NO and 1 NC	Shielded	1.57 in (40 mm)	DC screw	**E56ADL40SA**
					DC 4-pin mini	**E56ADL40SAE01**
					DC 4-pin micro	**E56ADL40SAD01**
			Unshielded	1.57 in (40 mm)	DC screw	**E56ADL40UA**
					DC 4-pin mini	**E56ADL40UAE01**
					DC 4-pin micro	**E56ADL40UAD01**
			Unshielded	2 in (50 mm)	DC screw	**E56ADL50UA**
					DC 4-pin mini	**E56ADL50UAE01**
					DC 4-pin micro	**E56ADL50UAD01**

Medium Diameter

Voltage Type	Output Configuration	Output Contacts	Shielding	Sensing Range	Connector Style	Catalog Number
Medium Diameter (110 x 110 x 41 mm)						
10–42 Vdc	NPN/PNP autoconfigure ②	1 NO and 1 NC	Unshielded	2.75 in (70 mm)	DC 4-pin mini	**E56BDL70UAE01**
					DC 4-pin micro	**E56BDL70UAD01**

Large Diameter

Voltage Type	Output Configuration	Output Contacts	Shielding	Sensing Range	Connector Style	Catalog Number
Large Diameter (172 x 172 x 68 mm)						
10–42 Vdc	NPN/PNP autoconfigure ②	1 NO and 1 NC	Unshielded	3.94 in (100 mm)	DC 4-pin mini	**E56CDL100UAE01**
					DC 4-pin micro	**E56CDL100UAD01**

Notes

See listing of compatible connector cables on **Page V8-T3-73**.

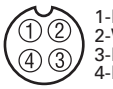
① Includes potentiometer for adjustment of sensing range.

② Autoconfigure technology allows the sensor to automatically adapt to NPN or PNP without user intervention.

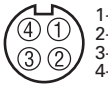
Compatible Connector Cables

Standard Cables ①

Micro-Style Straight Female

Current Rating at 600 V	Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number
Micro-Style, Straight Female							
—	AC	3-pin, 3-wire	22 AWG	6.0 ft (2m)	 1-Green 2-Red/Black 3-Red/White	**CSAS3F3CY2202**	**CSAS3F3RY2202**
				16.4 ft (5m)		**CSAS3F3CY2205**	**CSAS3F3RY2205**
				32.8 ft (10m)		**CSAS3F3CY2210**	**CSAS3F3RY2210**
—	DC	4-pin, 4-wire	22 AWG	6.0 ft (2m)	 1-Brown 2-White 3-Blue 4-Black	**CSDS4A4CY2202**	**CSDS4A4RY2202**
				16.4 ft (5m)		**CSDS4A4CY2205**	**CSDS4A4RY2205**
				32.8 ft (10m)		**CSDS4A4CY2210**	**CSDS4A4RY2210**

Mini-Style Straight Female

Current Rating at 600 V	Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number
Mini-Style, Straight Female							
13 A	—	3-pin, 3-wire	16 AWG	6.0 ft (2m)	 1-Green 2-Black 3-White	**CSMS3F3CY1602**	—
				13.1 ft (4m)		**CSMS3F3CY1604**	—
10 A	AC/DC	4-pin, 4-wire	16 AWG	6.0 ft (2m)	 1-Black 2-Blue 3-Brown 4-White	**CSMS4A4CY1602**	—
				13.1 ft (4m)		**CSMS4A4CY1604**	—
				19.7 ft (6m)		**CSMS4A4CY1606**	—

Note

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

Technical Data and Specifications

Two-Wire

Description	AC Two-Wire Small Diameter	Medium Diameter	Large Diameter
Operating voltage	20–250 Vac	20–250 Vac	20–250 Vac
Load current (maximum)	400 mA	400 mA	400 mA
Off-state leakage	At or above 32 °F (0 °C): <1.7 mA; below 32 °F (0 °C): 2.0 mA	At or above 32 °F (0 °C): <1.7 mA; below 32 °F (0 °C): 2.0 mA	At or above 32 °F (0 °C): <1.7 mA; below 32 °F (0 °C): 2.0 mA
Voltage drop	<10 V (5 V nominal)	<10 V (5 V nominal)	<10 V (5 V nominal)
Outputs	NO or NC (switch selectable)	NO or NC by model	NO or NC by model
Sensing range (maximum)	50 mm	70 mm	100 mm
Range adjustment	Not adjustable	Potentiometer adjustable down to 50% of rated maximum range	Potentiometer adjustable down to 50% of rated maximum range
Standard target size (mild steel)	150 mm	210 mm	300 mm
Frequency of operation	30 Hz	10 Hz	10 Hz
Repeatability	<3%	<3%	<3%
Hysteresis (maximum)	10–15%	10–15%	10–15%
Time delay before availability	300 ms	300 ms	300 ms
Circuit protection	Short-circuit protection with auto reset	Short-circuit protection with auto reset	Short-circuit protection with auto reset
Operating temperature	–13 to 158 °F (–25 to 70 °C) ①	–13 to 158 °F (–25 to 70 °C) ①	–13 to 158 °F (–25 to 70 °C) ①
Temperature drift	±10%	±10%	±10%
Enclosure rating	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67)	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67)	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67)
Indicator LEDs	Output status	Output status	Output status
Materials of construction	PPS housing	PPS housing; aluminum baseplate	PPS housing; aluminum baseplate

Four-Wire

Description	DC Four-Wire Small Diameter	Medium Diameter	Large Diameter
Operating voltage	10–42 Vdc	10–42 Vdc	10–42 Vdc
Load current (maximum)	300 mA	300 mA	300 mA
Burden current	<25 mA	<25 mA	<25 mA
Off-state leakage	<150 µA per output	<150 µA per output	<150 µA per output
Voltage drop	<2.5 V	<2.5 V	<2.5 V
Outputs	1 NO/1 NC (complementary)	1 NO/1 NC (complementary)	1 NO/1 NC (complementary)
Sensing range (maximum)	50 mm	70 mm	100 mm
Range adjustment	Not adjustable	Potentiometer adjustable down to 50% of rated maximum range	Potentiometer adjustable down to 50% of rated maximum range
Standard target size (mild steel)	150 mm	210 mm	300 mm
Frequency of operation	70 Hz	40 Hz	30 Hz
Repeatability	<3%	<3%	<3%
Hysteresis (maximum)	10–15%	10–15%	10–15%
Time delay before availability	300 ms	300 ms	300 ms
Circuit protection	Short-circuit protection with auto reset	Short-circuit protection with auto reset	Short-circuit protection with auto reset
Operating temperature	–13 to 158 °F (–25 to 70 °C) ①	–13 to 158 °F (–25 to 70 °C) ①	–13 to 158 °F (–25 to 70 °C) ①
Temperature drift	±10%	±10%	±10%
Enclosure rating	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67)	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67)	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67)
Indicator LEDs	Green: power; Red: output status	Green: power; Red: output status	Green: power; Red: output status
Materials of construction	PPS housing	PPS housing; aluminum baseplate	PPS housing; aluminum baseplate

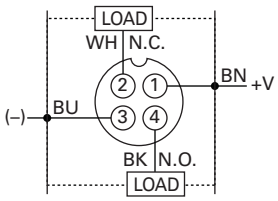
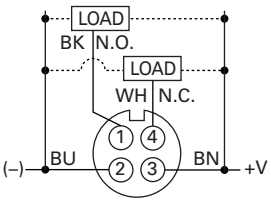
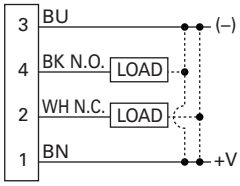
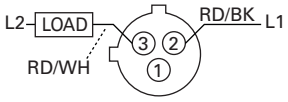
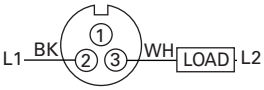
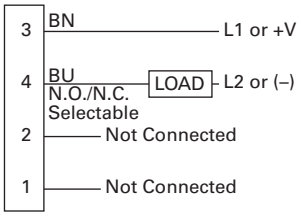
Note

① Small diameter DC unshielded models are rated at –40 °F (–40 °C). All other models can be operated at –40 °F (–40 °C), but range drift will occur.

Wiring Diagrams

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

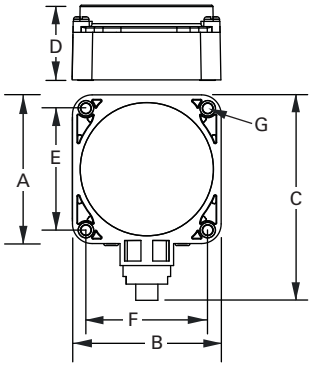
E56 Pancake Sensors

Voltage Type	Micro-Connector Models	Mini-Connector Models	Screw Terminal Models
DC four-wire	 *AutoConfigure enables load to be wired to +V or (–)*	 *AutoConfigure enables load to be wired to +V or (–)*	 *AutoConfigure enables load to be wired to +V or (–)*
AC two-wire			

Dimensions

Approximate Dimensions in Inches (mm)

E56 Pancake Sensors



Model	A (Depth)	B (Width)	C (Depth)	D (Height)	E (Mounting)	F (Mounting)	G (Diameter)
Small Diameter Models							
Micro-connector	3.13 (79.0)	3.13 (79.0)	4.32 (110.0)	1.54 (39.0)	2.56 (65.0)	2.56 (65.0)	0.21 (5.0)
Mini-connector	3.13 (79.0)	3.13 (79.0)	4.67 (119.0)	1.54 (39.0)	2.56 (65.0)	2.56 (65.0)	0.21 (5.0)
Screw terminal	3.13 (79.0)	3.13 (79.0)	3.87 (92.0)	1.54 (39.0)	2.56 (65.0)	2.56 (65.0)	0.21 (5.0)
Medium Diameter Models							
Micro-connector	4.35 (110.0)	4.35 (110.0)	4.94 (125.4)	1.63 (41.0)	3.625 (92.0)	3.625 (92.0)	0.218 (5.5)
Mini-connector	4.35 (110.0)	4.35 (110.0)	5.29 (134.4)	1.63 (41.0)	3.625 (92.0)	3.625 (92.0)	0.218 (5.5)
Large Diameter Models							
Micro-connector	6.75 (171.5)	6.75 (171.5)	7.26 (184.4)	2.66 (67.5)	5.875 (149.0)	5.875 (149.0)	0.266 (7.0)
Mini-connector	6.75 (171.5)	6.75 (171.5)	7.61 (193.3)	2.66 (67.5)	5.875 (149.0)	5.875 (149.0)	0.266 (7.0)

Nonmetallic Tubular Sensors

Contents

Nonmetallic Tubular Sensors

Product Description

E55 Tubular Inductive Proximity Sensors by Eaton's Electrical Sector are constructed of corrosion resistant PBT plastic. They are ideally suited for wash down applications such as those found in food processing plants. They are available in 12 mm, 18 mm and 30 mm diameters, shielded or unshielded. Shielded units can be embedded in metallic surfaces.

Features

- Models available that operate on two-wire AC or three-wire DC power
- Threaded tubular housings in three diameters allow easy integration into new and existing applications
- Nonmetallic construction offers excellent resistance to corrosion
- Output indicator LED is standard on all models

Standards and Certifications

- CE
- RoHS Compliant

CE RoHS COMPLIANT

⚠ 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

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

Nonmetallic Tubular Sensors

Two-Wire Sensors ①

	Operating Voltage	Sensing Range (Sn)	Shielding	Connection Type	NO Output Catalog Number	NC Output Catalog Number
12 mm 	**12 mm Diameter**					
	20–250 Vac 50/60 Hz	2 mm	Shielded	2-meter cable	**E55CAL12A2**	**E55CBL12A2**
		4 mm	Unshielded	2-meter cable	**E55CAL12A2E**	**E55CBL12A2E**
18 mm 	**18 mm Diameter**					
	20–250 Vac 50/60 Hz	5 mm	Shielded	2-meter cable	**E55CAL18A2**	**E55CBL18A2**
		8 mm	Unshielded	2-meter cable	**E55CAL18A2E**	**E55CBL18A2E**
30 mm 	**30 mm Diameter**					
	20–250 Vac 50/60 Hz	10 mm	Shielded	2-meter cable	**E55CAL30A2**	**E55CBL30A2**
		15 mm	Unshielded	2-meter cable	**E55CAL30A2E**	**E55CBL30A2E**

Three-Wire Sensors ①

	Operating Voltage	Sensing Range (Sn)	Shielding	Connection Type	NO Output Catalog Number	NC Output Catalog Number
12 mm 	**12 mm Diameter**					
	10–30 Vdc	2 mm	Shielded (NPN)	2-meter cable	**E55CAL12T110**	**E55CBL12T110**
			Shielded (PNP)	2-meter cable	**E55CAL12T111**	**E55CBL12T111**
		4 mm	Unshielded (NPN)	2-meter cable	**E55CAL12T110E**	**E55CBL12T110E**
			Unshielded (PNP)	2-meter cable	**E55CAL12T111E**	**E55CBL12T111E**
18 mm 	**18 mm Diameter**					
	10–30 Vdc	5 mm	Shielded (NPN)	2-meter cable	**E55CAL18T110**	**E55CBL18T110**
			Shielded (PNP)	2-meter cable	**E55CAL18T111**	**E55CBL18T111**
		8 mm	Unshielded (NPN)	2-meter cable	**E55CAL18T110E**	**E55CBL18T110E**
			Unshielded (PNP)	2-meter cable	**E55CAL18T111E**	**E55CBL18T111E**
30 mm 	**30 mm Diameter**					
	10–30 Vdc	10 mm	Shielded (NPN)	2-meter cable	**E55CAL30T110**	**E55CBL30T110**
			Shielded (PNP)	2-meter cable	**E55CAL30T111**	**E55CBL30T111**
		15 mm	Unshielded (NPN)	2-meter cable	**E55CAL30T110E**	**E55CBL30T110E**
			Unshielded (PNP)	2-meter cable	**E55CAL30T111E**	**E55CBL30T111E**

Note

① For a selection of mounting brackets and other accessories for use with these sensors, see **Tab 8**, **section 8.2**.

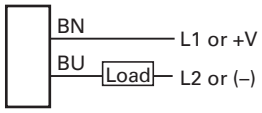
Technical Data and Specifications

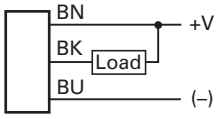
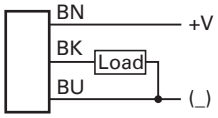
Nonmetallic Tubular Sensors

Description	Two-Wire AC Models	Three-Wire DC Models
Operating voltage	20–250 Vac, 50/60 Hz	10–30 Vdc
Maximum load current	150 mA	200 mA
Switching frequency		
12 mm	25 Hz	2000 Hz (shielded); 1000 Hz (unshielded)
18 mm	25 Hz	1000 Hz (shielded); 500 Hz (unshielded)
30 mm	25 Hz	300 Hz (shielded); 150 Hz (unshielded)
Protection	—	Short circuit and reverse polarity
Temperature range	–13 to 158 °F (–25 to 70 °C)	–13 to 158 °F (–25 to 70 °C)
Enclosure material	Polybutylene Teraphtalate (PBT)	Polybutylene Teraphtalate (PBT)
Enclosure rating	NEMA 3, 3S, 4, 4X, 13 (IP66)	NEMA 3, 3S, 4, 4X, 13 (IP66)
Indicator LED	Lights when output is ON	Lights when output is ON

Wiring Diagrams

Nonmetallic Tubular Sensors

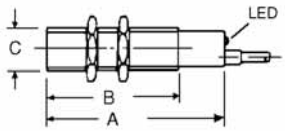
Operating Voltage	Output	Cable Models
Two-Wire Sensors		
20–250 Vac 50/60 Hz	All	

Operating Voltage	Output	Cable Models
Three-Wire Sensors		
10–30 Vdc	NPN	
	PNP	

Dimensions

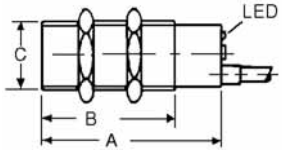
Approximate Dimensions in Inches (mm)

12 and 18 mm



A	B	Thread Size C
12 mm		
2.17 (55)	1.77 (45)	M12 x 1
18 mm		
2.17 (55)	1.77 (45)	M18 x 1

30 mm



A	B	Thread Size C
30 mm		
3.15 (80)	2.36 (60)	M30 x 1.5

E52 Cube Style Sensors

Contents

E52 Cube Style Sensors

Product Description

The E52 Cube Sensor from Eaton's Electrical Sector is a high performance inductive proximity sensor, providing long sensing ranges in a compact, industry-standard package.

The E52 Cube family features Eaton's Autoconfigure output technology, which automatically detects NPN or PNP wiring states and switches the sensor accordingly, without user intervention. The E52 also utilizes complementary outputs to further reduce the number of models needed to cover a wide array of inductive sensing applications. Individual power and output LEDs make installation and troubleshooting easy. Combine the above features with the range and five-way mounting flexibility of the E52 Cube family, and chances are there's an E52 solution to your sensing needs.

The E52 Cube was designed with the most heavy-duty applications in mind. Some of those applications include automotive manufacturing, aggregate machinery, and metalworking applications. Try the E52 Cube in some your most demanding applications today.

Application Description

Typical Applications

- Automotive manufacturing
- Metalworking
- Machinery OEMs
- Pipe and rod manufacturing
- Block and brick manufacturing equipment
- Amusement parks
- Heavy-duty trucks, cranes and lifts

Features

- Long inductive proximity ranges available (up to 40 mm sensing distance)
- Four-wire DC models have complementary outputs (1NO-1NC)
- Four-wire DC models use auto-configure technology, which allows the sensor to automatically adapt for NPN or PNP without user intervention
- Robust design featuring vibration and impact-absorbing potting compound
- Ideal for extreme temperatures or high pressure washdown environments

Standards and Certifications

- UL Listed, E166051
- UL Tested to Canadian safety standards
- CE (DC models only)
- RoHS Compliant

c UL us LISTED CE RoHS COMPLIANT

⚠ 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

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

E52 Cube Style Sensors

3

DC Four-Wire Sensors

Mini-Connector

Micro-Connector

Voltage Type	Output Configuration	Shielding	Output Type	Sensing Range	Connector Style	Catalog Number
Cube Package (40 x 40 x 40 mm)						
10–48 Vdc	NPN/PNP autoconfigure ①	Shielded	1 NO and 1 NC	15 mm	DC 4-pin micro	**E52Q-DL15SAD01** ⠿
					DC 4-pin mini	**E52Q-DL15SAE01** ⠿
		Unshielded	1 NO and 1 NC	15 mm	DC 4-pin micro	**E52Q-DL15UAD01** ⠿
					DC 4-pin mini	**E52Q-DL15UAE01** ⠿
10–48 Vdc	NPN/PNP autoconfigure ①	Shielded	1 NO and 1 NC	20 mm	DC 4-pin micro	**E52Q-DL20SAD01** ⠿
					DC 4-pin mini	**E52Q-DL20SAE01** ⠿
		Unshielded	1 NO and 1 NC	20 mm	DC 4-pin micro	**E52Q-DL20UAD01** ⠿
					DC 4-pin mini	**E52Q-DL20UAE01** ⠿
				25 mm	DC 4-pin micro	**E52Q-DL25UAD01** ⠿
					DC 4-pin mini	**E52Q-DL25UAE01** ⠿
				30 mm	DC 4-pin micro	**E52Q-DL30UAD01** ⠿
					DC 4-pin mini	**E52Q-DL30UAE01** ⠿
				35 mm	DC 4-pin micro	**E52Q-DL35UAD01** ⠿
					DC 4-pin mini	**E52Q-DL35UAE01** ⠿
				40 mm	DC 4-pin micro	**E52Q-DL40UAD01** ⠿
					DC 4-pin mini	**E52Q-DL40UAE01** ⠿

Compatible Connector Cables

Standard Cables ②

Micro-Style Straight Female

Current Rating at 600 V	Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number
Micro-Style, Straight Female							
—	DC	4-pin, 4-wire	22 AWG	6.0 ft (2m)	 1-Brown 2-White 3-Blue 4-Black	**CSDS4A4CY2202**	**CSDS4A4RY2202**
				16.4 ft (5m)		**CSDS4A4CY2205**	**CSDS4A4RY2205**
				32.8 ft (10m)		**CSDS4A4CY2210**	**CSDS4A4RY2210**

Mini-Style Straight Female

Current Rating at 600 V	Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number
Mini-Style, Straight Female							
10 A	AC/DC	4-pin, 4-wire	16 AWG	6.0 ft (2m)	 1-Black 2-Blue 3-Brown 4-White	**CSMS4A4CY1602**	—
				13.1 ft (4m)		**CSMS4A4CY1604**	—
				19.7 ft (6m)		**CSMS4A4CY1606**	—

Notes

⠿ See listing of compatible connector cables above.

① Autoconfigure technology allows the sensor to automatically adapt to NPN or PNP without user intervention.

② For a full selection of connector cables, see **Tab 10**, **section 10.1**.

Technical Data and Specifications

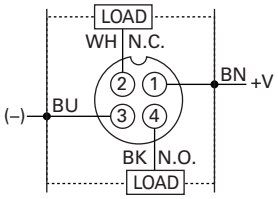
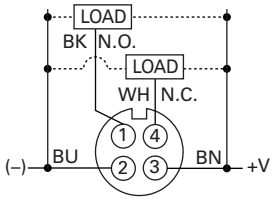
E52 Cube Style Sensors

Description	DC Four-Wire
Operating voltage	10–48 Vdc
Load current (maximum)	300 mA
Burden current	<25 mA
Off-state leakage	<150 µA per output
Voltage drop	<2.5 V
Outputs	1 NO/1 NC (complementary)
Standard target size (mild steel)	120 mm
Frequency of operation	100 Hz
Repeatability	<3%
Hysteresis (maximum)	10–15%
Time delay before availability	300 ms
Circuit protection	Short-circuit protection with auto reset
Operating temperature ①	–25 to 158 °F (–25 to 70 °C)
Temperature drift	±10%
Enclosure rating	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67, IP68)
Indicator LEDs	Green: power; Red: output status
Material of construction	Zinc alloy housing, PPS, PC

Wiring Diagrams

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

E52 Cube Style Sensors

Voltage Type	Micro-Connector	Mini-Connector
DC four-wire	 *AutoConfigure enables load to be wired to +V or (–)*	 *AutoConfigure enables load to be wired to +V or (–)*

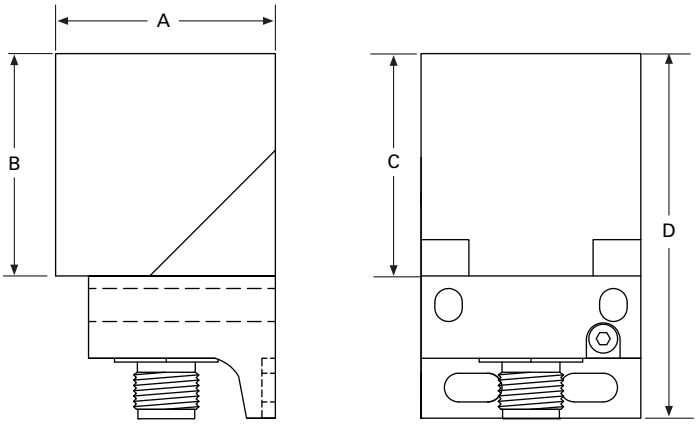
Note

① Will operate at –40 °F (–40 °C), but range drift will occur.

Dimensions

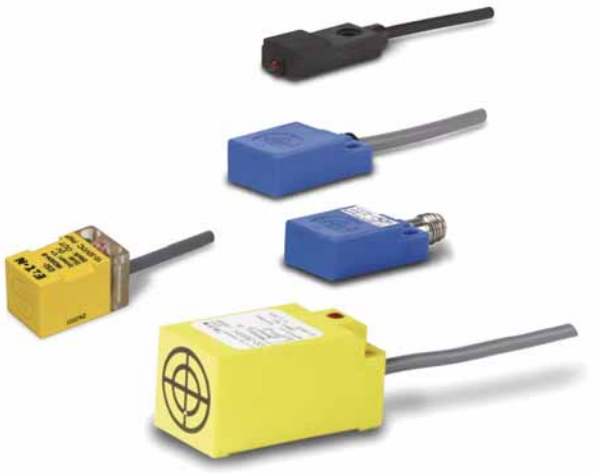
Approximate Dimensions in Inches (mm)

E52 Cube Style Sensors



Model	Width A	Depth B	Height C	Overall Height D
Micro-connector	1.57 (40)	1.57 (40)	1.57 (40)	2.725 (69.2)
Mini-connector	1.57 (40)	1.57 (40)	1.57 (40)	2.965 (75.3)

E52 Rectangular Style Sensors



Contents

E52 Rectangular Style Sensors

Product Description

Rectangular E52 Inductive Proximity Sensors from Eaton's Electrical Sector feature a small, thin, compact space-saving design for applications where tubular type sensors cannot be used. Sensors are self-contained for direct connection to a logic circuit, relay, counter, programmable controller, and so on.

Features

- Small, low-profile design for use in space restrictive applications
- Three-wire DC operation
- Choose from a variety of sizes, and side or end sensing configurations
- Output indicator included on all models
- Epoxy filled cavities stop fluids from contacting any electrical component
- Convenient mounting holes integrated into each sensor housing

Standards and Certifications

- CE (except E52RAL)
- RoHS Compliant

CE RoHS COMPLIANT

⚠ 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

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

E52 Rectangular Style Sensors

Three-Wire Models

	Voltage	Sensing Range	Frequency	Shielding	Connection Type	NO Output Catalog Number	NC Output Catalog Number
R12 Side Sensing	**R12 Side Sensing**						
	12–24 Vdc	0.12 in (3 mm)	Standard	Shielded (NPN)	1-meter cable	**E52RAL12T110**	—
				Shielded (PNP)		**E52RAL12T111**	—
			Alternate	Shielded (NPN)	1-meter cable	**E52RAL12T110AF**	—
				Shielded (PNP)		**E52RAL12T111AF**	—
Q16 End Sensing	**Q16 End Sensing**						
	12–30 Vdc	0.20 in (5 mm)	Standard	Unshielded (NPN)	2-meter cable	**E52-16QS04-C**	**E52-16QS04-C1**
				Unshielded (PNP)	2-meter cable	**E52-16QS04-B**	**E52-16QS04-B1**
R18 Side Sensing	**R18 Side Sensing**						
	10–30 Vdc	0.16 in (4 mm)	Standard	Unshielded (NPN)	2-meter cable	**E52-18RU04-C**	**E52-18RU04-C1**
					3-pin nano-connector	**E52-18RU04-CN** ⓝ	**E52-18RU04-C1N** ⓝ
				Unshielded (PNP)	2-meter cable	**E52-18RU04-B**	**E52-18RU04-B1**
					3-pin nano-connector	**E52-18RU04-BN** ⓝ	**E52-18RU04-B1N** ⓝ
Q25 End Sensing	**Q25 End Sensing**						
	10–30 Vdc	0.39 in (10 mm)	Standard	Shielded (NPN)	2-meter cable	**E52-25QS10-C**	**E52-25QS10-C1**
				Shielded (PNP)	2-meter cable	**E52-25QS10-B**	**E52-25QS10-B1**

Compatible Connector Cables

Standard Cables ①

	Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number
Nano-Style Straight Female	**Nano-Style, Straight Female**						
	DC	3-pin	24 AWG	6.0 ft (2m)	 1-Brown 3-Blue 4-Black	**CSNS3A3CY2402**	**CSNS3A3RY2402**

Technical Data and Specifications

E52 Rectangular Style Sensors

Description	Specification
Input current	Less than 10 mA
Load current	100 mA maximum
Switching rate	500 operations per second
Circuit protection	Short circuit
Ambient temperature range	–13 to 130 °F (–10 to 55 °C)
Enclosure rating	NEMA 1, 2, 3, 3S, 4, 12 (IEC IP66)
Enclosure material	PBT composition
Output indicator LED	Lights when output is ON

Notes

ⓝ See listing of compatible connector cables above.

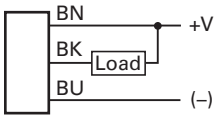
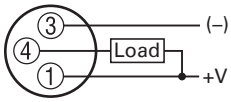
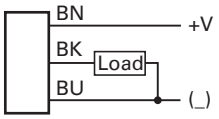
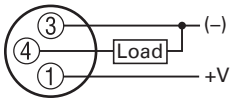
① For a full selection of connector cables, see **Tab 10**, **section 10.1**.

3

Wiring Diagrams

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

E52 Rectangular Style Sensors

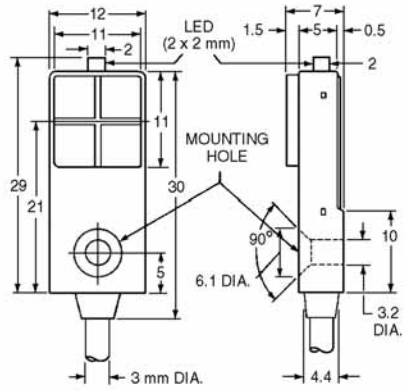
Operating Voltage	Output	Cable Models	Nano-Connector Models (Face View Male Shown)
Three-Wire Sensors			
DC	NPN		
	PNP		

Dimensions

Approximate Dimensions in Inches (mm) except where noted

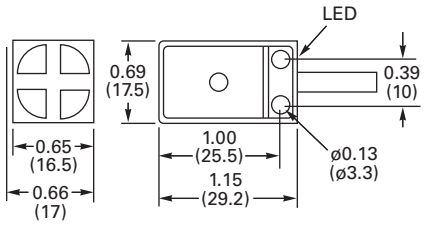
E52 Rectangular Style Sensors

R12

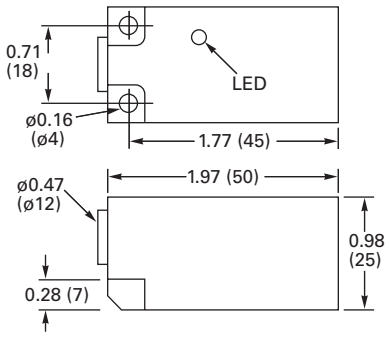


Note: Dimensions are mm only.

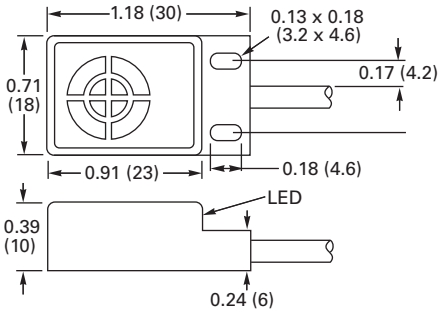
Q16

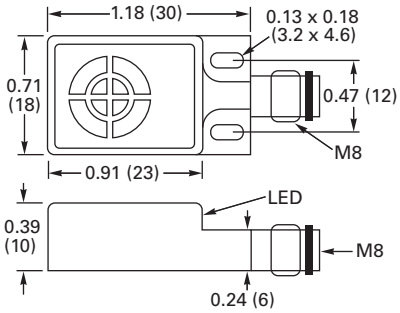


Q25



R18





E55 Limit Switch Style Sensors with Nonmetallic Housings

Contents

E55 Limit Switch Style Sensors with Nonmetallic Housings

Product Description

These sensors from Eaton's Electrical Sector feature PBT resin housings for high resistance to corrosion. The housing is sized to offer a direct replacement for standard limit switches. The unique sensing head is factory assembled for top sensing, but can be easily converted in the field to any one of four side sensing positions. Models are available with sensing ranges from 15 mm to 40 mm. The sensors can be wired for NO or NC operation.

Features

- Nonmetallic housing offers excellent resistance to corrosion
- Same form factor and mounting as standard limit switches for easy retrofit
- Sensor head features five sensing positions (top and all four sides) that can be easily changed in the field
- Long sensing ranges up to 40 mm

Standards and Certifications

- CE
- RoHS Compliant

CE RoHS COMPLIANT

⚠ 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.

Product Selection

E55 Limit Switch Style Sensors

E55 Limit Switch

Two-Wire Sensors

Voltage Type	Sensing Range (Sn)	Shielding	Output	Connection Type	Catalog Number
35–250 Vac	15 mm	Shielded	NO or NC	Terminal wiring	**E55BLT1C**
	20 mm	Unshielded			**E55BLT1D**
	30 mm				**E55BLT1E**
	40 mm				**E55BLT1F**

For the most current information on this product, visit our Web site: 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.

Technical Data and Specifications

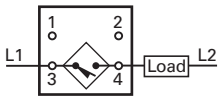
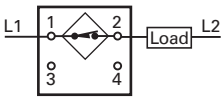
E55 Limit Switch Style Sensors

Description	Specification
Operating voltage	35–250 Vac
Maximum load current	400 mA
Switching frequency	25 Hz maximum
Leakage current	1.8 mA
Voltage drop	8V maximum
Inrush	5 A maximum for 20 ms
Indicator LEDs	Two LEDs: One lights when power is ON, the other lights when output is ON
Operating temperature	–13 to 158 °F (–25 to 70 °C)
Enclosure ratings	NEMA 4, 4X, 6, 12, 13 (IP67)
Housing material	PBT resin

Wiring Diagrams

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

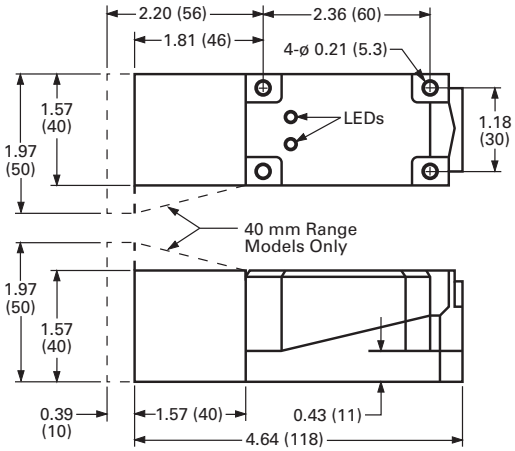
E55 Limit Switch Style Sensors

Operating Voltage	Output	Terminal Models
Two-Wire Sensors		
35–250 Vac ①	NO	
	NC	

Dimensions

Approximate Dimensions in Inches (mm)

E55 Limit Switch Style Sensors



Note

① Switches are shipped as NO configuration. Internal jumpers must be moved to program for NC.

3

E51 Modular Limit Switch Style Sensors

Contents

E51 Modular Limit Switch Style Sensors

Product Description

The E51 Inductive Proximity Sensor family from Eaton's Electrical Sector combines high performance with a familiar limit switch style housing. Modular, plug-in components provide application flexibility, ease of maintenance, less downtime and reduced inventory. Choose from two-wire sensors with AC/DC operation, or four-wire sensors in either AC or DC styles. Connection options include terminal, mini-connector or various lengths of cable.

Choose from standard sensors that detect all types of metallic targets. The next page provides more detail on these sensors.

Features

- Rugged construction is ideal for industrial environments
- Viton gaskets ensure a positive seal and high resistance to industry chemicals
- Direct replacement for worn out limit switches
- Sensor heads and bodies feature captive screws to eliminate loss
- All sensor heads include a selector switch to program output function to either NO or NC
- Sensor bodies feature bifurcated engagement prongs for a reliable connection when plugging into receptacle stabs
- Engagement key between sensor body and receptacle prevents improper assembly
- Sensors accommodate both U.S. and DIN mounting dimensions
- Wiring terminals feature captive pressure plate saddles for #18 to #12 AWG wire. A green screw identified ground terminal is also included
- Logic modules are available to provide additional control functions

Standards and Certifications

- UL Listed, E166051, E183975
- CSA Certified, 50513
- RoHS Compliant

LISTED

RoHS COMPLIANT

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

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

Standard Sensors—Assembled with Terminal Wiring

Standard E51 sensors feature long sensing ranges and a choice of top or side sensing heads. Alternate frequency units eliminate interference when mounted close to standard frequency units. Order sensors in component form, as assembled plug-in units, or in a sealed version where the sensor body is factory assembled to an epoxy filled receptacle with tamper-proof screws to ensure a lasting seal.

Assembled Sensor

Assembled Sensors—Standard (with Terminal Wiring)

Sensor Body and Receptacle

	Two-Wire Sensors	Four-Wire Sensors			
Operating voltage	20–264 Vac/dc	120 Vac		10–30 Vdc	
Output	NO or NC ①	NO and NC complementary		NO and NC complementary	
Sensor body	**E51SAL**	**E51SCL**	**E51SCN** Accepts logic modules ②	**E51SPL** PNP	**E51SNL** NPN
Receptacle ③	**E51RA**	**E51RC**	**E51RCB**	**E51RN**	**E51RN**

Sensor Heads ①

Top Sensing

Side Sensing

Sensing Range	Shielding	Frequency	Sensor Head Only Catalog Number	Assembled Sensors with Head, Sensor Body and Receptacle Catalog Number				
Top Sensing								
0.51 in (13 mm)	Shielded	Standard	**E51DT1**	**E51ALT1**	**E51CLT1**	**E51CNT1**	**E51PLT1**	**E51NLT1**
		Alternate	**E51DT2**	**E51ALT2**	**E51CLT2**	**E51CNT2**	**E51PLT2**	**E51NLT2**
0.94 in (24 mm)	Unshielded	Standard	**E51DT5**	**E51ALT5**	**E51CLT5**	**E51CNT5**	**E51PLT5**	**E51NLT5**
		Alternate	**E51DT6**	**E51ALT6**	**E51CLT6**	**E51CNT6**	**E51PLT6**	**E51NLT6**
Side Sensing								
0.51 in (13 mm)	Shielded	Standard	**E51DS1**	**E51ALS1**	**E51CLS1**	**E51CNS1**	**E51PLS1**	**E51NLS1**
		Alternate	**E51DS2**	**E51ALS2**	**E51CLS2**	**E51CNS2**	**E51PLS2**	**E51NLS2**
0.94 in (24 mm)	Unshielded	Standard	**E51DS5**	**E51ALS5**	**E51CLS5**	**E51CNS5**	**E51PLS5**	**E51NLS5**
		Alternate	**E51DS6**	**E51ALS6**	**E51CLS6**	**E51CNS6**	**E51PLS6**	**E51NLS6**

Notes

① All sensor heads feature a programmable output selector switch for NO or NC operation. Operation is as follows:

For This Output Type:	Set Selector Position: "TARGET"	"NO TARGET"
NO	Target present	Target absent
NC	Target absent	Target present

② Logic module must be ordered separately, see **Page V8-T3-91**. These sensor bodies are rated NEMA 4, 4X and 13.

③ Receptacles feature terminal wiring with a 1/2 in NPT thread at the conduit entrance. Other connection options are available:

Connection Option		Catalog Number	Code Suffix	Example
20 mm thread at the conduit entrance		—	**20**	**E51ALT120**
Mini-connector termination with epoxy filled receptacle, see **Page V8-T3-92** for additional receptacle options	Two-wire, 3-pin connector	**CSMS3F3CY1602**	**P3**	**E51ALT1P3**
	Four-wire, 5-pin connector	**CSMS5D5CY1602**	**P5**	**E51CLT1P5**
Pre-wired cable with epoxy filled receptacle	8 ft long	—	**S**	**E51ALT1S**
	12 ft long	—	**S12**	**E51ALT1S12**
	20 ft long	—	**S20**	**E51ALT1S20**

Standard Sensors—Assembled with Receptacles

Sensor body is attached to receptacle with tamper-proof screws.

Assembled Sensor

Assembled Sensors—Standard (with Epoxy Filled Receptacles and Pre-wired Cables)

Sensor Base Type with 8 ft Cable ②

		Two-Wire Sensors	Four-Wire Sensors		
	Operating voltage	20–264 Vac/dc	120 Vac	10–30 Vdc	
				NO and NC complementary	
	Output	NO or NC ①	NO and NC complementary	PNP	NPN

Sensor Heads ①	Sensing Range	Shielding	Frequency	Sensor Head Only Catalog Number	Assembled Sensors with Head and Sensor Base Catalog Number			
Top Sensing	**Top Sensing**							
	0.51 in (13 mm)	Shielded	Standard	**E51DT1**	**E51ALT16P**	**E51CLT16P**	**E51PLT16P**	**E51NLT16P**
			Alternate	**E51DT2**	**E51ALT26P**	**E51CLT26P**	**E51PLT26P**	**E51NLT26P**
	0.94 in (24 mm)	Unshielded	Standard	**E51DT5**	**E51ALT56P**	**E51CLT56P**	**E51PLT56P**	**E51NLT56P**
			Alternate	**E51DT6**	**E51ALT66P**	**E51CLT66P**	**E51PLT66P**	**E51NLT66P**
Side Sensing	**Side Sensing**							
	0.51 in (13 mm)	Shielded	Standard	**E51DS1**	**E51ALS16P**	**E51CLS16P**	**E51PLS16P**	**E51NLS16P**
			Alternate	**E51DS2**	**E51ALS26P**	**E51CLS26P**	**E51PLS26P**	**E51NLS26P**
	0.94 in (24 mm)	Unshielded	Standard	**E51DS5**	**E51ALS56P**	**E51CLS56P**	**E51PLS56P**	**E51NLS56P**
			Alternate	**E51DS6**	**E51ALS66P**	**E51CLS66P**	**E51PLS66P**	**E51NLS66P**

Sensor Heads

Sensor Heads ①

	Sensing Range	Shielding	Frequency	Target Material	Catalog Number
Top Sensing	**Top Sensing**				
	0.51 in (13 mm)	Shielded	Standard	All metals	**E51DT1**
			Alternate		**E51DT2**
	0.94 in (24 mm)	Unshielded	Standard	All metals	**E51DT5**
			Alternate		**E51DT6**
Side Sensing	**Side Sensing**				
	0.51 in (13 mm)	Shielded	Standard	All metals	**E51DS1**
			Alternate		**E51DS2**
	0.94 in (24 mm)	Unshielded	Standard	All metals	**E51DS5**
			Alternate		**E51DS6**

Notes

① All sensor heads feature a programmable output selector switch for NO or NC operation. Operation is as follows:

For This Output Type:	Set Selector Position: "TARGET"	"NO TARGET"
NO	Target present	Target absent
NC	Target absent	Target present

② Switch bases feature 8 ft of SOOW-A cable. Other connection options are available:

Connection Option ③	Suffix	Example
Mini-connector mounted on 3 ft (0.9m) pigtail cable	**T**	**E51ALT16PT**
Mini-connector mounted to switch base	**C**	**E51ALT16PC**
Cable longer than 8 feet, add required length in 1 ft increments to listed catalog number—20 ft maximum	**Length in ft**	**E51ALT16P12 for 12 ft**

③ See listing of compatible connector cables on **Page V8-T3-93**.

Sensor Bodies

Two-Wire Sensors

	Operating Voltage	Output	Protection	Output Rating Continuous	Type	Catalog Number
AC/DC	**AC/DC**					
	20–264 Vac/dc, 50/60 Hz	1 output, load powered, NO or NC, programmable from head; off state leakage current: <1.7 mA at 120 Vac/dc, <2.0 mA at 240 Vac	Latching short circuit and overload	0.5 A	—	**E51SAL** ①

Four-Wire Sensors

	Operating Voltage	Output	Protection	Output Rating Continuous	Type	Catalog Number
AC (E51SCN Shown)	**AC**					
	120 Vac, 50/60 Hz	2 complementary outputs, line powered, NO and NC	—	1.0 A to 158 °F (70 °C), linearly derated to 0.6 A at 176 °F (80 °C)	—	**E51SCL** ①
				1.0 A to 113 °F (45 °C), linearly derated to 0.3 A at 176 °F (80 °C)	—	**E51SCN** ②③
DC	**DC**					
	10–30 Vdc	2 complementary outputs, line powered, NO and NC	Reverse polarity	0.6 A to 104 °F (40 °C), linearly derated to 0.36A at 176 °F (80 °C)	NPN	**E51SNL** ①
					PNP	**E51SPL** ①

Logic Module

Logic Module (for E51SCN Sensor Body Only)

	Type	Description	Timing Range ④	Catalog Number
Logic Module ⑤	ON and OFF delay	Adjustable delay between time object is sensed and time switch function occurs Adjustable delay between time object leaves sensing field and time switch transfers back to non-sensing state	0.15 to 15.0 seconds	**E51MTB**
				

Notes

① This sensor body is available in a factory-sealed, non plug-in configuration (with 8-ft cable), add **6P** to listed catalog number. Example: E51SAL**6P**.
② Sensor body is black. E51SCN sensor bodies are rated NEMA 4, 4X and 13.
③ This sensor accepts logic modules, as seen in chart above.
④ Repeatability of the timing cycle is ±1% at constant voltage, ambient temperature and reset time.
⑤ Reset time is 25 ms minimum. Rated NEMA 4, 4X and 13.

Receptacles

Receptacles

	Description	Style	Details	Cable Length	Conduit Entrance 1/2 in NPT Catalog Number	Conduit Entrance 20 mm Catalog Number
Surface Mount	**Surface Mount**					
	Conduit entrance, front or rear mounting	Two-wire, AC/DC	—	—	**E51RA**	**E51RA20**
		Four-wire, AC	Gray	—	**E51RC**	**E51RC20**
			Black ①	—	**E51RCB**	**E51RCB20**
		Four-wire, DC	—	—	**E51RN**	**E51RN20**
Mini-Connector	**Mini-Connector**					
	Epoxy filled receptacle with pre-wired mini-connector	Two-wire, AC/DC	3-pin	—	**E51RAP3** ⓐ	—
		Four-wire, AC	5-pin	—	**E51RCP5** ⓑ	—
		Four-wire, DC	5-pin	—	**E51RNP5** ⓑ	—
Pigtail with Mini-Connector	**Pigtail with Mini-Connector**					
	Epoxy filled receptacle with mini-connector mounted on 3 ft (0.9m) cable	Two-wire, AC/DC	3-pin	3 ft (0.9m)	**E51RAPT3** ⓐ	—
		Four-wire, AC	5-pin	3 ft (0.9m)	**E51RCPT5** ⓑ	—
		Four-wire, DC	5-pin	3 ft (0.9m)	**E51RNPT5** ⓑ	—
Pre-Wired Cable	**Pre-Wired Cable**					
	Epoxy filled receptacle with pre-wired 16 gauge, yellow jacketed, type SOOW-A cable. Cable enters through hole threaded for conduit	Two-wire, AC/DC	3-conductor	8 ft (2.4m)	**E51RAS**	**E51RA20S**
				12 ft (3.6m)	**E51RAS12**	—
				20 ft (6m)	**E51RAS20**	—
		Four-wire, AC	5-conductor	8 ft (2.4m)	**E51RCS**	**E51RC20S**
				12 ft (3.6m)	**E51RCS12**	—
				20 ft (6m)	**E51RCS20**	—
		Four-wire, DC	5-conductor	8 ft (2.4m)	**E51RNS**	**E51RN20S**
				12 ft (3.6m)	**E51RNS12**	—
				20 ft (6m)	**E51RNS20**	—

Notes

ⓐⓑ See listing of compatible connector cables on **Page V8-T3-93**.

① Black receptacle is for color compatibility with E51SCN sensor body.

Compatible Connector Cables

Standard Cables ①

	Current Rating at 600 V	Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	Catalog Number
Micro-Style Straight Female 	**Micro-Style, Straight Female**						
	13 A	—	3-pin	16 AWG	6 ft (2m)	 1-Green 2-Black 3-White	**CSMS3F3CY1602**
	10 A	AC/DC	4-pin, four-wire	16 AWG	6 ft (2m)	 1-Black 2-Blue 3-Brown 4-White	**CSMS4A4CY1602**
	8 A	—	5-pin	16 AWG	6 ft (2m)	 1-White 2-Red 3-Green 4-Orange 5-Black	**CSMS5D5CY1602**

Accessories

E51 Modular Limit Switch Style Sensors

	Description	Catalog Number
One Hole 	**Universal Mounting Bracket**	
	One hole, includes mounting hardware, stainless steel	**E51KH2**
Two Holes 	Two holes, includes mounting hardware, steel	**E51KH4**
Machine Mounting Bracket 	**Machine Mounting Bracket**	
	Zinc die cast construction	**E50KH3**
Stand-Off Mounting Bracket 	**Stand-Off Mounting Bracket**	
	Steel construction	**E51KH3**
Remote Sensor Head Assembly 	**Remote Sensor Head Assembly**	
	Permits mounting sensor head up to 3 ft (0.9m) from sensor body	**E51KRM**

Dimensions, see **Page V8-T3-95**.

Note

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

Technical Data and Specifications

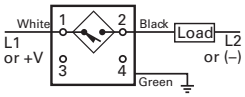
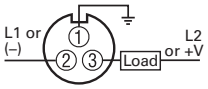
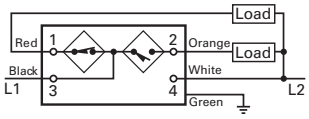
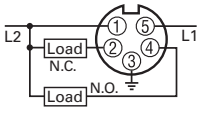
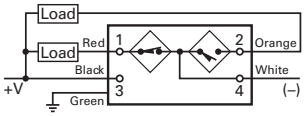
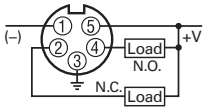
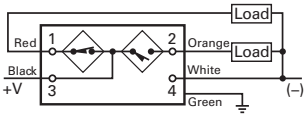
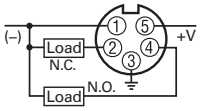
E51 Modular Limit Switch Style Sensors

Description	Specification
Output rating (NEMA D150)	
AC/DC models	0.5 A continuous
AC models	1 A continuous
DC models	0.6 A continuous
Protection	Latching short-circuit protection on two-wire AC/DC models; DC models: resettable short-circuit protection
Switching rate	AC models: 15 Hz; DC models: 50 Hz
Indicator LEDs	Lights when output is ON. One LED for each output
Alternate frequency	Standard and alternate frequencies allow side-by-side operation without interference
Enclosure material	Zinc die cast
Gasket material	Viton
Enclosure ratings	NEMA 3, 3S, 4, 4X, 6, 6P, 12 and 13 (IP67); E51SCN sensor body only: NEMA 4, 4X and 13
Hazardous locations ratings	
Class I	Division II—GRPS ABCD
Class II	Division II—GRPS F and G
Class III	Division 2
Temperature range	–13 to 158 °F (–25 to 70 °C)
Torque requirements	Switch body screws: 25–30 in-lbs; sensing head screws: 14–18 in-lbs
Vibration	10–55 Hz, 1 mm amplitude
Shock	30 g, 11 ms, 1/2 sine wave
Humidity	95% non-condensing
Burden current	<25 mA
OFF-state leakage	DC version: 120 µA; two-wire AC: 1.9 mA maximum; three-wire AC: 1.1 mA
ON-state leakage	<2.5 Vdc
Power-up delay	<150 ms

Wiring Diagrams

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

E51 Modular Limit Switch Style Sensors

Operating Voltage	Output	Terminal and Cable Models	Mini-Connector Models (Face View Male Shown)
Two-Wire Sensors			
20–264 Vac or Vdc 50/60 Hz	NO or NC (NO shown, can be changed to NC using switch on sensor head)		
Four-Wire Sensors			
120 Vac 50/60 Hz	NO and NC ①		
10–30 Vdc	NO and NC NPN ①		
	NO and NC PNP ①		

Note

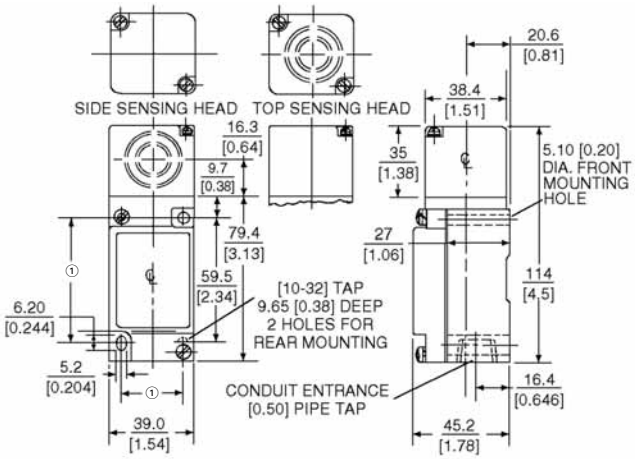
① Changing output switch on sensor head will reverse output function (NO becomes NC, and NC becomes NO).

Dimensions

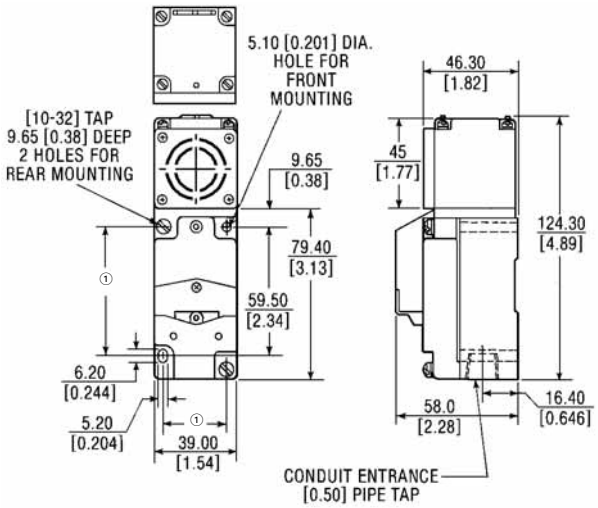
Approximate Dimensions in mm [in]

E51 Modular Limit Switch Style Sensors

Standard Sensors



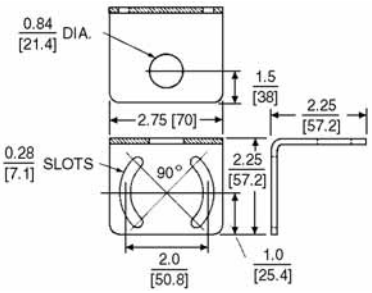
Sensor with Logic Module



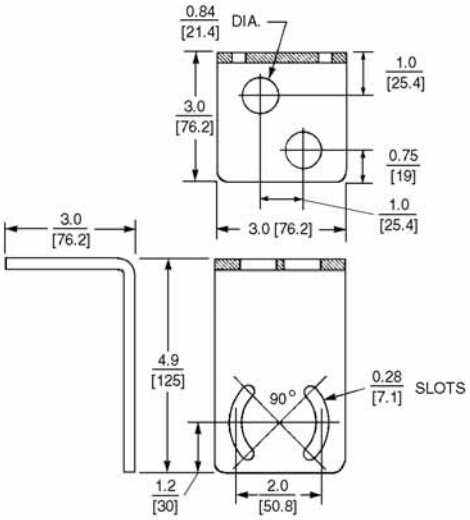
Accessories

Approximate Dimensions in Inches [mm]

Universal Mounting Bracket—One Hole



Universal Mounting Bracket—Two Holes



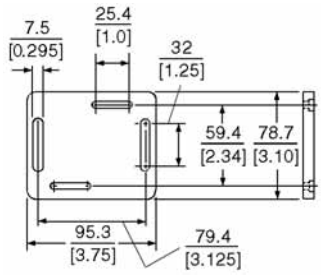
Note

① Can accommodate both U.S., 29.4 [1.16] x 59.5 [2.34] and DIN, 30 [1.18] x 60 [2.36], mounting dimensions are in mm [in].

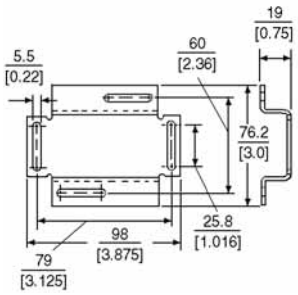
3

Approximate Dimensions in mm [in]

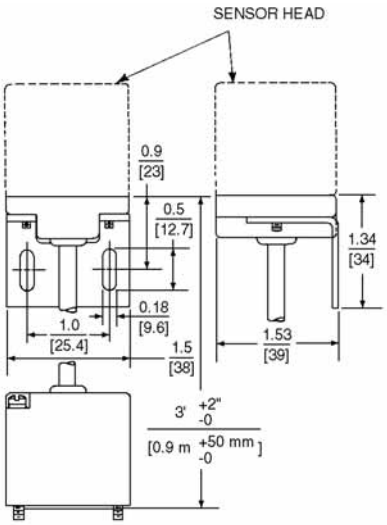
Machine Mounting Bracket



Stand-Off Mounting Bracket



Remote Sensor Head Assembly



E51 Limit Switch Style, Factory Sealed 6P+ Sensors

Contents

E51 Limit Switch Style, Factory Sealed 6P+ Sensors

Product Description

E51 6P+ Inductive Proximity Sensors from Eaton's Electrical Sector are fully sealed, pre-wired and designed specifically to ensure reliability under the most adverse of environmental conditions. They have been proven to withstand the penetrating properties of dirt, dust, grit, extreme temperatures and humidity. The unitized design eliminates plug-in connections that can lead to reliability problems in rugged environments.

Features

- The one-piece body and sensing head are both epoxy filled to protect internal components from contamination
- The head is hard-wired to the sensor body to ensure trouble-free performance
- Choose from top and side sensing heads
- Side sensing heads can be rotated to any of four positions
- Mounting dimensions allow direct replacement of worn out limit switches
- Rugged zinc die cast construction withstands physical abuse
- Connection options include pre-wired cable, body mounted connector and pigtail connector

Standards and Certifications

- UL Listed, E166051
- CSA Certified, 50513
- RoHS Compliant

c UL us LISTED

RoHS COMPLIANT

⚠ 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

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

Unitized Sensors

3

Assembled Sensor with 8 ft Cable ①

Sensor Heads ②

Top Sensing ②

Side Sensing ②

Factory Sealed 6P+ Assembled Sensors

			Two-Wire Sensors		Four-Wire Sensors		
		Operating voltage	20–264 Vac/dc		120 Vac	10–30 Vdc	
		Output	NO	NC	NO and NC complementary	NO and NC complementary PNP	NPN
Sensing Range	**Shielding**	**Frequency** ③	**Assembled Sensor with Head, Sensor Body and Receptacle Catalog Number**				
Top Sensing							
0.51 in (13 mm)	Shielded	Standard	**E51ALT16PU**	**E51BLT16PU**	**E51CLT16PU**	**E51PLT16PU**	**E51NLT16PU**
		Alternate	**E51ALT26PU**	**E51BLT26PU**	**E51CLT26PU**	**E51PLT26PU**	**E51NLT26PU**
0.94 in (24 mm)	Unshielded	Standard	**E51ALT56PU**	**E51BLT56PU**	**E51CLT56PU**	**E51PLT56PU**	**E51NLT56PU**
		Alternate	**E51ALT66PU**	**E51BLT66PU**	**E51CLT66PU**	**E51PLT66PU**	**E51NLT66PU**
Side Sensing							
0.51 in (13 mm)	Shielded	Standard	**E51ALS16PU**	**E51BLS16PU**	**E51CLS16PU**	**E51PLS16PU**	**E51NLS16PU**
		Alternate	**E51ALS26PU**	**E51BLS26PU**	**E51CLS26PU**	**E51PLS26PU**	**E51NLS26PU**
0.94 in (24 mm)	Unshielded	Standard	**E51ALS56PU**	**E51BLS56PU**	**E51CLS56PU**	**E51PLS56PU**	**E51NLS56PU**
		Alternate	**E51ALS66PU**	**E51BLS66PU**	**E51CLS66PU**	**E51PLS66PU**	**E51NLS66PU**

Compatible Connector Cables

Mini-Style Straight Female

Standard Cables ⑥

Current Rating at 600 V	Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	Catalog Number
Mini-Style, Straight Female						
13 A	—	3-pin	16 AWG	6 ft (2m)	 1-Green 2-Black 3-White	**CSMS3F3CY1602**
10 A	—	4-pin	16 AWG	6 ft (2m)	 1-Black 2-Blue 3-Brown 4-White	**CSMS4A4CY1602**
8 A	AC/DC	5-pin, 5-wire	16 AWG	6 ft (2m)	 1-Black 2-Blue 3-Orange 4-Brown 5-White	**CSMS5A5CY1602**

Notes

① Switch bases feature 8 ft of SOOW-A cable. Other connection options are available:

Connection Option ④	Instructions	Example
Mini-connector mounted on 3 ft (0.9m) pigtail cable (3-pin for two-wire sensors; 5-pin for four-wire sensors)	Add the letter **T** before **U**	**E51ALT16PTU**
Mini-connector mounted to switch base (3-pin for two-wire sensors; 5-pin for four-wire sensors)	Add the letter **C** before **U**	**E51ALT16PCU**
Cable longer than 8 ft, add required length in 1 ft increments to listed catalog number—20 ft maximum	Add length in feet to end of catalog number	**E51ALT16PU12** ⑤

② Sensor head is hard wired to sensor body and cannot be detached. Side sensing head can be unfastened and rotated to any of four positions.

③ Sensor heads feature color coded target symbols: Yellow for standard frequency; Green for alternate frequency.

④ See listing of compatible connector cables above.

⑤ For 12 ft.

⑥ For a full selection of connector cables, see **Tab 10**, **section 10.1**.

Accessories

E51 Limit Switch Style, Factory Sealed 6P+ ①

	Description	Catalog Number
One Hole 	**Universal Mounting Bracket**	
	Includes mounting hardware, stainless steel	**E51KH2**
Two Holes 	Includes mounting hardware, steel	**E51KH4**
Machine Mounting Bracket 	**Machine Mounting Bracket**	
	Zinc die cast construction	**E50KH3**
Stand-Off Mounting Bracket 	**Stand-Off Mounting Bracket**	
	Steel construction	**E51KH3**
	Dimensions, see **Page V8-T3-100**.	

Technical Data and Specifications

E51 Limit Switch Style, Factory Sealed 6P+

Description	Specification
Output rating (NEMA D150)	
AC/DC models	0.5 A continuous
AC models	1 A continuous
DC models	0.6 A continuous
Protection	Latching short-circuit protection on two-wire AC/DC and three-wire DC models
Switching rate	AC models: 15 Hz; DC models: 50 Hz
Indicator LEDs	Lights when output is ON. One LED for each output
Alternate frequency	Standard and alternate frequencies allow side-by-side operation without interference
Enclosure material	Cast metal
Gasket material	Zinc die cast
Enclosure ratings	NEMA 3, 3S, 4, 4X, 6, 6P, 12 and 13 (IP68)
Temperature range	–13 to 158 °F (–25 to 70 °C)
Torque requirements	Switch body screws: 25–30 in-lbs; sensing head screws: 14–18 in-lbs
OFF-state leakage	DC version: 120 µA; two-wire AC: 1.9 mA maximum; three-wire AC: 1.1 mA
ON-state leakage	<2.5 Vdc

Note

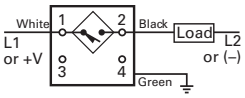
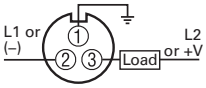
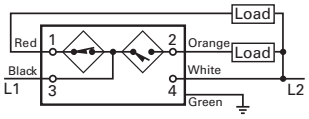
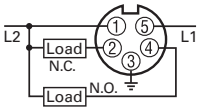
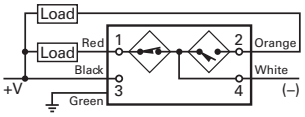
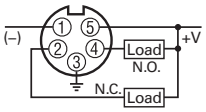
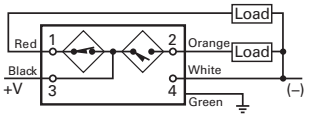
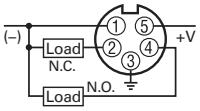
① For a full selection of connector cables, see **Tab 10**, **section 10.1**.

Wiring Diagrams

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

E51 Limit Switch Style, Factory Sealed 6P+

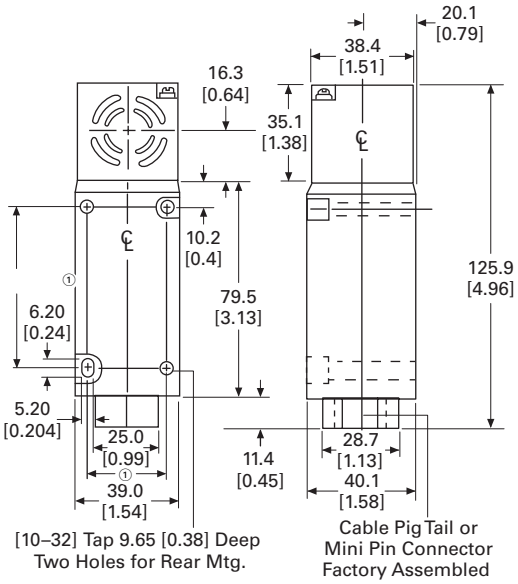
3

Operating Voltage	Output	Cable Models	Mini-Connector Models (Face View Male Shown)
Two-Wire Sensors			
20–264 Vac or Vdc 50/60 Hz	NO or NC (NO shown)		
Four-Wire Sensors			
120 Vac 50/60 Hz	NO and NC		
10–30 Vdc	NO and NC NPN		
	NO and NC PNP		

Dimensions

Approximate Dimensions in mm [in]

E51 Limit Switch Style, Factory Sealed 6P+



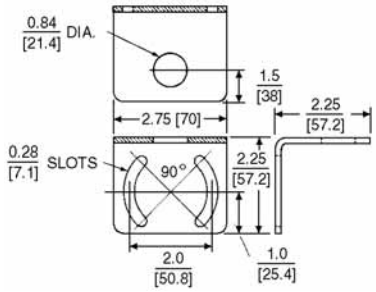
Note

① Can accommodate both U.S., 29.4 [1.16] x 59.5 [2.34] and DIN, 30 [1.18] x 60 [2.36], mounting dimensions.

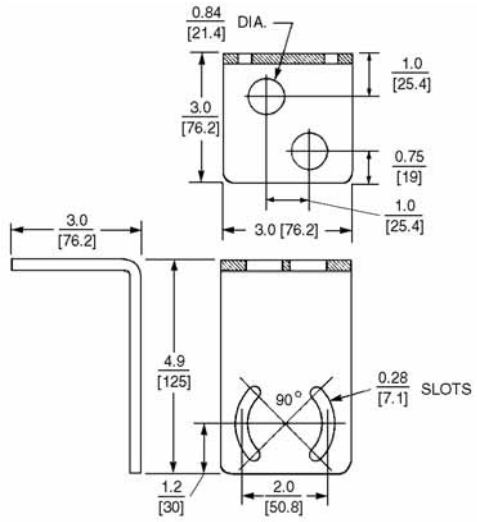
Approximate Dimensions in Inches [mm]

Accessories

Universal Mounting Bracket—One Hole

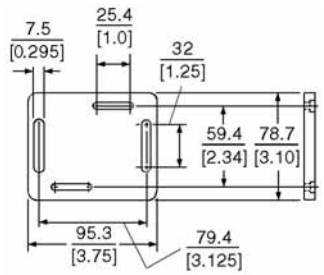


Universal Mounting Bracket—Two Holes

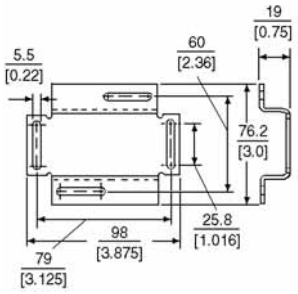


Approximate Dimensions in mm [in]

Machine Mounting Bracket



Stand-Off Mounting Bracket



Note

① Can accommodate both U.S., 29.4 [1.16] x 59.5 [2.34] and DIN, 30 [1.18] x 60 [2.36], mounting dimensions.

iProx

E57P Performance

AccuProx

E56 Pancake

Nonmetallic Tubular

E52 Cube Style

E51, Factory Sealed

Unless otherwise noted, the products contained in this section should not be used for functional safety applications. These products were not designed or tested to IEC 60947-5-3 or recommended for functional safety.

Learn Online

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.

Revision notes

Volume 8—Sensing Solutions, CA08100010E

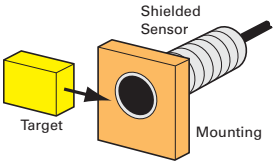
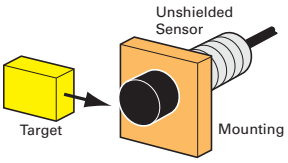
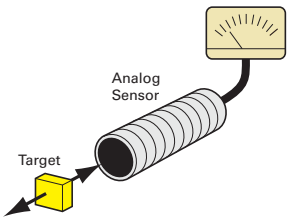
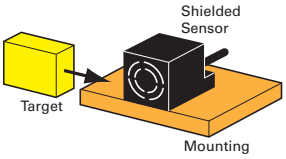
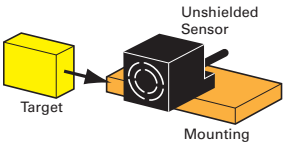
Tab 3—Inductive Proximity Sensors

Revision date	Section	Change page(s)	Description
09/08/2017	3.0	V8-T3-3, V8-T3-6–V8-T3-10	Content edit
09/08/2017	3.1	V8-T3-11	Content edit
09/08/2017	3.2	V8-T3-18	Content edit
09/08/2017	3.3	V8-T3-24, V8-T3-26	Content edit
09/08/2017	3.4	V8-T3-29	Content edit
09/08/2017	3.5	V8-T3-35 V8-T3-44–V8-T3-46	Content edit
09/08/2017	3.6	V8-T3-49, V8-T3-50	Content edit
09/08/2017	3.7	V8-T3-55	Content edit
09/08/2017	3.8	V8-T3-58	Content edit
09/08/2017	3.9	V8-T3-62	Content edit
09/08/2017	3.10	V8-T3-65, V8-T3-67	Content edit
09/08/2017	3.11	V8-T3-71	Content edit
09/08/2017	3.12	V8-T3-76	Content edit
09/08/2017	3.13	V8-T3-79	Content edit
09/08/2017	3.14	V8-T3-83	Content edit
09/08/2017	3.15	V8-T3-86	Content edit
09/08/2017	3.16	V8-T3-88–V8-T3-91	Content edit
09/08/2017	3.17	V8-T3-97	Content edit
09/08/2017	All	All	Revision date changed to September 2017

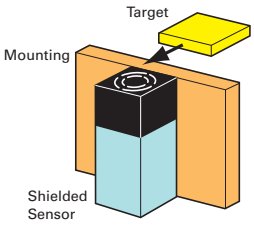
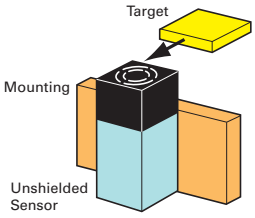
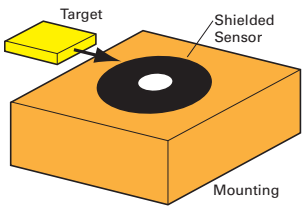
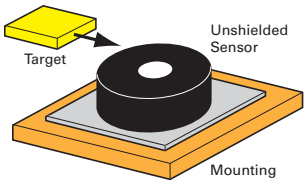
Powering Business Worldwide

Quick Reference Guide

Inductive Proximity Sensors

Sensing Application	Sensing Style	Size	Max Range	Product Family	Page
	Shielded tubular	4 mm	0.8 mm	Small Diameter Sensors	**V8-T3-65**
		5 mm	0.8 mm	Small Diameter Sensors	**V8-T3-65**
		6.5 mm	1 mm	Small Diameter Sensors	**V8-T3-65**
		8 mm	3 mm	Small Diameter Sensors	**V8-T3-65**
		12 mm	4 mm	iProx™ Sensors	**V8-T3-11**
			4 mm	E57P Performance Sensors	**V8-T3-18**, **V8-T3-24**
			4 mm	E57G General Purpose Sensors	**V8-T3-29**
		18 mm	8 mm	iProx Sensors	**V8-T3-11**
			8 mm	E57P Performance Sensors	**V8-T3-18**, **V8-T3-24**
			8 mm	E57G General Purpose Sensors	**V8-T3-29**
		30 mm	15 mm	iProx Sensors	**V8-T3-11**
			15 mm	E57P Performance Sensors	**V8-T3-18**, **V8-T3-24**
			15 mm	E57G General Purpose Sensors	**V8-T3-29**
	Unshielded tubular	6.5 mm	2 mm	Small Diameter	**V8-T3-65**
		8 mm	6 mm	Small Diameter	**V8-T3-65**
		12mm	10 mm	iProx Sensors	**V8-T3-11**
			8 mm	E57P Performance Sensors	**V8-T3-18**, **V8-T3-24**
			8 mm	E57G General Purpose Sensors	**V8-T3-29**
		18 mm	18 mm	iProx Sensors	**V8-T3-11**
			12 mm	E57P Performance Sensors	**V8-T3-18**, **V8-T3-24**
			12 mm	E57G General Purpose Sensors	**V8-T3-29**
		30 mm	29 mm	iProx Sensors	**V8-T3-11**
			22 mm	E57P Performance Sensors	**V8-T3-18**, **V8-T3-24**
			22 mm	E57G General Purpose Sensors	**V8-T3-29**
	Analog tubular	12 mm	8 mm	AccuProx™ Analog Sensors	**V8-T3-49**
		18 mm	15 mm	AccuProx Analog Sensors	**V8-T3-49**
		30 mm	25 mm	AccuProx Analog Sensors	**V8-T3-49**
	Shielded cube	40 x 40 x 40 mm	20 mm	E52 Cube Style Sensors	**V8-T3-79**
	Unshielded cube	40 x 40 x 40 mm	40 mm	E52 Cube Style Sensors	**V8-T3-79**

Inductive Proximity Sensors, continued

Sensing Application	Sensing Style	Size	Max Range	Product Family	Page
	Shielded limit switch	118 x 40 x 40 mm 114 x 39 x 38.4 mm	13 mm	E51 Modular Limit Switch Style Sensors E51 Limit Switch Style, Factory Sealed 6P+ Sensors E55 Limit Switch Style Sensors with Nonmetallic Housings	**V8-T3-88**, **V8-T3-97**, **V8-T3-86**
	Unshielded limit switch	118 x 40 x 40 mm 114 x 39 x 38.4 mm	24 mm	E51 Series E55 Series	**V8-T3-88**, **V8-T3-86**
	Shielded pancake	79 x 79 x 39 mm	40 mm	E56 Series	**V8-T3-71**
	Unshielded pancake	79 x 79 x 39 mm 110 x 110 x 41 mm 171.5 x 171.5 x 67.5 mm	100 mm	E56 Series	**V8-T3-71**

Technical Reference

Inductive Proximity Sensors

General

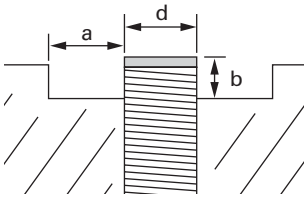
There are a number of factors which should be considered when applying induction proximity sensors. A detailed discussion of these factors can be found on **Page V8-T12-4**. Presented below are a few of the more important considerations for quick reference.

Mounting

Inductive proximity sensors are available in two classifications: shielded (also known as embeddable or flush mountable) and unshielded (non-embeddable or non-flush mountable). What these terms refer to is the distance to surrounding metal that the device can be mounted. In the case of a shielded sensor the device can be mounted with the sensor completely surrounded by metal.

In the case of an unshielded sensor, a metal free zone must be provided when mounting the sensor. The size of the metal free zone is dependent on both the size of the sensor and the type of sensing range it has, for example, standard or extended.

Mounting Ranges



Shielding	a	b
Standard Range		
Shielded	0	0
Unshielded	2 x Sn	Cap height
Extended Range		
Semi-shielded	Sn	d
Non-embeddable	2 x Sn	Cap height

Where **a** and **b** are the metal free dimensions.

When mounting the sensors, do not exceed the following recommended torque specifications.

Torque Specifications

Stainless Steel	Nickel-Plated Brass
12 mm Diameter	
35 lb-in (4.0 Nm)	20 lb-in (2.3 Nm)
18 mm Diameter	
70 lb-in (7.9 Nm)	70 lb-in (7.9 Nm)
30 mm Diameter	
70 lb-in (7.9 Nm)	70 lb-in (7.9 Nm)

Extended Range Sensors

Extended range proximity sensors by Eaton's Electrical Sector offer sensing distances almost three times greater than conventional devices. They are available in semi-shielded designs: mounted similar to an embeddable sensor—and non-embeddable designs requiring more metal free zone area than conventional unshielded sensors. All are available in a variety of circuits and terminations.

Target Material

When manufacturers of inductive proximity sensors state the sensing range of their devices, they are usually based upon a ferrous target made of carbon-rolled steel (IE FE 360) defined by ISO630. For example, in this product guide the E57P-18SPN5-C2 has a sensing range of 5 mm based upon a target of mild steel.

Sensing ranges to targets made of non-ferrous metals have to have a correction factor applied as listed in the table below. To use this table, multiply the sensing distance of the device by the factor given.

Example: The E57P-18SPN5-C2 has a sensing range of 5 mm. When used to sense a brass target, the sensing range becomes 2.25 mm (5 mm x 0.45).

Table of Correction Factors

Multiply sensing range of device by factor given below.

Correction Factors

	Sensor Size				
Target	**4–8 mm**	**12 mm**	**18 mm**	**30 mm**	**Limit Switch**
Stainless steel 400	0.90	0.90	1.0	1.0	1.0
Stainless steel 300	0.65	0.70	0.70	0.75	0.85
Brass	0.35	0.45	0.45	0.45	0.5
Aluminum	0.35	0.40	0.45	0.40	0.47
Copper	0.30	0.25	0.35	0.30	0.40

Target Size

Often overlooked when applying sensors is the fact that the manufacturer's stated sensing ranges are also dependent upon target size. The table below reflects the standard target sizes which were used to determine sensing ranges.

If targets are the same size or greater than standard, no reduction in sensing distance will occur. However, a smaller target size will result in a decrease in sensing range.

A general rule of thumb is that the target size shall be three times the range or the size of the sensor face, whichever is larger.

Standard Target Size ①

	Standard Sensing Range		Extended Sensing Range	
Target	**Shielded Devices**	**Unshielded Devices**	**Semi-Shield Devices**	**Non-Embeddable Devices**
4 mm	4 mm square	4 mm square	—	—
5 mm	5 mm square	5 mm square	—	—
6.5 mm	6.5 mm square	6.5 mm square	—	—
8 mm	8 mm square	8 mm square	—	—
12 mm	12 mm square	12 mm square	18 mm square	30 mm square
18 mm	18 mm square	24 mm square	36 mm square	60 mm square
30 mm	30 mm square	45 mm square	66 mm square	—
Limit switch	45 mm square	72 mm square	—	—

Note

① Targets are 1 mm thick.

Product Selection Guide

iProx

Page V8-T3-11

Overview

Designed to be the highest performing tubular inductive sensor. Standard features include extended sensing ranges, high noise-immunity, extreme durability and includes Autoconfigure Technology. Advanced features include output delay, speed detection and cloning with ProxView Software.

Applications

Automotive, machine tool, material handling where high sensing performance and inventory consolidation is a priority.

Product Features

Auto-configure technology automatically detects a sinking (NPN) or sourcing (PNP) connection and switches the sensor accordingly, without any user intervention

Optional computer programming cable and Windows-based ProxView configuration software makes it easy to customize sensors

Clone the sensor to match the characteristics of more than 4,800 competitive models, or configure it to match your specific application needs

Advanced programmable features such as dual outputs, output delay, speed detection and more

Technical Data and Specifications

Current ratings—
AC: 250 mA
DC: 300 mA

Enclosure ratings—
NEMA® 4, 4X, 6, 6P, 12, 13
IEC IP67, IP69K

Construction—
Stainless steel

Approvals

UL® Listed, E166051
UL Tested to Canadian safety standards
CE
RoHS Compliant

E57P Performance Series

Page V8-T3-18

Overview

High performance inductive sensors. Extended and standard ranges available.

Applications

Automotive, machine tool, material handling where high sensing performance and inventory consolidation is a priority.

Product Features

12, 18 and 30 mm diameters

Three-wire DC sensors

360° LED indicators standard

NO or NC outputs

Short-circuit protection

Resettable short-circuit protected and reverse polarity on select models

Robust stainless steel tubes, shock-resistant front caps, polycarbonate end bells, and impact-absorbing potting compound are resistant to physical and environmental abuse in high temperature, high pressure washdown and high shock and vibration applications

Technical Data and Specifications

Current ratings—
DC: 300 mA

Enclosure ratings—IP67, IP69K;
NEMA 4, 4X, 6, 6P

Construction—
Stainless steel housing and nuts

Approvals

UL Listed, E166051
UL Tested to Canadian safety standards
CE
RoHS Compliant

E57PS Performance Short Body

Page V8-T3-24

Overview

High performance inductive sensors with the ability to fit into tighter spaces.

Applications

Automotive, machine tool, material handling where high sensing performance and inventory consolidation is a priority.

Product Features

12, 18 and 30 mm diameters

Three-wire DC sensors

360° LED indicators standard

NO or NC outputs

Short-circuit protection

Resettable short-circuit protected and reverse polarity on select models

Robust stainless steel tubes, shock-resistant front caps, polycarbonate end bells, and impact-absorbing potting compound are resistant to physical and environmental abuse in high temperature, high pressure washdown and high shock and vibration applications

Technical Data and Specifications

Current ratings—
DC: 300 mA

Enclosure ratings—IP67, IP69K;
NEMA 4, 4X, 6, 6P

Construction—
Stainless steel housing and nuts

Approvals

UL Listed, E166051
UL Tested to Canadian safety standards
CE
RoHS Compliant

E57G General Purpose

Page V8-T3-29

Overview

This full-line, tubular proximity sensor family provides a cost-effective solution for high volume OEM use.

Applications

Machine tool detection, press applications, cam detection, material handling, valve and shaft position, automotive assembly.

Product Features

12, 18 and 30 mm diameters

Three-wire DC sensors

360° LED indicators standard

NO or NC outputs

Short-circuit protection

Resettable short-circuit protected and reverse polarity on select models

Robust stainless steel tubes, shock-resistant front caps, polycarbonate end bells, and impact-absorbing potting compound are resistant to physical and environmental abuse in high temperature, high pressure washdown and high shock and vibration applications

Technical Data and Specifications

Current ratings—
DC: 100 mA

Enclosure ratings—IP67;
NEMA 4, 4X, 6, 6P

Construction—
Stainless steel housing and nickel-brass nuts

Approvals

UL Listed, E166051
UL Tested to Canadian safety standards
CE
RoHS Compliant

E57 Two-Wire (AC, AC/DC, DC) Proximity

Page V8-T3-35

Overview

Various models available in two-wire configurations:
Stainless steel (AC, AC/DC)
Stainless steel short body (AC, AC/DC)
Nickel-brass (AC, DC)

Applications

Machine tool detection, press applications, cam detection, material handling, valve and shaft position, automotive assembly.

Product Features

12, 18 and 30 mm diameters
Two-wire AC, AC/DC, DC
Shielded and unshielded models
Standard and extended ranges
LED indicators
Cable and micro-connector
NO or NC outputs

Technical Data and Specifications

Stainless steel:
Current ratings—
500 mA maximum
Enclosure ratings—IP67, IP69K;
NEMA 4, 4X, 6, 6P, 12, 13
Nickel-Brass:
Current ratings—
200 mA (AC); 100 mA (DC)
Enclosure ratings—
IP69K, IP67

Approvals

RoHS Compliant
Stainless Steel:
UL Listed, E166051
UL Tested to Canadian safety standards
CE (AC/DC only)
Nickel-Brass:
CSA Certified, 224447
Products certified by CSA for US
CE (DC only)

AccuProx

Page V8-T3-49

Overview

AccuProx sensors feature analog outputs that change linearly as the target moves closer or further from the sensor face.

Applications

Part positioning, distance, size and thickness measurement, general inspection and error proofing (such as material imperfection or blemish detection), eccentricity or absolute angle detection, identification of different metals

Product Features

Extended linear sensing range of up to 25 mm—three times longer than standard tubular analog inductive sensors
Outputs available in current (4–20 or 0–20 mA) and voltage (0–10 V)
High output resolution and repeatability for applications requiring precision sensing performance
Robust stainless steel barrel, shock-resistant front cap, polycarbonate end bell and impact-absorbing potting compound
Ideal for extreme temperature or high pressure washdown environments

Technical Data and Specifications

Current ratings—
0–10 Vdc, 0–20 mA, 4–20 mA
Enclosure ratings—
NEMA 4, 4X, 6, 6P, 13
Construction—
Stainless steel

Approvals

UL Listed, E166051
UL Tested to Canadian safety standards
CE
RoHS Compliant

Ferrous Only Tubular

Page V8-T3-55

Overview

Sensors designed to detect only ferrous metals (steel/iron).

Applications

Workcell applications, automotive and aircraft production.

Product Features

18 mm diameters
Two-wire AC or three-wire DC
NO or NC outputs
Micro- and mini-pin terminations
LED indicators

Technical Data and Specifications

Current ratings—
AC: 500 mA continuous
DC: 200 mA continuous
Enclosure ratings—
NEMA 4, 4X, 6, 6P, 12, 13
IEC IP67
Construction—
Stainless steel

Approvals

CSA Certified
Products certified by CSA for US
CE
RoHS Compliant

Metal Face

Page V8-T3-58

Overview

Tough sensors with thick stainless steel sensing faces and barrels.

Applications

Metal cutting operations where damage to sensor face could occur.

Product Features

12, 18 and 30 mm diameters
Two-wire AC or three-wire DC
20 mil thick stainless steel face
303 stainless steel barrel
LED indicator
2-meter cable, micro- and mini-pin connections

Technical Data and Specifications

Current ratings—
AC: 500 mA continuous
DC: 200 mA continuous
Enclosure ratings—
NEMA 4, 4X, 6, 6P, 12, 13
IEC IP67
Construction—
Stainless steel

Approvals

CSA Certified
Products certified by CSA for US
CE
RoHS Compliant

High Current Output

Page V8-T3-62

Overview

DC sensors which can carry extremely large continuous inrush current.

Applications

Heavy-duty vehicles, cement mixers, lift trucks, front end loaders, farm equipment.

Product Features

30 mm diameter stainless steel housing

Solid-state output for 12 ampere continuous, 50 ampere inrush capacity

–40° to 158°F (–40° to 70°C) temperature range

NO and NC isolated outputs

Heavy gauge SJO cable

Technical Data and Specifications

Current ratings—
Varies by model

Enclosure ratings—
NEMA 4, 4X, 6, 6P, 12, 13
IEC IP67

Construction—
Stainless steel

Approvals

RoHS Compliant

RoHS COMPLIANT

Small Diameter

Page V8-T3-65

Overview

Small diameter and short body (4, 5, 6.5 and 8 mm) tubular housings for tight sensing applications.

Applications

Automation equipment, robotics, machine tool, counting, sorting

Product Features

Variety of diameters in stainless steel housings

PVC cable, micro- and nano-pin connections

LED indicators standard

Short overall lengths

Short circuit and reverse polarity protection

Technical Data and Specifications

Current ratings—
DC: 200 mA maximum

Enclosure ratings—
NEMA 4, 4X, 6, 6P, 12, 13
IEC IP67

Construction—
Stainless steel

Approvals

CE

RoHS Compliant

8 mm standard models only:
CSA Certified, 224447
Products certified by CSA for US

CE c SP us RoHS COMPLIANT

E56 Pancake

Page V8-T3-71

Overview

Self-contained sensors capable of sensing up to 3.94 inches (100 mm).

Applications

Oil rig operations, floor conveyors, automotive assembly, overhead cranes

Product Features

40, 50, 70 and 100 mm sensing distances

Four-wire DC models have complementary outputs (1 NO/1 NC)

Four-wire DC models use auto-configure technology, which allows the sensor to automatically adapt for NPN or PNP without user intervention

Available in two-wire AC versions

Power and output LED indicator

Quick disconnect option

Short-circuit protected in DC

Longest sensing distances available

Technical Data and Specifications

Current ratings—
AC: 500 mA continuous
DC: 200 mA continuous

Enclosure ratings—
NEMA 4, 4X, 12, 13
(some models also rated NEMA 6)
IEC IP66

Construction—
PPS

Approvals

UL Listed, E166051 (DC models only)

UL tested to Canadian safety standards

CE (DC models only)

RoHS Compliant

c UL us LISTED CE RoHS COMPLIANT

Tubular, Nonmetallic Housing

Page V8-T3-76

Overview

Tubular sensors with nonmetallic housings offer high corrosion resistance.

Applications

Food processing lines, high washdown environments

Product Features

12, 18 and 30 mm diameters shielded and unshielded sensing

Normally open or closed outputs

AC and DC voltages

Tough ABS plastic housing

Output LED on all models

Technical Data and Specifications

Current ratings—
AC: 150 mA
DC: 200 mA

Enclosure ratings—
NEMA 3, 3S, 4, 4X, 13
IEC IP66

Construction—
ABS plastic

Approvals

CE

RoHS Compliant

E52 Cube Style

Page V8-T3-79

Overview

A family of industry-standard, cube-sized inductive sensors with long range capabilities.

Applications

Automotive, manufacturing, machinery OEMs

Product Features

Long inductive proximity ranges available (up to 40 mm sensing distance)

Four-wire DC models have complementary outputs (1 NO/1 NC)

Four-wire DC models use auto-configure technology, which allows the sensor to automatically adapt for NPN or PNP without user intervention

Robust design featuring vibration and impact-absorbing potting compound

Ideal for extreme temperatures or high pressure washdown environments

Technical Data and Specifications

Current ratings—
DC: 300 mA maximum

Enclosure ratings—
NEMA 4, 4X, 6, 6P, 12, 13
IEC IP67

Construction—
Zinc alloy/PPS, PL

Approvals

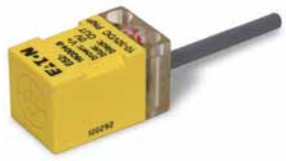
UL Listed, E166051

UL tested to Canadian safety standards

CE

RoHS Compliant

E52 Rectangular Style



Page V8-T3-83

Overview

A variety of small rectangular sensors for limited space applications.

Applications

Tight applications where conventional sensor are too large

Product Features

Variety of housing styles R12, R18, Q16, Q25

10 to 30 Vdc

NPN and PNP output

Short-circuit protection

LED indicator for output status

Technical Data and Specifications

Current ratings—
DC: 100 mA maximum

Enclosure ratings—
NEMA 1, 2, 3, 3S, 4, 12
IEC IP66

Construction—
PBT composition housing

Approvals

CE (except E52RAL)

RoHS Compliant

E55 Limit Switch Style, Nonmetallic Housing

Page V8-T3-86

Overview

These nonmetallic sensors provide corrosion resistance in a limit switch style housing.

Applications

Food processing lines, high washdown environments

Product Features

5 position head can be top mounted or in any of four side positions

Long sensing ranges up to 40 mm

Normally open or closed outputs

AC voltages

Tough PBT resin housing

Technical Data and Specifications

Current ratings—
AC: 400 mA

Enclosure ratings—
NEMA 4, 4X, 6, 12, 13
IEC IP67

Construction—
PBT resin

Approvals

CE

RoHS Compliant

E51 Modular Switch Style, Modular

Page V8-T3-88

Overview

Modular design allows maximum use of inventories in these limit switch style housings. Solid-state circuitry in a variety of sensing ranges.

Applications

Machine tool, punch presses, automotive, conveyor systems

Product Features

Modular heads, switch bodies, receptacles

Shielded or unshielded sensing ranges

Solid-state electronics

Viton gasket seals

LED indicators for power and output status

Top and side sensing heads

Alternate frequency for side by side operation

Components individually labeled for easy identification

Technical Data and Specifications

Current ratings—
AC: 1 ampere continuous
DC: 0.6 ampere continuous

Enclosure ratings—
NEMA 3, 3S, 4, 4X, 6, 6P, 12, 13
IEC IP67

Class I, Class II, Division 2
Groups A, B, C, D, F and G; Class III

Construction—
Die cast zinc
Gasket material: Viton

Approvals

UL Listed, E166051, E183975

CSA Certified, 50513

RoHS Compliant

E51 Limit Switch Style, Factory Sealed 6P +

Page V8-T3-97

Overview

Completely epoxy filled in unitized, one piece limit switch style construction for reliable performance under the most adverse of environmental conditions.

Applications

All corrosive environments: Coolants/ cutting oils, automotive applications

Product Features

One piece housing on switch body/ receptacle

Head and housing totally epoxy encapsulated

Side sensing head can be unfastened and moved to any of four positions

Quick disconnect options

Corrosive resistant epoxy coated housing

Technical Data and Specifications

Current ratings—
AC: 1 ampere continuous
DC: 0.6 ampere continuous

Enclosure ratings—
NEMA 3, 3S, 4, 4X, 6, 6P, 12, 13
IEC IP67

Construction—
Die cast zinc
Gasket material: Viton®

Approvals

UL Listed, E166051

CSA Certified, 50513

RoHS Compliant

iProx Sensors

Contents

iProx Sensors

Product Description

The iProx represents the highest performance, most versatile tubular inductive sensor offered by Eaton's Electrical Sector. By utilizing an embedded micro-processor and exclusive SmartSense™ technology, iProx can sense up to three times farther than typical sensors of its class, while providing an unheard-of level of customization.

Both shielded and unshielded versions of iProx feature extended sensing ranges. This allows the sensor to be mounted farther from the target, thereby reducing the potential for target impacts and increasing the sensing reliability of your application.

The iProx also includes a wide range of advanced features that can be enabled via optional programming tools. Using the ProxView Windows-based software package, an entirely custom sensor can be programmed to perfectly fit an application.

Sensor characteristics, such as sensing range, can be customized down to the nearest tenth of a millimeter. Outputs can be changed from NO to NC. The iProx even features built-in timing delays and speed detection logic—no PLC programming is necessary.

With extended sensing range, quality construction and the ability to adapt to its environment, iProx is the ideal choice for even the most demanding inductive sensing applications.

Application Description

Typical Applications

- Automotive
- Machine tool
- Material handling
- Metalworking

Features

- Available in AC two-wire, DC three-wire and unique DC four-wire with complementary (NO-NC) or dual NO outputs
- Reliably detect metal targets at up to three times the range of conventional shielded or unshielded tubular inductive sensors
- Quality construction using a stainless steel barrel, 360-degree dual-color LED indicator, Ryton® impact-resistant face cap and vibration-absorbing potting compound
- Auto-configure technology automatically detects a sinking (NPN) or sourcing (PNP) connection and switches the sensor accordingly, without any user intervention
- Exclusive SmartSense embedded microprocessor technology allows for customizable range, band sensing, nuisance metal rejection, timing delays and over/under speed detection
- Optional computer programming cable and Windows-based ProxView configuration software makes it easy to customize sensors
- Withstands high electrical noise (up to 20 V/m)
- Resistant to extreme temperatures (–40 °F [–40 °C])

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

Standards and Certifications

- UL Listed, E166051
- UL Tested to Canadian safety standards
- CE
- RoHS Compliant

c UL us LISTED CE RoHS COMPLIANT

⚠ 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

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

iProx Sensors

Note: Custom iProx models can also be ordered directly from the factory with pre-set ranges, outputs and connectors. Consult the Eaton Application Engineers at 1-800-426-9184 for more information.

3

Two-Wire Sensors

	Operating Voltage	Sensing Range	Shielding	Connection Type ①	NO Output Catalog Number ②	NC Output Catalog Number ②
Standard Range	**12 mm Diameter**					
	20–132 Vac	4 mm	Shielded	3-pin micro AC connector	**E59-M12A105A01-A1** ♣	**E59-M12A105A01-A2** ♣
				3-pin micro AC pigtail ③	**E59-M12A105A01P-A1** ♣	**E59-M12A105A01P-A2** ♣
				3-pin mini AC pigtail ③	**E59-M12A105A01PB-A1** ♣	**E59-M12A105A01PB-A2** ♣
				2-meter cable	**E59-M12A105C02-A1**	**E59-M12A105C02-A2**
Extended Range		10 mm	Unshielded	3-pin micro AC connector	**E59-M12C110A01-A1** ♣	**E59-M12C110A01-A2** ♣
				3-pin micro AC pigtail ③	**E59-M12C110A01P-A1** ♣	**E59-M12C110A01P-A2** ♣
				3-pin mini AC pigtail ③	**E59-M12C110A01PB-A1** ♣	**E59-M12C110A01PB-A2** ♣
				2-meter cable	**E59-M12C110C02-A1**	**E59-M12C110C02-A2**
Standard Range	**18 mm Diameter**					
	20–132 Vac	8 mm	Shielded	3-pin micro AC connector	**E59-M18A109A01-A1** ♣	**E59-M18A109A01-A2** ♣
				3-pin micro AC pigtail ③	**E59-M18A109A01P-A1** ♣	**E59-M18A109A01P-A2** ♣
				3-pin mini AC pigtail ③	**E59-M18A109A01PB-A1** ♣	**E59-M18A109A01PB-A2** ♣
				2-meter cable	**E59-M18A109C02-A1**	**E59-M18A109C02-A2**
Extended Range		18 mm	Unshielded	3-pin micro AC connector	**E59-M18C118A01-A1** ♣	**E59-M18C118A01-A2** ♣
				3-pin micro AC pigtail ③	**E59-M18C118A01P-A1** ♣	**E59-M18C118A01P-A2** ♣
				3-pin mini AC pigtail ③	**E59-M18C118A01PB-A1** ♣	**E59-M18C118A01PB-A2** ♣
				2-meter cable	**E59-M18C118C02-A1**	**E59-M18C118C02-A2**
Standard Range	**30 mm Diameter**					
	20–132 Vac	15 mm	Shielded	3-pin micro AC connector	**E59-M30A115A01-A1** ♣	**E59-M30A115A01-A2** ♣
				3-pin micro AC pigtail ③	**E59-M30A115A01P-A1** ♣	**E59-M30A115A01P-A2** ♣
				3-pin mini AC pigtail ③	**E59-M30A115A01PB-A1** ♣	**E59-M30A115A01PB-A2** ♣
				2-meter cable	**E59-M30A115C02-A1**	**E59-M30A115C02-A2**
Extended Range		29 mm	Unshielded	3-pin micro AC connector	**E59-M30C129A01-A1** ♣	**E59-M30C129A01-A2** ♣
				3-pin micro AC pigtail ③	**E59-M30C129A01P-A1** ♣	**E59-M30C129A01P-A2** ♣
				3-pin mini AC pigtail ③	**E59-M30C129A01PB-A1** ♣	**E59-M30C129A01PB-A2** ♣
				2-meter cable	**E59-M30C129C02-A1**	**E59-M30C129C02-A2**

Notes

♣ See listing of compatible connector cables on **Page V8-T3-15**.

① For sensors with custom cable lengths or PUR jackets, contact Application Engineering at 1-800-426-9184.

② Sensors are ordered with pre-set outputs from the factory, but can be later programmed either NO or NC using the ProxView software.

③ Standard pigtail cable length is 12 in.

Note: Custom iProx models can also be ordered directly from the factory with pre-set ranges, outputs and connectors. Consult the Eaton Application Engineers at 1-800-426-9184 for more information.

Three-Wire Sensors

	Operating Voltage	Sensing Range	Shielding	Connection Type ①	NO Output Catalog Number ②	NC Output Catalog Number ②
Standard Range	**12 mm Diameter**					
	6–48 Vdc	4 mm	Shielded	4-pin micro DC connector	**E59-M12A105D01-D1** ⠿	**E59-M12A105D01-D2** ⠿
				4-pin micro DC pigtail ③	**E59-M12A105D01P-D1** ⠿	**E59-M12A105D01P-D2** ⠿
				2-meter cable	**E59-M12A105C02-D1**	**E59-M12A105C02-D2**
Extended Range		10 mm	Unshielded	4-pin micro DC connector	**E59-M12C110D01-D1** ⠿	**E59-M12C110D01-D2** ⠿
				4-pin micro DC pigtail ③	**E59-M12C110D01P-D1** ⠿	**E59-M12C110D01P-D2** ⠿
				2-meter cable	**E59-M12C110C02-D1**	**E59-M12C110C02-D2**
Standard Range	**18 mm Diameter**					
	6–48 Vdc	8 mm	Shielded	4-pin micro DC connector	**E59-M18A108D01-D1** ⠿	**E59-M18A108D01-D2** ⠿
				4-pin micro DC pigtail ③	**E59-M18A108D01P-D1** ⠿	**E59-M18A108D01P-D2** ⠿
				2-meter cable	**E59-M18A108C02-D1**	**E59-M18A108C02-D2**
Extended Range		18 mm	Unshielded	4-pin micro DC connector	**E59-M18C116D01-D1** ⠿	**E59-M18C116D01-D2** ⠿
				4-pin micro DC pigtail ③	**E59-M18C116D01P-D1** ⠿	**E59-M18C116D01P-D2** ⠿
				2-meter cable	**E59-M18C116C02-D1**	**E59-M18C116C02-D2**
Standard Range	**30 mm Diameter**					
	6–48 Vdc	15 mm	Shielded	4-pin micro DC connector	**E59-M30A115D01-D1** ⠿	**E59-M30A115D01-D2** ⠿
				4-pin micro DC pigtail ③	**E59-M30A115D01P-D1** ⠿	**E59-M30A115D01P-D2** ⠿
				2-meter cable	**E59-M30A115C02-D1**	**E59-M30A115C02-D2**
Extended Range		29 mm	Unshielded	4-pin micro DC connector	**E59-M30C129D01-D1** ⠿	**E59-M30C129D01-D2** ⠿
				4-pin micro DC pigtail ③	**E59-M30C129D01P-D1** ⠿	**E59-M30C129D01P-D2** ⠿
				2-meter cable	**E59-M30C129C02-D1**	**E59-M30C129C02-D2**

Notes

⠿ See listing of compatible connector cables on **Page V8-T3-15**.

① For sensors with custom cable lengths or PUR jackets, contact Application Engineering at 1-800-426-9184.

② Sensors are ordered with pre-set outputs from the factory, but can be later programmed either NO or NC using the ProxView software.

③ Standard pigtail cable length is 12 in.

3

Complementary and Dual Output Sensors

Four-Wire Sensors

	Operating Voltage	Sensing Range	Shielding	Output Type	Connection Type	Complementary Output (1NO-1NC) Catalog Number	Dual NO Output Catalog Number ①
Standard Range	**12 mm Diameter**						
	6–48 Vdc	4 mm	Shielded	NPN (sinking)	4-pin micro DC connector	**E59-M12A105D01-D3NN** ⠿	**E59-M12A105D01-D1NN** ⠿
					2-meter cable	**E59-M12A105C02-D3NN**	**E59-M12A105C02-D1NN**
				PNP (sourcing)	4-pin micro DC connector	**E59-M12A105D01-D3PP** ⠿	**E59-M12A105D01-D1PP** ⠿
					2-meter cable	**E59-M12A105C02-D3PP**	**E59-M12A105C02-D1PP**
Extended Range		10 mm	Unshielded	NPN (sinking)	4-pin micro DC connector	**E59-M12C110D01-D3NN** ⠿	**E59-M12C110D01-D1NN** ⠿
					2-meter cable	**E59-M12C110C02-D3NN**	**E59-M12C110C02-D1NN**
				PNP (sourcing)	4-pin micro DC connector	**E59-M12C110D01-D3PP** ⠿	**E59-M12C110D01-D1PP** ⠿
					2-meter cable	**E59-M12C110C02-D3PP**	**E59-M12C110C02-D1PP**
Standard Range	**18 mm Diameter**						
	6–48 Vdc	8 mm	Shielded	NPN (sinking)	4-pin micro DC connector	**E59-M18A108D01-D3NN** ⠿	**E59-M18A108D01-D1NN** ⠿
					2-meter cable	**E59-M18A108C02-D3NN**	**E59-M18A108C02-D1NN**
				PNP (sourcing)	4-pin micro DC connector	**E59-M18A108D01-D3PP** ⠿	**E59-M18A108D01-D1PP** ⠿
					2-meter cable	**E59-M18A108C02-D3PP**	**E59-M18A108C02-D1PP**
Extended Range		18 mm	Unshielded	NPN (sinking)	4-pin micro DC connector	**E59-M18C116D01-D3NN** ⠿	**E59-M18C116D01-D1NN** ⠿
					2-meter cable	**E59-M18C116C02-D3NN**	**E59-M18C116C02-D1NN**
				PNP (sourcing)	4-pin micro DC connector	**E59-M18C116D01-D3PP** ⠿	**E59-M18C116D01-D1PP** ⠿
					2-meter cable	**E59-M18C116C02-D3PP**	**E59-M18C116C02-D1PP**
Standard Range	**30 mm Diameter**						
	6–48 Vdc	15 mm	Shielded	NPN (sinking)	4-pin micro DC connector	**E59-M30A115D01-D3NN** ⠿	**E59-M30A115D01-D1NN** ⠿
					2-meter cable	**E59-M30A115C02-D3NN**	**E59-M30A115C02-D1NN**
				PNP (sourcing)	4-pin micro DC connector	**E59-M30A115D01-D3PP** ⠿	**E59-M30A115D01-D1PP** ⠿
					2-meter cable	**E59-M30A115C02-D3PP**	**E59-M30A115C02-D1PP**
Extended Range		29 mm	Unshielded	NPN (sinking)	4-pin micro DC connector	**E59-M30C129D01-D3NN** ⠿	**E59-M30C129D01-D1NN** ⠿
					2-meter cable	**E59-M30C129C02-D3NN**	**E59-M30C129C02-D1NN**
				PNP (sourcing)	4-pin micro DC connector	**E59-M30C129D01-D3PP** ⠿	**E59-M30C129D01-D1PP** ⠿
					2-meter cable	**E59-M30C129C02-D3PP**	**E59-M30C129C02-D1PP**

Notes

⠿ See listing of compatible connector cables on **Page V8-T3-15**.

① At this time, iProx Complementary and Dual Output models are not available with auto-sink/source detection. Therefore, PNP (sourcing) and NPN (sinking) models must be ordered separately.

Compatible Connector Cables

Standard Cables ①

	Current Rating at 600 V	Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number
Micro-Style Straight Female	**Micro-Style, Straight Female**							
	—	AC	3-pin, 3-wire	22 AWG	6.0 ft (2m)	 1-Green 2-Red/Black 3-Red/White	**CSAS3F3CY2202**	**CSAS3F3RY2202**
	—	DC	4-pin, 4-wire	22 AWG	6.0 ft (2m)	 1-Brown 2-White 3-Blue 4-Black	**CSDS4A4CY2202**	**CSDS4A4RY2202**
Mini-Style Straight Female	**Mini-Style, Straight Female**						**Catalog Number**	
	13 A	—	3-pin	16 AWG	6 ft (2m)	 1-Green 2-Black 3-White	**CSMS3F3CY1602**	

Accessories

iProx Sensors

	Description	Catalog Number
Software 	Step-by-step programming software required to program iProx. Compatible with Microsoft Windows® and Windows® Mobile devices.	**E59SW1**
Cable 	The iProx programming cable is used to program individual iProx sensors, providing a connection between the computer and the sensor. Connects to computer via a serial (RS-232) or USB port. (USB connection requires an adapter which is included with purchase.)	**E59RP1**
Labels 	Field applied labels for iProx sensor (100 pcs)	**E59LABEL**

Note

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

3

Starter Kit

iProx Starter Kits

Description	Catalog Number
Interested in custom programming iProx sensors to fit your application?	
These kits include everything needed to get the most out of iProx: a sensor, a programming cable (E59RP1), a micro connector cable (CSDS4A4CY2202) and ProxView software on CD-ROM (E59SW1).	
Starter kit includes:	
12 mm AC unshielded iProx sensor (E59-M12C110A01-A1)	**E5912ACKIT**
12 mm DC unshielded iProx sensor (E59-M12C110D01-D1)	**E5912DCKIT**
18 mm AC unshielded iProx sensor (E59-M18C118A01-A1)	**E5918ACKIT**
18 mm DC unshielded iProx sensor (E59-M18C116D01-D1)	**E5918DCKIT**
30 mm AC unshielded iProx sensor (E59-M30C129A01-A1)	**E5930ACKIT**
30 mm DC unshielded iProx sensor (E59-M30C129D01-D1)	**E5930DCKIT**

Technical Data and Specifications

iProx Sensors

Description	Two-Wire Sensors	Three-Wire Sensors
Input voltage	20–132 Vac	6–48 Vdc
Load current	250 mA	300 mA
Leakage current	≤1.7 mA at 32 °F (0 °C), 2.0 mA at –40 °F (–40 °C)	≤150 µA
Voltage drop	<5 Vac	≤2.5 Vdc
Burden current	—	≤15 mA
Protection	None	Auto reset
Switching hysteresis	<15% rated sensing distance	<15% rated sensing distance
Repeat accuracy	Shielded models: <1% sensing distance; Unshielded models: <3% sensing distance	Shielded models: <1% sensing distance; Unshielded models: <3% sensing distance
Surge capacity	3 A/30 ms	—
Temperature range	–40 to 158 °F (–40 to 70 °C)	–40 to 158 °F (–40 to 70 °C)
Material of construction	303 stainless steel; end bells: polycarbonate; face caps: Ryton®; cable: AWM style 20387 (PVC)	303 stainless steel; end bells: polycarbonate; face caps: Ryton®; cable: AWM style 20387 (PVC)
Vibration and shock	Vibration: 10 to 55 Hz, 1 mm amplitude, IEC 60068-2-6; shock: 30 g, 11 ms per IEC 68-2-27	Vibration: 10 to 55 Hz, 1 mm amplitude, IEC 60068-2-6; shock: 30 g, 11 ms per IEC 68-2-27
Indicator LED	360° viewable LED	360° viewable LED
Enclosure ratings	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67) IP69K ①	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67) IP69K ①

Response Time ②

		Three-Wire Sensors					
	Two-Wire Sensors	Shielded			Unshielded		
Description	All Two-Wire Models	12 mm	18 mm	30 mm	12 mm	18 mm	30 mm
Factory default mode	Shipped in "Side by Side Mode" by default (20 V/m)	580 Hz (10 V/m)	390 Hz (10 V/m)	240 Hz (10 V/m)	300 Hz (10 V/m)	150 Hz (10 V/m)	145 Hz (10 V/m)
Side by side ③	30 Hz (10 V/m)	50 Hz (20 V/m)	50 Hz (20 V/m)	50 Hz (20 V/m)	50 Hz (20 V/m)	50 Hz (20 V/m)	50 Hz (20 V/m)
High noise immunity mode	10 Hz (>20 V/m)	10 Hz (>20 V/m)	10 Hz (>20 V/m)	10 Hz (>20 V/m)	10 Hz (>20 V/m)	10 Hz (>20 V/m)	10 Hz (>20 V/m)

Notes

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

① Our products conform to NEMA® tests as indicated, however, some severe washdown applications can exceed these NEMA test specifications.

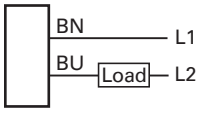
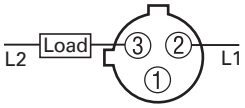
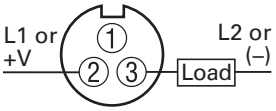
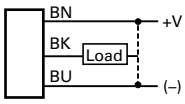
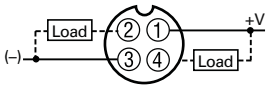
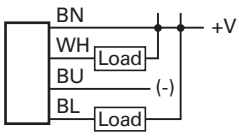
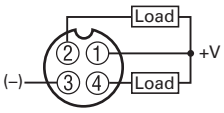
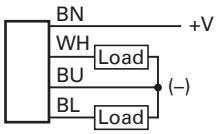
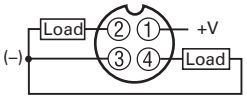
② iProx sensors may be programmed to perform in side by side or high noise immunity applications using the iProx programming cable (E59RP1) and ProxView software (E59SW1).

③ Use the side by side response time parameter when using the iProx Tray Programmer (E59TP1), iProx programming cable (E59RP1) and ProxView software (E59SW1).

Wiring Diagrams

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

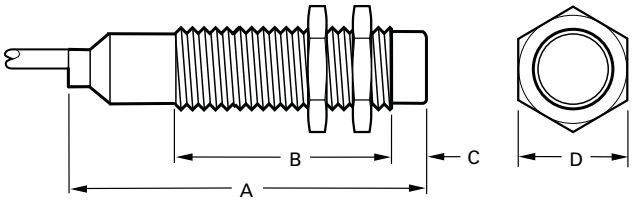
iProx Sensors

Operating Voltage	Output	Cable Models	Connector Models (Face View Male Shown) Micro	Mini
Two-Wire Sensors				
20–132 Vac	NO and NC			
Three-Wire Sensors				
6–48 Vdc	NO and NC (NPN and PNP) ①	② 	② 	—
Four-Wire Dual Output and Complementary Sensors				
6–48 Vdc	NO and NC (NPN)	③ 	③ 	—
	NO and NC (PNP)	③ 	③ 	—

Dimensions

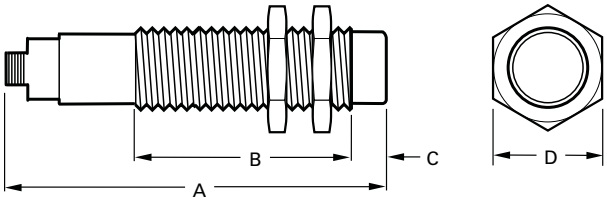
Approximate Dimensions in Inches (mm)

Cable Models



Size	Shielding	A	B	C	D
12 mm	Shielded	2.46 (62.4)	1.98 (50.3)	0.02 (0.5)	0.67 (17)
	Unshielded	2.46 (62.4)	1.64 (41.6)	0.36 (9)	0.67 (17)
18 mm	Shielded	2.54 (64.5)	2.00 (50.9)	0.02 (0.5)	0.94 (24)
	Unshielded	2.54 (64.5)	1.47 (37.4)	0.55 (14)	0.94 (24)
30 mm	Shielded	2.74 (69.6)	2.13 (54.1)	0.03 (0.75)	1.41 (36)
	Unshielded	2.74 (69.6)	1.41 (35.8)	0.75 (19)	1.41 (36)

Micro-Connector Models



Size	Shielding	A	B	C	D
12 mm	Shielded	2.71 (68.7)	1.98 (50.3)	0.02 (0.5)	0.67 (17)
	Unshielded	2.71 (68.7)	1.64 (41.6)	0.36 (9)	0.67 (17)
18 mm	Shielded	2.73 (69.3)	2.00 (50.9)	0.02 (0.5)	0.94 (24)
	Unshielded	2.73 (69.3)	1.47 (37.4)	0.55 (14)	0.94 (24)
30 mm	Shielded	2.92 (74.1)	2.13 (54.1)	0.03 (0.75)	1.41 (36)
	Unshielded	2.92 (74.1)	1.41 (35.8)	0.75 (19)	1.41 (36)

Notes

① The three-wire DC version of iProx automatically configures itself to NPN or PNP based on field wiring. No user intervention is required.
② Pin numbers 2 and 4 are internally jumpered together. Either pin may be used.
③ The complementary (1NO-1NC) output models feature the NC output on pin 2 (white).

3

E57P Performance Series Sensors

Contents

E57P Performance Series Sensors

Product Description

For sensing applications requiring more demanding specifications, the new E57P Performance series incorporates premium features without the premium price. With its stainless steel tubular body, IP69K rating, wide temperature range (down to –40 °C), fast switching speed and laser-etched markings, the E57P series provides value at a low price point.

Features

- 360° LED indicator
- Stainless steel tube
- 10–48 Vdc operating voltage
- Short-circuit protection
- –40 to 70 °C temperature range
- IP69K environmental rating
- Durable laser-engraved label
- Available in cable and micro-connector styles

Standards and Certifications

- UL Listed, E166051
- UL Tested to Canadian safety standards
- CE
- RoHS Compliant

c UL us LISTED CE RoHS COMPLIANT

⚠ 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

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

E57P Performance Sensors

Three-Wire Sensors

	Operating Voltage	Sensing Range (Sn)	Shielding	Connection Type ①	NO Output Catalog Number	NC Output Catalog Number
12 mm 	**12 mm Diameter End Sensing**					
	10–48 Vdc	2 mm (standard range)	Shielded (PNP)	2-meter cable	**E57P-12SPN2-C2**	**E57P-12SPC2-C2**
				4-pin micro DC connector	**E57P-12SPN2-Q**	**E57P-12SPC2-Q**
			Shielded (NPN)	2-meter cable	**E57P-12SNN2-C2**	**E57P-12SNC2-C2**
				4-pin micro DC connector	**E57P-12SNN2-Q**	**E57P-12SNC2-Q**
		4 mm (standard range)	Unshielded (PNP)	2-meter cable	**E57P-12UPN4-C2**	**E57P-12UPC4-C2**
				4-pin micro DC connector	**E57P-12UPN4-Q**	**E57P-12UPC4-Q**
			Unshielded (NPN)	2-meter cable	**E57P-12UNN4-C2**	**E57P-12UNC4-C2**
				4-pin micro DC connector	**E57P-12UNN4-Q**	**E57P-12UNC4-Q**
		4 mm (extended range)	Shielded (PNP)	2-meter cable	**E57P-12SPN4-C2**	**E57P-12SPC4-C2**
				4-pin micro DC connector	**E57P-12SPN4-Q**	**E57P-12SPC4-Q**
			Shielded (NPN)	2-meter cable	**E57P-12SNN4-C2**	**E57P-12SNC4-C2**
				4-pin micro DC connector	**E57P-12SNN4-Q**	**E57P-12SNC4-Q**
		8 mm (extended range)	Unshielded (PNP)	2-meter cable	**E57P-12UPN8-C2**	**E57P-12UPC8-C2**
				4-pin micro DC connector	**E57P-12UPN8-Q**	**E57P-12UPC8-Q**
			Unshielded (NPN)	2-meter cable	**E57P-12UNN8-C2**	**E57P-12UNC8-C2**
				4-pin micro DC connector	**E57P-12UNN8-Q**	**E57P-12UNC8-Q**
18 mm 	**18 mm Diameter End Sensing**					
	10–48 Vdc	5 mm (standard range)	Shielded (PNP)	2-meter cable	**E57P-18SPN5-C2**	**E57P-18SPC5-C2**
				4-pin micro DC connector	**E57P-18SPN5-Q**	**E57P-18SPC5-Q**
			Shielded (NPN)	2-meter cable	**E57P-18SNN5-C2**	**E57P-18SNC5-C2**
				4-pin micro DC connector	**E57P-18SNN5-Q**	**E57P-18SNC5-Q**
		8 mm (standard range)	Unshielded (PNP)	2-meter cable	**E57P-18UPN8-C2**	**E57P-18UPC8-C2**
				4-pin micro DC connector	**E57P-18UPN8-Q**	**E57P-18UPC8-Q**
			Unshielded (NPN)	2-meter cable	**E57P-18UNN8-C2**	**E57P-18UNC8-C2**
				4-pin micro DC connector	**E57P-18UNN8-Q**	**E57P-18UNC8-Q**
		8 mm (extended range)	Shielded (PNP)	2-meter cable	**E57P-18SPN8-C2**	**E57P-18SPC8-C2**
				4-pin micro DC connector	**E57P-18SPN8-Q**	**E57P-18SPC8-Q**
			Shielded (NPN)	2-meter cable	**E57P-18SNN8-C2**	**E57P-18SNC8-C2**
				4-pin micro DC connector	**E57P-18SNN8-Q**	**E57P-18SNC8-Q**
		12 mm (extended range)	Unshielded (PNP)	2-meter cable	**E57P-18UPN12-C2**	**E57P-18UPC12-C2**
				4-pin micro DC connector	**E57P-18UPN12-Q**	**E57P-18UPC12-Q**
			Unshielded (NPN)	2-meter cable	**E57P-18UNN12-C2**	**E57P-18UNC12-C2**
				4-pin micro DC connector	**E57P-18UNN12-Q**	**E57P-18UNC12-Q**

Notes

See listing of compatible connector cables on **Page V8-T3-20**.

① For cable lengths longer than 2 meters, add the number of the desired length in meters to the end of the listed catalog number (for catalog numbers ending with a number, add an **S** and then the length). Examples for a 5-meter cable: E57-18LE12-A becomes E57-18LE12-A**5**; E57LAL12A2 becomes E57LAL12A2**S5**.

Three-Wire Sensors, continued

30 mm

Operating Voltage	Sensing Range (Sn)	Shielding	Connection Type ①	NO Output Catalog Number	NC Output Catalog Number
30 mm Diameter End Sensing					
10–48 Vdc	10 mm (standard range)	Shielded (PNP)	2-meter cable	**E57P-30SPN10-C2**	**E57P-30SPC10-C2**
			4-pin micro DC connector	**E57P-30SPN10-Q**	**E57P-30SPC10-Q**
		Shielded (NPN)	2-meter cable	**E57P-30SNN10-C2**	**E57P-30SNC10-C2**
			4-pin micro DC connector	**E57P-30SNN10-Q**	**E57P-30SNC10-Q**
	15 mm (standard range)	Unshielded (PNP)	2-meter cable	**E57P-30UPN15-C2**	**E57P-30UPC15-C2**
			4-pin micro DC connector	**E57P-30UPN15-Q**	**E57P-30UPC15-Q**
		Unshielded (NPN)	2-meter cable	**E57P-30UNN15-C2**	**E57P-30UNC15-C2**
			4-pin micro DC connector	**E57P-30UNN15-Q**	**E57P-30UNC15-Q**
	15 mm (extended range)	Shielded (PNP)	2-meter cable	**E57P-30SPN15-C2**	**E57P-30SPC15-C2**
			4-pin micro DC connector	**E57P-30SPN15-Q**	**E57P-30SPC15-Q**
		Shielded (NPN)	2-meter cable	**E57P-30SNN15-C2**	**E57P-30SNC15-C2**
			4-pin micro DC connector	**E57P-30SNN15-Q**	**E57P-30SNC15-Q**
	22 mm (extended range)	Unshielded (PNP)	2-meter cable	**E57P-30UPN22-C2**	**E57P-30UPC22-C2**
			4-pin micro DC connector	**E57P-30UPN22-Q**	**E57P-30UPC22-Q**
		Unshielded (NPN)	2-meter cable	**E57P-30UNN22-C2**	**E57P-30UNC22-C2**
			4-pin micro DC connector	**E57P-30UNN22-Q**	**E57P-30UNC22-Q**

Compatible Connector Cables

Standard Cables ①

Micro-Style Straight Female

Current Rating at 600 V	Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number
Micro-Style, Straight Female							
—	DC	4-pin, 4-wire	22 AWG	6.0 ft (2m)	① ② ④ ③ 1-Brown 2-White 3-Blue 4-Black	**CSDS4A4CY2202**	**CSDS4A4RY2202**

Accessories

E57P Performance Sensors

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

Notes

See listing of compatible connector cables on **Page V8-T3-20**.

① For cable lengths longer than 2 meters, add the number of the desired length in meters to the end of the listed catalog number (for catalog numbers ending with a number, add an **S** and then the length). Examples for a 5-meter cable: E57-18LE12-A becomes E57-18LE12-A**5**; E57LAL12A2 becomes E57LAL12A2**S5**.

② For a full selection of connector cables, see **Tab 10**, **section 10.1**.

Technical Data and Specifications

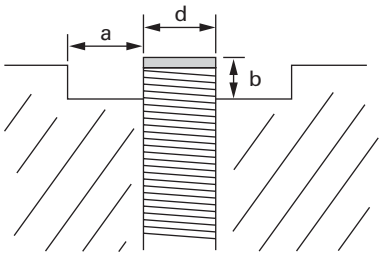
E57P Performance Sensors

Description	Performance Three-Wire DC Sensors
Operating voltage	10–48 Vdc
Output current (continuous)	300 mA
Switching frequency [Hz]	Standard range: 12 mm—Shielded: 2000; Unshielded: 2000 18 mm—Shielded: 1200; Unshielded: 1200 30 mm—Shielded: 600; Unshielded: 500 Extended range: 12 mm—Shielded: 1200; Unshielded: 500 18 mm—Shielded: 300; Unshielded: 300 30 mm—Shielded: 400; Unshielded: 200
Leakage current	<100 µA
Output voltage drop [Vsat]	<2.5 V
Current consumption	<10 mA
Short-circuit protection	Yes (Auto Reset)
Hysteresis [% of Sr]	2–20%
Repeat accuracy	1% shielded, 3% unshielded
Time delay before availability	<200 ms
Output indicator LED	360° amber LED
Operating temperature range	–40 to 70 °C
Ingress protection	IEC IP67, IP69K, UL Type 1, NEMA Type 6P, NEMA Type 4X
Shock	30 g, 11 ms per IEC 68-2-76
Vibration	10 to 55 Hz, 1 mm amplitude
Housing materials	Front face: Ryton Tube: Stainless steel End bells: M12 body: Polycarbonate Cable end bell: Polycarbonate Nuts: Stainless steel
Cable	AWM style 20387 (PVC)

Recommended Mounting Clearances

For unshielded standard range sensors and extended range sensors, clearance must be provided around the sensor when mounting for reliable performance. (“Sn” is the sensing range of the sensor, “d” is the sensor diameter.)

E57P Performance Sensors, Mounting



Type	Shielding	a	b
Standard range	Shielded	0	0
	Unshielded	Cap height	2 x 5n
Extended range	Shielded	0	0
	Unshielded	Cap height	2 x Sn

Note

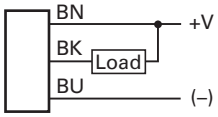
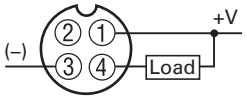
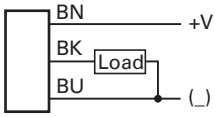
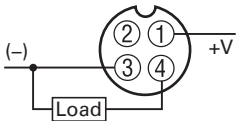
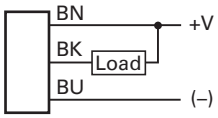
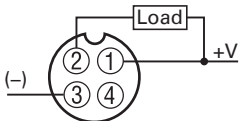
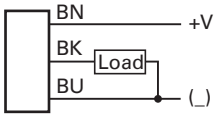
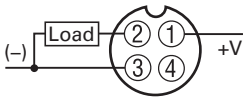
Ryton® is a registered trademark of Phillips Chemical (division of Phillips Petroleum).

① 40–240 Vac at <–4 °F (<–20 °C).

Wiring Diagrams

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

E57P Performance Sensors

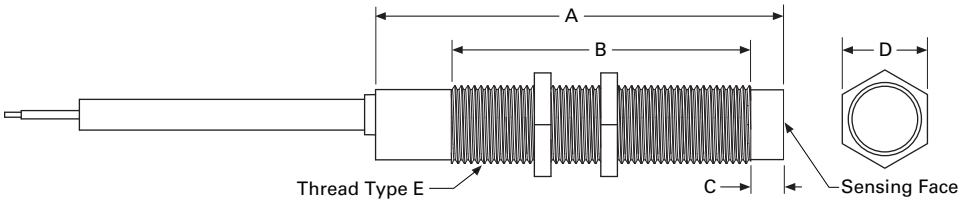
Operating Voltage	Output	Cable Models	Connector Models (Face View Male Shown) Micro
Three-Wire Sensors			
10–48 Vdc	NO (NPN)		
	NO (PNP)		
	NC (NPN)		
	NC (PNP)		

Dimensions

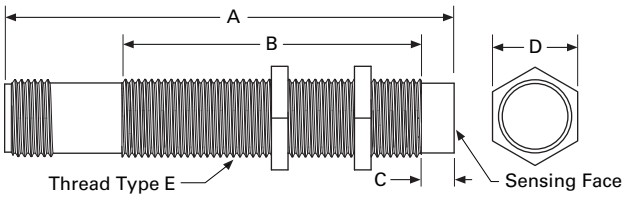
Approximate Dimensions in Inches (mm)

E57P Performance Series Sensors, End Sensing ①

Cable Models



Connector Models



Size	Shielding	Overall Length A	Threaded Length B	Cap Height C	Nut Width D	Thread Size E
Three-Wire DC Sensors—Cable Models						
12 mm	Shielded	2.52 (64.1)	1.98 (50.3)	—	0.67 (16.8)	M12 x 1
	Unshielded	2.52 (64.1)	1.80 (45.8)	0.20 (5.0)	0.67 (16.8)	M12 x 1
18 mm	Shielded	2.59 (65.9)	2.00 (50.9)	—	0.94 (23.8)	M18 x 1
	Unshielded	2.59 (65.9)	1.75 (44.4)	0.28 (7.0)	0.94 (23.8)	M18 x 1
30 mm	Shielded	2.67 (67.7)	1.98 (50.3)	—	1.41 (35.9)	M30 x 1.5
	Unshielded	2.67 (67.7)	1.49 (37.8)	0.51 (13.0)	1.41 (35.9)	M30 x 1.5
Three-Wire DC Sensors—Micro-Connector Models						
12 mm	Shielded	2.70 (68.7)	1.98 (50.3)	—	0.67 (16.8)	M12 x 1
	Unshielded	2.70 (68.7)	1.80 (45.8)	0.20 (5.0)	0.67 (16.8)	M12 x 1
18 mm	Shielded	2.72 (69.2)	2.00 (50.9)	—	0.94 (23.8)	M18 x 1
	Unshielded	2.72 (69.2)	1.75 (44.4)	0.28 (7.0)	0.94 (23.8)	M18 x 1
30 mm	Shielded	2.79 (70.9)	1.98 (50.3)	—	1.41 (35.9)	M30 x 1.5
	Unshielded	2.79 (70.9)	1.49 (37.8)	0.51 (13.0)	1.41 (35.9)	M30 x 1.5

Note

① These dimensions apply to the Performance Series models in this section.

3

E57PS Performance Short Body Sensors

Contents

E57PS Performance Short Body Sensors

Product Description

For demanding sensing applications in areas too small for standard length units, the E57PS Performance Short Body series is an ideal solution as it incorporates the premium features of the E57P series but in a shorter body length. With its stainless steel tubular body, IP69K rating, wide temperature range (down to –40 °C), fast switching speed and laser-etched markings, the E57PS series provides value at a low price point.

Features

- 360° LED indicator
- Stainless steel tube
- 10–48 Vdc operating voltage
- Short-circuit protection
- –40 to 70 °C temperature range
- IP69K environmental rating
- Durable laser-engraved label
- Available in cable and micro-connector styles

Standards and Certifications

- UL Listed, E166051
- UL Tested to Canadian safety standards
- CE
- RoHS Compliant

c UL us LISTED CE RoHS COMPLIANT

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

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

E57PS Performance Short Body Sensors

Three-Wire Sensors

	Operating Voltage	Sensing Range (Sn)	Shielding	Connection Type ①	NO Output Catalog Number	NC Output Catalog Number
12 mm 	**12 mm Diameter**					
	10–48 Vdc	2 mm (standard range)	Shielded (PNP)	2-meter cable	**E57PS-12SPN2-C2**	**E57PS-12SPC2-C2**
				4-pin micro DC connector	**E57PS-12SPN2-Q** ⠿	**E57PS-12SPC2-Q** ⠿
			Shielded (NPN)	2-meter cable	**E57PS-12SNN2-C2**	**E57PS-12SNC2-C2**
				4-pin micro DC connector	**E57PS-12SNN2-Q** ⠿	**E57PS-12SNC2-Q** ⠿
		4 mm (standard range)	Unshielded (PNP)	2-meter cable	**E57PS-12UPN4-C2**	**E57PS-12UPC4-C2**
				4-pin micro DC connector	**E57PS-12UPN4-Q** ⠿	**E57PS-12UPC4-Q** ⠿
			Unshielded (NPN)	2-meter cable	**E57PS-12UNN4-C2**	**E57PS-12UNC4-C2**
				4-pin micro DC connector	**E57PS-12UNN4-Q** ⠿	**E57PS-12UNC4-Q** ⠿
18 mm 	**18 mm Diameter**					
	10–48 Vdc	5 mm (standard range)	Shielded (PNP)	2-meter cable	**E57PS-18SPN5-C2**	**E57PS-18SPC5-C2**
				4-pin micro DC connector	**E57PS-18SPN5-Q** ⠿	**E57PS-18SPC5-Q** ⠿
			Shielded (NPN)	2-meter cable	**E57PS-18SNN5-C2**	**E57PS-18SNC5-C2**
				4-pin micro DC connector	**E57PS-18SNN5-Q** ⠿	**E57PS-18SNC5-Q** ⠿
		8 mm (standard range)	Unshielded (PNP)	2-meter cable	**E57PS-18UPN8-C2**	**E57PS-18UPC8-C2**
				4-pin micro DC connector	**E57PS-18UPN8-Q** ⠿	**E57PS-18UPC8-Q** ⠿
			Unshielded (NPN)	2-meter cable	**E57PS-18UNN8-C2**	**E57PS-18UNC8-C2**
				4-pin micro DC connector	**E57PS-18UNN8-Q** ⠿	**E57PS-18UNC8-Q** ⠿
30 mm 	**30 mm Diameter**					
	10–48 Vdc	10 mm (standard range)	Shielded (PNP)	2-meter cable	**E57PS-30SPN10-C2**	**E57PS-30SPC10-C2**
				4-pin micro DC connector	**E57PS-30SPN10-Q** ⠿	**E57PS-30SPC10-Q** ⠿
			Shielded (NPN)	2-meter cable	**E57PS-30SNN10-C2**	**E57PS-30SNC10-C2**
				4-pin micro DC connector	**E57PS-30SNN10-Q** ⠿	**E57PS-30SNC10-Q** ⠿
		15 mm (standard range)	Unshielded (PNP)	2-meter cable	**E57PS-30UPN15-C2**	**E57PS-30UPC15-C2**
				4-pin micro DC connector	**E57PS-30UPN15-Q** ⠿	**E57PS-30UPC15-Q** ⠿
			Unshielded (NPN)	2-meter cable	**E57PS-30UNN15-C2**	**E57PS-30UNC15-C2**
				4-pin micro DC connector	**E57PS-30UNN15-Q** ⠿	**E57PS-30UNC15-Q** ⠿

Compatible Connector Cables

Standard Cables ②

	Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number
Micro-Style Straight Female 	**Micro-Style, Straight Female**						
	DC	4-pin, 4-wire	22 AWG	6.0 ft (2m)	 1-Brown 2-White 3-Blue 4-Black	**CSDS4A4CY2202**	**CSDS4A4RY2202**

Notes

⠿ See listing of compatible connector cables above.

① 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 E57SAL12T110**S5**.

② For a full selection of connector cables, see **Tab 10**, **section 10.1**.

Accessories

E57PS Performance Short Body Sensors

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

Technical Data and Specifications

E57PS Performance Short Body Sensors

Description	Three-Wire DC Sensors
Operating voltage	10–48 Vdc
Maximum load current	300 mA
Switching frequency [Hz]	12 mm—Shielded: 2000; Unshielded: 2000 18 mm—Shielded: 1200; Unshielded: 1200 30 mm—Shielded: 600; Unshielded: 500
Leakage current	100 µA maximum
Voltage drop	≤2.5 V
Holding current	≤10 mA
Short-circuit protection	Yes (Auto Reset)
Switching hysteresis	2–20% of rated sensing distance
Repeat accuracy	1% shielded, 3% unshielded
Output indicator LED	360° amber LED
Operating temperature	–40 to 158 °F (–40 to 70 °C)
Enclosure ratings	IP67, IP69K; NEMA 4, 4X, 6, 6P
Shock	30 g 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)

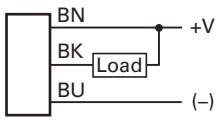
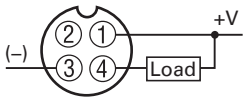
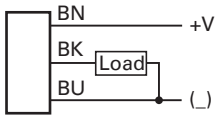
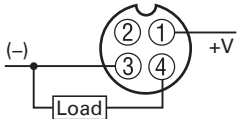
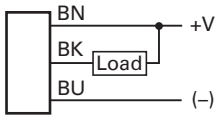
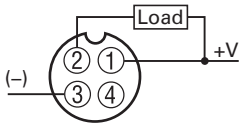
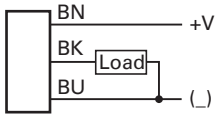
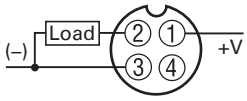
Note

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

Wiring Diagrams

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

E57PS Performance Short Body Sensors

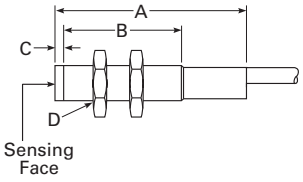
Operating Voltage	Output	Cable Models	Micro-Connector Models (Face View Male Shown)
Three-Wire Sensors			
10–48 Vdc	NO (NPN)		
	NO (PNP)		
	NC (NPN)		
	NC (PNP)		

Dimensions

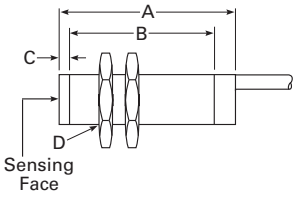
Approximate Dimensions in Inches (mm)

E57PS Performance Short Body Sensors—Cable Models

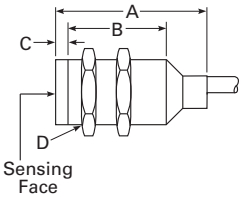
12 mm



18 mm



30 mm

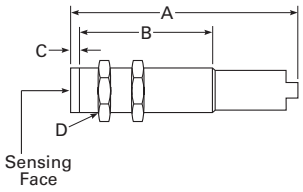


Size	Shielding	Overall Length A	Threaded Length B	Cap Height C	Thread Size D
Three-Wire DC Sensors					
12 mm	Shielded	1.61 (40.9)	1.07 (27.2)	—	M12 x 1
	Unshielded	1.61 (40.9)	0.89 (22.7)	0.20 (5.0)	M12 x 1
18 mm	Shielded	1.77 (44.9)	1.17 (29.8)	—	M18 x 1
	Unshielded	1.77 (44.9)	0.92 (23.3)	0.28 (7.0)	M18 x 1
30 mm	Shielded	1.84 (46.6)	1.15 (29.3)	—	M30 x 1.5
	Unshielded	1.84 (46.6)	0.66 (16.8)	0.51 (13.0)	M30 x 1.5

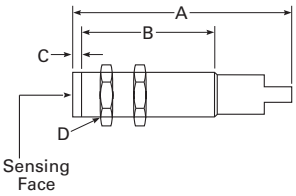
Approximate Dimensions in Inches (mm)

E57PS Performance Short Body Sensors—Micro-Connector Models

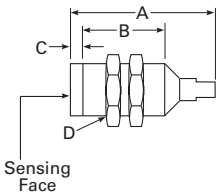
12 mm



18 mm



30 mm



Size	Shielding	Overall Length A	Threaded Length B	Cap Height C	Thread Size D
Three-Wire DC Sensors					
12 mm	Shielded	1.64 (41.5)	1.07 (27.2)	—	M12 x 1
	Unshielded	1.64 (41.5)	0.89 (22.7)	0.20 (5.0)	M12 x 1
18 mm	Shielded	1.59 (40.3)	1.17 (29.8)	—	M18 x 1
	Unshielded	1.59 (40.3)	0.92 (23.3)	0.28 (7.0)	M18 x 1
30 mm	Shielded	1.77 (45.0)	1.15 (29.3)	—	M30 x 1.5
	Unshielded	1.96 (49.7)	0.66 (16.8)	0.51 (13.0)	M30 x 1.5

E57G General Purpose Proximity Sensors

Contents

E57G General Purpose Proximity Sensors

Product Description

For global sensing applications, the E57G General Purpose series is designed for most standard inductive sensing needs. With its stainless steel tubular body, 360 degree visible LED, fast switching speed and laser-etched markings, the E57G series is an ideal cost-effective solution.

Features

- 360° LED indicator
- Stainless steel tube
- 10–30 Vdc operating voltage
- Short-circuit protection
- –25 to 70 °C temperature range
- IP67 environmental rating
- Durable laser-engraved label
- Available in cable and micro-connector styles
- Nickel-brass mounting nuts

Standards and Certifications

- UL Listed, E166051
- UL Tested to Canadian safety standards
- CE
- RoHS Compliant

c UL us LISTED CE RoHS COMPLIANT

⚠ 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

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

E57G General Purpose Proximity Sensors

Three-Wire Sensors

Operating Voltage	Sensing Range	Shielding	Output Type	Connection Type	NO Output Catalog Number	NC Output Catalog Number
12 mm	**12 mm Diameter**					
						
10–30 Vdc	2 mm (standard range)	Shielded	PNP	2-meter cable	**E57G-12SPN2-C2**	**E57G-12SPC2-C2**
				4-pin micro DC connector	**E57G-12SPN2-Q**	**E57G-12SPC2-Q**
			NPN	2-meter cable	**E57G-12SNN2-C2**	**E57G-12SNC2-C2**
				4-pin micro DC connector	**E57G-12SNN2-Q**	**E57G-12SNC2-Q**
	4 mm (standard range)	Unshielded	PNP	2-meter cable	**E57G-12UPN4-C2**	**E57G-12UPC4-C2**
				4-pin micro DC connector	**E57G-12UPN4-Q**	**E57G-12UPC4-Q**
			NPN	2-meter cable	**E57G-12UNN4-C2**	**E57G-12UNC4-C2**
				4-pin micro DC connector	**E57G-12UNN4-Q**	**E57G-12UNC4-Q**
	4 mm (extended range)	Shielded	PNP	2-meter cable	**E57G-12SPN4-C2**	**E57G-12SPC4-C2**
				4-pin micro DC connector	**E57G-12SPN4-Q**	**E57G-12SPC4-Q**
			NPN	2-meter cable	**E57G-12SNN4-C2**	**E57G-12SNC4-C2**
				4-pin micro DC connector	**E57G-12SNN4-Q**	**E57G-12SNC4-Q**
	8 mm (extended range)	Unshielded	PNP	2-meter cable	**E57G-12UPN8-C2**	**E57G-12UPC8-C2**
				4-pin micro DC connector	**E57G-12UPN8-Q**	**E57G-12UPC8-Q**
			NPN	2-meter cable	**E57G-12UNN8-C2**	**E57G-12UNC8-C2**
				4-pin micro DC connector	**E57G-12UNN8-Q**	**E57G-12UNC8-Q**
18 mm	**18 mm Diameter**					
						
10–30 Vdc	5 mm (standard range)	Shielded	PNP	2-meter cable	**E57G-18SPN5-C2**	**E57G-18SPC5-C2**
				4-pin micro DC connector	**E57G-18SPN5-Q**	**E57G-18SPC5-Q**
			NPN	2-meter cable	**E57G-18SNN5-C2**	**E57G-18SNC5-C2**
				4-pin micro DC connector	**E57G-18SNN5-Q**	**E57G-18SNC5-Q**
	8 mm (standard range)	Unshielded	PNP	2-meter cable	**E57G-18UPN8-C2**	**E57G-18UPC8-C2**
				4-pin micro DC connector	**E57G-18UPN8-Q**	**E57G-18UPC8-Q**
			NPN	2-meter cable	**E57G-18UNN8-C2**	**E57G-18UNC8-C2**
				4-pin micro DC connector	**E57G-18UNN8-Q**	**E57G-18UNC8-Q**
	8 mm (extended range)	Shielded	PNP	2-meter cable	**E57G-18SPN8-C2**	**E57G-18SPC8-C2**
				4-pin micro DC connector	**E57G-18SPN8-Q**	**E57G-18SPC8-Q**
			NPN	2-meter cable	**E57G-18SNN8-C2**	**E57G-18SNC8-C2**
				4-pin micro DC connector	**E57G-18SNN8-Q**	**E57G-18SNC8-Q**
	12 mm (extended range)	Unshielded	PNP	2-meter cable	**E57G-18UPN12-C2**	**E57G-18UPC12-C2**
				4-pin micro DC connector	**E57G-18UPN12-Q**	**E57G-18UPC12-Q**
			NPN	2-meter cable	**E57G-18UNN12-C2**	**E57G-18UNC12-C2**
				4-pin micro DC connector	**E57G-18UNN12-Q**	**E57G-18UNC12-Q**

Note

See listing of compatible connector cables on **Page V8-T3-31**.

Three-Wire Sensors, continued

30 mm

Operating Voltage	Sensing Range	Shielding	Output Type	Connection Type	NO Output Catalog Number	NC Output Catalog Number
30 mm Diameter						
10–30 Vdc	10 mm (standard range)	Shielded	PNP	2-meter cable	**E57G-30SPN10-C2**	**E57G-30SPC10-C2**
				4-pin micro DC connector	**E57G-30SPN10-Q**	**E57G-30SPC10-Q**
			NPN	2-meter cable	**E57G-30SNN10-C2**	**E57G-30SNC10-C2**
				4-pin micro DC connector	**E57G-30SNN10-Q**	**E57G-30SNC10-Q**
	15 mm (standard range)	Unshielded	PNP	2-meter cable	**E57G-30UPN15-C2**	**E57G-30UPC15-C2**
				4-pin micro DC connector	**E57G-30UPN15-Q**	**E57G-30UPC15-Q**
			NPN	2-meter cable	**E57G-30UNN15-C2**	**E57G-30UNC15-C2**
				4-pin micro DC connector	**E57G-30UNN15-Q**	**E57G-30UNC15-Q**
	15 mm (extended range)	Shielded	PNP	2-meter cable	**E57G-30SPN15-C2**	**E57G-30SPC15-C2**
				4-pin micro DC connector	**E57G-30SPN15-Q**	**E57G-30SPC15-Q**
			NPN	2-meter cable	**E57G-30SNN15-C2**	**E57G-30SNC15-C2**
				4-pin micro DC connector	**E57G-30SNN15-Q**	**E57G-30SNC15-Q**
	22 mm (extended range)	Unshielded	PNP	2-meter cable	**E57G-30UPN22-C2**	**E57G-30UPC22-C2**
				4-pin micro DC connector	**E57G-30UPN22-Q**	**E57G-30UPC22-Q**
			NPN	2-meter cable	**E57G-30UNN22-C2**	**E57G-30UNC22-C2**
				4-pin micro DC connector	**E57G-30UNN22-Q**	**E57G-30UNC22-Q**

Compatible Connector Cables

Standard Cables ①

Micro-Style Straight Female

Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number
Micro-Style, Straight Female						
DC	4-pin, 3-wire	22 AWG	6.0 ft (2m)	① ② ④ ③ 1-Brown 2-No Wire 3-Blue 4-Black	**CSDS4A3CY2202**	**CSDS4A3RY2202**

Accessories

E57G General Purpose Proximity Sensors

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

Notes

⠿ See listing of compatible connector cables on **Page V8-T3-31**.

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

Technical Data and Specifications

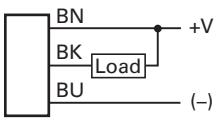
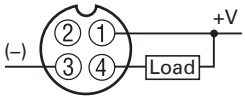
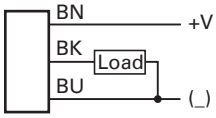
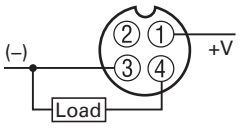
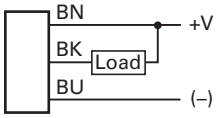
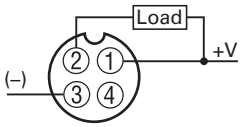
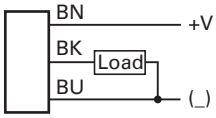
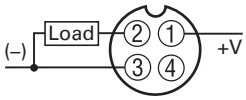
E57G General Purpose Proximity Sensors

Description	Three-Wire DC Sensors
Operating voltage	10–30 Vdc
Output current (continuous)	100 mA
Switching frequency [Hz]	Standard range: 12 mm—Shielded: 2000; Unshielded: 2000 18 mm—Shielded: 1200; Unshielded: 1200 30 mm—Shielded: 600; Unshielded: 500 Extended range: 12 mm—Shielded: 1200; Unshielded: 500 18 mm—Shielded: 300; Unshielded: 300 30 mm—Shielded: 400; Unshielded: 200
Leakage current	<100 µA
Output voltage drop [Vsat]	<2.5 V
Current consumption	<10 mA
Short-circuit protection	Yes (Auto Reset)
Hysteresis [% of Sr]	2–20%
Repeat accuracy	1% shielded, 3% unshielded
Time delay before availability	<200 ms
Output indicator LED	360° amber LED
Operating temperature range	–25 to 70 °C
Ingress protection	IEC IP67, UL Type 1
Mechanical shock	IEC 60947-5-2 30 G half-sine wave, 11 mS
Vibration	IEC 60947-5-2 10–55 Hz, 1 mm amplitude
Housing materials	Front face: Ryton Tube: stainless steel End bells: M12 body: Polycarbonate Cable end bell: Polycarbonate Nuts: Ni-Brass
Cable	AWM style 20387 (PVC)

Wiring Diagrams

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

E57G General Purpose Proximity Sensors

Operating Voltage	Output	Cable Models	Connector Models (Face View Male Shown) Micro
Three-Wire Sensors			
10–30 Vdc	NO (NPN)		
	NO (PNP)		
	NC (NPN)		
	NC (PNP)		

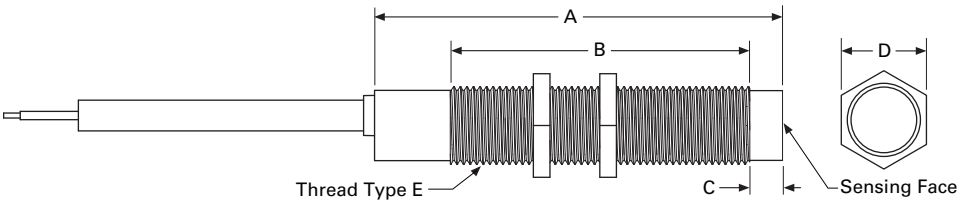
Dimensions

Approximate Dimensions in Inches (mm)

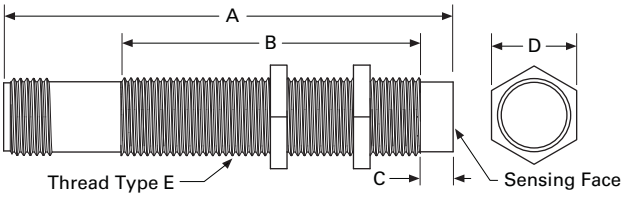
E57G General Purpose Proximity Sensors

3

Cable Models



Connector Models



Size	Shielding	Overall Length A	Threaded Length B	Cap Height C	Nut Width D	Thread Size E
Three-Wire DC Sensors—Cable Models						
12 mm	Shielded	2.52 (64.1)	1.98 (50.3)	—	0.67 (16.8)	M12 x 1
	Unshielded	2.52 (64.1)	1.80 (45.8)	0.20 (5.0)	0.67 (16.8)	M12 x 1
18 mm	Shielded	2.59 (65.9)	2.00 (50.9)	—	0.94 (23.8)	M18 x 1
	Unshielded	2.59 (65.9)	1.75 (44.4)	0.28 (7.0)	0.94 (23.8)	M18 x 1
30 mm	Shielded	2.67 (67.7)	1.98 (50.3)	—	1.41 (35.9)	M30 x 1.5
	Unshielded	2.67 (67.7)	1.49 (37.8)	0.51 (13.0)	1.41 (35.9)	M30 x 1.5
Three-Wire DC Sensors—Micro-Connector Models						
12 mm	Shielded	2.70 (68.7)	1.98 (50.3)	—	0.67 (16.8)	M12 x 1
	Unshielded	2.70 (68.7)	1.80 (45.8)	0.20 (5.0)	0.67 (16.8)	M12 x 1
18 mm	Shielded	2.72 (69.2)	2.00 (50.9)	—	0.94 (23.8)	M18 x 1
	Unshielded	2.72 (69.2)	1.75 (44.4)	0.28 (7.0)	0.94 (23.8)	M18 x 1
30 mm	Shielded	2.79 (70.9)	1.98 (50.3)	—	1.41 (35.9)	M30 x 1.5
	Unshielded	2.79 (70.9)	1.49 (37.8)	0.51 (13.0)	1.41 (35.9)	M30 x 1.5

E57 Two-Wire (AC, AC/DC, DC) Proximity Sensors

Contents

3

E57 Two-Wire (AC, AC/DC, DC) Proximity Sensors

Product Description

Eaton carries several options for your sensing needs in the E57 two-wire family. The stainless steel models are available in a standard length or short body, while available in AC or AC/DC configurations. The nickel-brass body models are available in standard length and either AC or DC two-wire configurations.

All of these are available in NPN or PNP with cable connections or micro connectors. The stainless steel standard length models are also available with mini connectors.

The stainless steel models in both lengths have 360 degree LEDs while the nickel-brass models have a single LED indicator.

Extended sensing ranges are also available in the stainless steel and nickel-brass standard length models, while shielded and unshielded models are offered throughout the E57 two-wire sensor products.

Standards and Certifications

- Stainless Steel:
  - UL Listed, E166051
  - UL Tested to Canadian safety standards
  - CE (AC/DC only)
  - RoHS Compliant
- Nickel-Brass:
  - CSA Certified, 224447
  - Products certified by CSA for US
  - CE (DC only)
  - RoHS Compliant

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.

Highlighted Comparisons

Description	Stainless Steel	Stainless Steel Short Body	Nickel-Brass
Current ratings	250–500 mA	250–500 mA	200 mA
Enclosure ratings	NEMA 4, 4K, 6, 6P, 12, 13, IEC IP6, IP69K7	NEMA 4, 4K, 6, 6P, 12, 13, IEC IP67	IP67, IP69K
Operating temperature	–25 to 70 °C	–25 to 70 °C	–25 to 70 °C
Indicator	360° LED	360° LED	LED
Increased shock and vibration ratings	Yes	Yes	No

For the most current information on this product, visit our Web site: 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.

Product Selection

Stainless Steel Body (Standard Length)

Two-Wire Sensors

Operating Voltage	Sensing Range (Sn)	Shielding	Connection Type ①	NO Output Catalog Number	NC Output Catalog Number
12 mm 	**12 mm Diameter End Sensing**				
20–250 Vac	2 mm (standard range)	Shielded	2-meter cable	**E57LAL12A2**	**E57LBL12A2**
			3-pin micro AC connector	**E57LAL12A2SA**	**E57LBL12A2SA**
			3-pin micro AC pigtail connector	**E57LAL12A2SP**	**E57LBL12A2SP**
	4 mm (standard range)	Unshielded	2-meter cable	**E57LAL12A2E**	**E57LBL12A2E**
			3-pin micro AC connector	**E57LAL12A2EA**	**E57LBL12A2EA**
			3-pin micro AC pigtail connector	**E57LAL12A2EP**	**E57LBL12A2EP**
20–132 Vac	6 mm (extended range)	Semi-shielded	2-meter cable	**E57-12LE06-A**	**E57-12LE06-A1**
			3-pin micro AC connector	**E57-12LE06-AA**	**E57-12LE06-A1A**
			3-pin micro AC pigtail connector	**E57-12LE06-AP**	—
	10 mm (extended range)	Non-embeddable	2-meter cable	**E57-12LE10-A**	**E57-12LE10-A1**
			3-pin micro AC connector	**E57-12LE10-AA**	**E57-12LE10-A1A**
			3-pin micro AC pigtail connector	**E57-12LE10-AP**	**E57-12LE10-A1P**
40–250 Vac 50/60 Hz② 20–250 Vdc	2 mm (standard range)	Shielded	2-meter cable	**E57SAL12A2**	**E57SBL12A2**
			3-pin micro AC connector	**E57SAL12A2SA**	**E57SBL12A2SA**
			3-pin mini-connector	**E57MAL12A2B1**	—
	4 mm (standard range)	Unshielded	2-meter cable	**E57SAL12A2E**	**E57SBL12A2E**
			3-pin micro AC connector	**E57SAL12A2EA**	**E57SBL12A2EA**
18 mm 	**18 mm Diameter End Sensing**				
20–250 Vac	5 mm (standard range)	Shielded	2-meter cable	**E57LAL18A2**	**E57LBL18A2**
			3-pin micro AC connector	**E57LAL18A2SA**	**E57LBL18A2SA**
			3-pin micro AC pigtail connector	**E57LAL18A2SP**	**E57LBL18A2SP**
			3-pin mini-connector	**E57MAL18A2B1**	**E57MBL18A2B1**
	8 mm (standard range)	Unshielded	2-meter cable	**E57LAL18A2E**	**E57LBL18A2E**
			3-pin micro AC connector	**E57LAL18A2EA**	**E57LBL18A2EA**
			3-pin micro AC pigtail connector	**E57LAL18A2EP**	**E57LBL18A2EP**
			3-pin mini-connector	**E57MAL18A2EB1**	**E57MBL18A2EB1**
20–132 Vac	12 mm (extended range)	Semi-shielded	2-meter cable	**E57-18LE12-A**	**E57-18LE12-A1**
			3-pin micro AC connector	**E57-18LE12-AA**	**E57-18LE12-A1A**
			3-pin micro AC pigtail connector	**E57-18LE12-AP**	**E57-18LE12-A1P**
			3-pin mini-connector	**E57-18LE12-AB**	**E57-18LE12-A1B**
	18 mm (extended range)	Non-embeddable	2-meter cable	**E57-18LE20-A**	**E57-18LE20-A1**
			3-pin micro AC connector	**E57-18LE20-AA**	**E57-18LE20-A1A**
			3-pin micro AC pigtail connector	**E57-18LE20-AP**	**E57-18LE20-A1P**
			3-pin mini-connector	**E57-18LE20-AB**	**E57-18LE20-A1B**
40–250 Vac 50/60 Hz② 20–250 Vdc	5 mm (standard range)	Shielded	2-meter cable	**E57SAL18A2**	**E57SBL18A2**
			3-pin micro AC connector	**E57SAL18A2SA**	**E57SBL18A2SA**
	8 mm (standard range)	Unshielded	2-meter cable	**E57SAL18A2E**	**E57SBL18A2E**
			3-pin micro AC connector	**E57SAL18A2EA**	**E57SBL18A2EA**

Notes

See listing of compatible connector cables on **Page V8-T3-40**.

① For cable lengths longer than 2 meters, add the number of the desired length in meters to the end of the listed catalog number (for catalog numbers ending with a number, add an **S** and then the length). Examples for a 5-meter cable: E57-18LE12-A becomes E57-18LE12-A**5**; E57LAL12A2 becomes E57LAL12A2**S5**.

② Avoid wiring these AC/DC models in series as the sensors may not perform reliably. Contact Eaton's Applications Engineering at 1-800-426-9184 with questions.

Stainless Steel Body (Standard Length)

Two-Wire Sensors, continued

Operating Voltage	Sensing Range (Sn)	Shielding	Connection Type ①	NO Output Catalog Number	NC Output Catalog Number
Right Angle	**18 mm Diameter Right Angle Sensing**				
					
20–250 Vac	5 mm	Shielded	2-meter cable	**E57RAL18A2**	**E57RBL18A2**
			3-pin micro AC connector	**E57RAL18A2SA**	**E57RBL18A2SA**
			3-pin micro AC pigtail connector	**E57RAL18A2SP**	**E57RBL18A2SP**
			3-pin mini-connector	**E57RAL18A2B1**	**E57RBL18A2B1**
	8 mm	Unshielded	2-meter cable	**E57RAL18A2E**	**E57RBL18A2E**
			3-pin micro AC connector	**E57RAL18A2EA**	**E57RBL18A2EA**
			3-pin micro AC pigtail connector	**E57RAL18A2EP**	**E57RBL18A2EP**
			3-pin mini-connector	**E57RAL18A2EB1**	**E57RBL18A2EB1**
30 mm	**30 mm Diameter End Sensing**				
					
20–250 Vac	10 mm (standard range)	Shielded	2-meter cable	**E57LAL30A2**	**E57LBL30A2**
			3-pin micro AC connector	**E57LAL30A2SA**	**E57LBL30A2SA**
			3-pin micro AC pigtail connector	**E57LAL30A2SP**	**E57LBL30A2SP**
			3-pin mini-connector	**E57MAL30A2B1**	**E57MBL30A2B1**
	15 mm (standard range)	Unshielded	2-meter cable	**E57LAL30A2E**	**E57LBL30A2E**
			3-pin micro AC connector	**E57LAL30A2EA**	**E57LBL30A2EA**
			3-pin micro AC pigtail connector	**E57LAL30A2EP**	**E57LBL30A2EP**
			3-pin mini-connector	**E57MAL30A2EB1**	**E57MBL30A2EB1**
20–132 Vac	22 mm (extended range)	Semi-shielded	2-meter cable	**E57-30LE22-A**	**E57-30LE22-A1**
			3-pin micro AC connector	**E57-30LE22-AA**	**E57-30LE22-A1A**
			3-pin micro AC pigtail connector	**E57-30LE22-AP**	**E57-30LE22-A1P**
			3-pin mini-connector	**E57-30LE22-AB**	**E57-30LE22-A1B**
40–250 Vac 50/60 Hz② 20–250 Vdc	10 mm (standard range)	Shielded	2-meter cable	**E57SAL30A2**	**E57SBL30A2**
			3-pin micro AC connector	**E57SAL30A2SA**	**E57SBL30A2SA**
	15 mm (standard range)	Unshielded	2-meter cable	**E57SAL30A2E**	**E57SBL30A2E**
			3-pin micro AC connector	**E57SAL30A2EA**	**E57SBL30A2EA**

Notes

See listing of compatible connector cables on **Page V8-T3-40**.

① For cable lengths longer than 2 meters, add the number of the desired length in meters to the end of the listed catalog number (for catalog numbers ending with a number, add an **S** and then the length). Examples for a 5-meter cable: E57-18LE12-A becomes E57-18LE12-A**5**; E57LAL12A2 becomes E57LAL12A2**S5**.

② Avoid wiring these AC/DC models in series as the sensors may not perform reliably. Contact Eaton's Applications Engineering at 1-800-426-9184 with questions.

Stainless Steel Short Body

Two-Wire Sensors

Operating Voltage	Sensing Range (Sn)	Shielding	Connection Type ①	NO Output Catalog Number	NC Output Catalog Number
12 mm					
					
12 mm Diameter					
20–250 Vac	2 mm	Shielded	2-meter cable	**E57SAL12A4**	**E57SBL12A4**
			3-pin micro AC connector	**E57SAL12A4SA** ⓐ	**E57SBL12A4SA** ⓐ
	4 mm	Unshielded	2-meter cable	**E57SAL12A4E**	**E57SBL12A4E**
			3-pin micro AC connector	**E57SAL12A4EA** ⓐ	**E57SBL12A4EA** ⓐ
40–250 Vac 50/60 Hz② 20–250 Vdc	2 mm	Shielded	2-meter cable	**E57SAL12A2**	**E57SBL12A2**
			3-pin micro AC connector	**E57SAL12A2SA** ⓐ	**E57SBL12A2SA** ⓐ
	4 mm	Unshielded	2-meter cable	**E57SAL12A2E**	**E57SBL12A2E**
			3-pin micro AC connector	**E57SAL12A2EA** ⓐ	**E57SBL12A2EA** ⓐ
18 mm					
					
18 mm Diameter					
20–250 Vac	5 mm	Shielded	2-meter cable	**E57SAL18A4**	**E57SBL18A4**
			3-pin micro AC connector	**E57SAL18A4SA** ⓐ	**E57SBL18A4SA** ⓐ
	8 mm	Unshielded	2-meter cable	**E57SAL18A4E**	**E57SBL18A4E**
			3-pin micro AC connector	**E57SAL18A4EA** ⓐ	**E57SBL18A4EA** ⓐ
40–250 Vac 50/60 Hz② 20–250 Vdc	5 mm	Shielded	2-meter cable	**E57SAL18A2**	**E57SBL18A2**
			3-pin micro AC connector	**E57SAL18A2SA** ⓐ	**E57SBL18A2SA** ⓐ
	8 mm	Unshielded	2-meter cable	**E57SAL18A2E**	**E57SBL18A2E**
			3-pin micro AC connector	**E57SAL18A2EA** ⓐ	**E57SBL18A2EA** ⓐ
30 mm					
					
30 mm Diameter					
20–250 Vac	10 mm	Shielded	2-meter cable	**E57SAL30A4**	**E57SBL30A4**
			3-pin micro AC connector	**E57SAL30A4SA** ⓐ	**E57SBL30A4SA** ⓐ
	15 mm	Unshielded	2-meter cable	**E57SAL30A4E**	**E57SBL30A4E**
			3-pin micro AC connector	**E57SAL30A4EA** ⓐ	**E57SBL30A4EA** ⓐ
40–250 Vac 50/60 Hz② 20–250 Vdc	10 mm	Shielded	2-meter cable	**E57SAL30A2**	**E57SBL30A2**
			3-pin micro AC connector	**E57SAL30A2SA** ⓐ	**E57SBL30A2SA** ⓐ
	15 mm	Unshielded	2-meter cable	**E57SAL30A2E**	**E57SBL30A2E**
			3-pin micro AC connector	**E57SAL30A2EA** ⓐ	**E57SBL30A2EA** ⓐ

Notes

ⓐ See listing of compatible connector cables on **Page V8-T3-40**.

① 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 E57SAL12T110**S5**.

② Avoid wiring these AC/DC models in series as the sensors may not perform reliably. Contact Eaton's Applications Engineering at 1-800-426-9184 with questions.

Nickel-Brass Body

Two-Wire Sensors

	Operating Voltage	Sensing Range	Shielding	Output Type	Connection Type	NO Output Catalog Number	NC Output Catalog Number
12 mm 	**12 mm Diameter**						
	20–250 Vac	2 mm	Shielded	—	2-meter cable	**E57-12GS02-A**	**E57-12GS02-A1**
					3-pin micro AC connector	**E57-12GS02-AAB** (1)	**E57-12GS02-A1AB** (1)
		4 mm	Unshielded	—	2-meter cable	**E57-12GU04-A**	**E57-12GU04-A1**
					3-pin micro AC connector	**E57-12GU04-AAB** (1)	**E57-12GU04-A1AB** (1)
	10–30 Vdc	2 mm	Shielded	NPN/PNP	2-meter cable	**E57-12GS02-D**	**E57-12GS02-D1**
					4-pin micro DC connector	**E57-12GS02-DDB** (2)	**E57-12GS02-D1DB** (2)
		4 mm	Unshielded	NPN/PNP	2-meter cable	**E57-12GU04-D**	**E57-12GU04-D1**
					4-pin micro DC connector	**E57-12GU04-DDB** (2)	**E57-12GU04-D1DB** (2)
		8 mm (extended range)		NPN/PNP	2-meter cable	**E57-12GE08-D**	**E57-12GE08-D1**
					4-pin micro DC connector	**E57-12GE08-DDB** (2)	**E57-12GE08-D1DB** (2)
18 mm 	**18 mm Diameter**						
	20–250 Vac	5 mm	Shielded	—	2-meter cable	**E57-18GS05-A**	**E57-18GS05-A1**
					3-pin micro AC connector	**E57-18GS05-AAB** (1)	**E57-18GS05-A1AB** (1)
		8 mm	Unshielded	—	2-meter cable	**E57-18GU08-A**	**E57-18GU08-A1**
					3-pin micro AC connector	**E57-18GU08-AAB** (1)	**E57-18GU08-A1AB** (1)
		16 mm			3-pin micro AC connector	**E57-18GE16-AAB** (1)	**E57-18GE16-A1AB** (1)
	10–30 Vdc	5 mm	Shielded	NPN/PNP	2-meter cable	**E57-18GS05-D**	**E57-18GS05-D1**
					4-pin micro DC connector	**E57-18GS05-DDB** (2)	**E57-18GS05-D1DB** (2)
		8 mm	Unshielded	NPN/PNP	2-meter cable	**E57-18GU08-D**	**E57-18GU08-D1**
					4-pin micro DC connector	**E57-18GU08-DDB** (2)	**E57-18GU08-D1DB** (2)
		16 mm (extended range)		NPN/PNP	2-meter cable	**E57-18GE16-D**	**E57-18GE16-D1**
					4-pin micro DC connector	**E57-18GE16-DDB** (2)	**E57-18GE16-D1DB** (2)
30 mm 	**30 mm Diameter**						
	20–250 Vac	10 mm	Shielded	—	2-meter cable	**E57-30GS10-A**	**E57-30GS10-A1**
					3-pin micro AC connector	**E57-30GS10-AAB** (1)	**E57-30GS10-A1AB** (1)
		15 mm	Unshielded	—	2-meter cable	**E57-30GU15-A**	**E57-30GU15-A1**
					3-pin micro AC connector	**E57-30GU15-AAB** (1)	**E57-30GU15-A1AB** (1)
	10–30 Vdc	10 mm	Shielded	NPN/PNP	2-meter cable	**E57-30GS10-D**	**E57-30GS10-D1**
					4-pin micro DC connector	**E57-30GS10-DDB** (2)	**E57-30GS10-D1DB** (2)
		15 mm	Unshielded	NPN/PNP	2-meter cable	**E57-30GU15-D**	**E57-30GU15-D1**
					4-pin micro DC connector	**E57-30GU15-DDB** (2)	**E57-30GU15-D1DB** (2)
		25 mm (extended range)		NPN/PNP	2-meter cable	**E57-30GE25-D**	**E57-30GE25-D1**
					4-pin micro DC connector	**E57-30GE25-DDB** (2)	**E57-30GE25-D1DB** (2)

Note

(1) (2) See listing of compatible connector cables on **Page V8-T3-40**.

Compatible Connector Cables

Standard Cables ①

Micro-Style Straight Female

Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number
Micro-Style, Straight Female						
AC	3-pin, 3-wire	22 AWG	6.0 ft (2m)	② ③ ① 1-Green 2-Red/Black 3-Red/White	**CSAS3F3CY2202**	**CSAS3F3RY2202**

Accessories

E57 Two-Wire Proximity Sensors

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

Note

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

Technical Data and Specifications

Stainless Steel Body

Description	Two-Wire AC Sensors	Two-Wire AC/DC Sensors	
		AC Operation	DC Operation
Operating voltage	40–250 Vac	40–250 Vac	20–250 Vdc
Maximum load current	250 mA	200 mA	200 mA
Switching frequency	20 Hz	60 Hz	60 Hz
Leakage current	1.7 mA maximum at 70 °C	1.7V mA maximum at 120 Vac	≤2.0 mA
Voltage drop	7V maximum	≤4 V at >25 mA	12 V at <10 mA
Holding current	5 mA minimum	5 mA minimum	5 mA maximum
Protection	—	Resettable short circuit; overload protection	Resettable short circuit; overload protection
Switching hysteresis	2–20% of rated sensing distance	2–20% of rated sensing distance	2–20% of rated sensing distance
Repeat accuracy	<3% sensing distance	<3% sensing distance	<3% sensing distance
Output indicator LED	360° viewable LED	360° viewable LED	360° viewable LED
Operating temperature	–13 to 158 °F (–25 to 70 °C) ①	–13 to 158 °F (–25 to 70 °C) ①	–13 to 158 °F (–25 to 70 °C) ①
Enclosure ratings	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67)	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67)	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67)
Shock	30 g sine wave, 11 ms per IEC68-2-76	30 g sine wave, 11 ms per IEC68-2-76	30 g sine wave, 11 ms per IEC68-2-76
Vibration	10 to 55 Hz, 1 mm amplitude	10 to 55 Hz, 1 mm amplitude	10 to 55 Hz, 1 mm amplitude
Material of construction	Stainless steel, polycarbonate end bells, Ryton® front cap	Stainless steel, polycarbonate end bells, Ryton® front cap	Stainless steel, polycarbonate end bells, Ryton® front cap
Cable	AWM Style 20387 (PVC)	AWM Style 20387 (PVC)	AWM Style 20387 (PVC)

Notes

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

① 240 Vac operation is limited to less than 122 °F (50 °C) in two-wire AC/DC models.

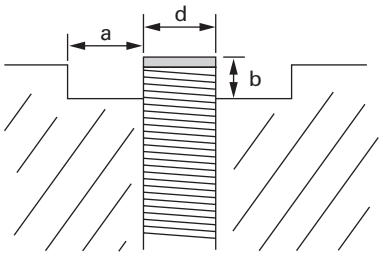
Nickel-Brass Body

Description	Two-Wire AC Sensors	Two-Wire DC Sensors
Operating voltage	20–250 Vac	10–30 Vdc
OFF-state leakage	<1.8 mA	<0.8 mA
Maximum load current	200 mA	100 mA
Minimum load current	5 mA	3 mA
Surge current	5 A (20 ms)	—
Voltage drop	<8 Vac at 400 mA	<6 V
Switching frequency		
8 mm diameter	—	—
12 mm diameter	25 Hz	1 kHz (shielded); 1 kHz (unshielded)
18 mm diameter	25 Hz	1 kHz (shielded); 500 Hz (unshielded)
30 mm diameter	25 Hz	500 Hz (shielded); 200 Hz (unshielded)
Short-circuit protection	No	Yes
Overload trip point	—	>120 mA
Time delay before availability	—	—
Transient protection	—	2 kV, 1 ms, 1 kohm
Repeat accuracy	Shielded: <1.0%/Unshielded: <3.0% (Sr)	<2.0% (Sr)
Switching hysteresis	<15%	<15%
Operating temperature	–13 to 158 °F (–25 to 70 °C) (32 to 140 °F [0 to 60 °C] for all extended range models)	–13 to 158 °F (–25 to 70 °C) (32 to 140 °F [0 to 60 °C] for all extended range models)
Temperature drift	<10% (Sr)	<10% (Sr)
Protection	IP67, IP69K	IP67, IP69K
Housing material	Nickel plated brass (stainless steel for 8 mm diameter, nano-connector models)	Nickel plated brass (stainless steel for 8 mm diameter, nano-connector models)
Cable	PVC jacket, 2-meter length	PVC jacket, 2-meter length

Recommended Mounting Clearances

For unshielded standard range sensors and extended range sensors, clearance must be provided around the sensor when mounting for reliable performance. ("Sn" is the sensing range of the sensor, "d" is the sensor diameter.)

E57 Premium Sensors, Mounting

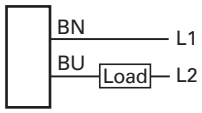
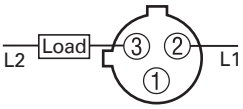
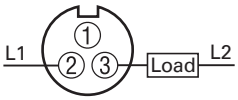
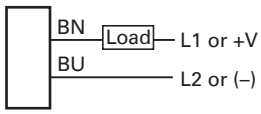
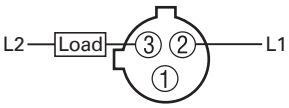
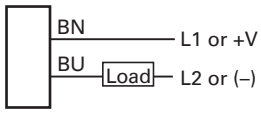
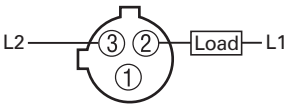


Type	Shielding	a	b
Standard range	Shielded	0	0
	Unshielded	Cap height	2 x 5n
Extended range	Semi-shielded	d	Sn
	Non-embeddable	Cap height	2 x Sn

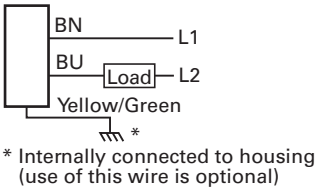
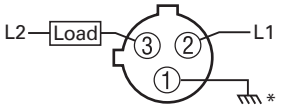
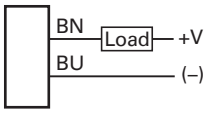
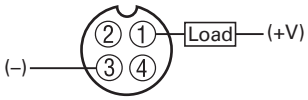
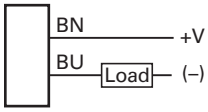
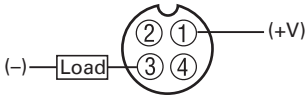
Wiring Diagrams

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

Stainless Steel Body

Operating Voltage	Output	Cable Models	Connector Models (Face View Male Shown) Micro	Mini
Two-Wire Sensors				
20–250 Vac/dc and AC-only AC wiring example	NO and NC			
20–250 Vac/dc DC wiring example	NO and NC (NPN)			—
	NO and NC (PNP)			—

Nickel-Brass Body

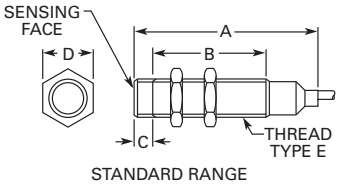
Operating Voltage	Output	Cable Models	Connector Models (Face View Male Shown) Micro
Two-Wire Sensors			
20–250 Vac	NO	 * Internally connected to housing (use of this wire is optional)	 * Internally connected to housing (use of this wire is optional)
10–30 Vdc	NO (NPN)		
	NO (PNP)		

Dimensions

Approximate Dimensions in Inches (mm)

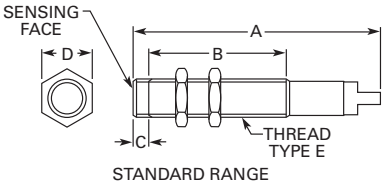
Stainless Steel Body (Standard Length)

Cable Models



STANDARD RANGE

Connector Models



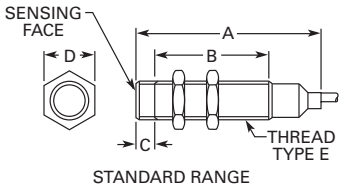
STANDARD RANGE

Size	Shielding	Overall Length A	Threaded Length B	Cap Height C	Nut Width D	Thread Size E
Two-Wire AC Sensors—Cable Models						
12 mm	Shielded	2.46 (62.4)	1.98 (50.3)	—	0.67 (16.8)	M12 x 1
	Semi-shielded	2.87 (72.8)	2.28 (57.9)	0.06 (1.62)	0.67 (16.8)	M12 x 1
	Unshielded	2.87 (72.7)	1.98 (50.3)	0.36 (9.14)	0.67 (16.8)	M12 x 1
18 mm	Shielded	2.54 (64.5)	2.00 (50.9)	—	0.94 (23.8)	M18 x 1
	Semi-shielded	2.60 (66.1)	1.90 (48.2)	0.10 (2.54)	0.94 (23.8)	M18 x 1
	Unshielded	2.60 (66.0)	1.47 (37.2)	0.56 (14.1)	0.94 (23.8)	M18 x 1
30 mm	Shielded	2.73 (69.3)	1.98 (50.3)	—	1.41 (35.9)	M30 x 1.5
	Semi-shielded	2.67 (67.8)	1.90 (48.2)	0.13 (3.30)	1.41 (35.9)	M30 x 1.5
	Unshielded	2.73 (69.3)	1.49 (37.8)	0.52 (13.26)	1.41 (35.9)	M30 x 1.5
Two-Wire AC Sensors—Micro-Connector Models						
12 mm	Shielded	2.69 (68.4)	1.98 (50.3)	—	0.67 (16.8)	M12 x 1
	Semi-shielded	3.04 (77.2)	2.28 (57.9)	0.06 (1.62)	0.67 (16.8)	M12 x 1
	Unshielded	3.06 (77.7)	1.98 (50.3)	0.36 (9.14)	0.36 (9.14)	M12 x 1
18 mm	Shielded	2.72 (69.06)	2.00 (50.9)	—	0.94 (23.8)	M18 x 1
	Semi-shielded	2.72 (69.1)	1.90 (48.2)	0.10 (2.54)	0.94 (23.8)	M18 x 1
	Unshielded	2.74 (69.4)	1.47 (37.2)	0.56 (14.1)	0.94 (23.8)	M18 x 1
30 mm	Shielded	2.91 (73.8)	1.98 (50.3)	—	1.41 (35.9)	M30 x 1.5
	Semi-shielded	2.78 (70.6)	1.90 (48.2)	0.13 (3.30)	1.41 (35.9)	M30 x 1.5
	Unshielded	2.91 (73.8)	1.49 (37.8)	0.52 (13.26)	1.41 (35.9)	M30 x 1.5

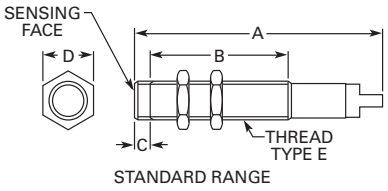
Approximate Dimensions in Inches (mm)

Stainless Steel Body (Standard Length)

Cable Models, continued



Connector Models, continued

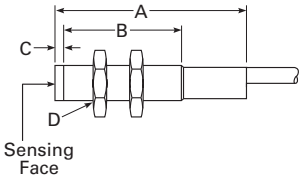


Size	Shielding	Overall Length A	Threaded Length B	Cap Height C	Nut Width D	Thread Size E
Two-Wire AC/DC Sensors—Cable Models						
12 mm	Shielded	2.45 (62.4)	1.98 (50.3)	—	0.67 (16.8)	M12 x 1
	Unshielded	2.45 (62.4)	1.80 (45.8)	0.20 (5)	0.67 (16.8)	M12 x 1
18 mm	Shielded	2.54 (64.5)	2.00 (50.9)	—	0.94 (23.8)	M18 x 1
	Unshielded	2.54 (64.5)	1.75 (44.4)	0.28 (7)	0.94 (23.8)	M18 x 1
30 mm	Shielded	2.72 (69.3)	2.12 (53.8)	—	1.41 (35.9)	M30 x 1.5
	Unshielded	2.72 (69.3)	1.63 (41.4)	0.52 (13.26)	1.41 (35.9)	M30 x 1.5
Two-Wire AC/DC Sensors—Micro-Connector Models						
12 mm	Shielded	2.69 (68.4)	1.98 (50.3)	—	0.67 (16.8)	M12 x 1
	Unshielded	2.69 (68.4)	1.80 (45.8)	0.20 (5)	0.67 (16.8)	M12 x 1
18 mm	Shielded	2.72 (69.06)	2.00 (50.9)	—	0.94 (23.8)	M18 x 1
	Unshielded	2.72 (69.06)	1.75 (44.4)	0.28 (7)	0.94 (23.8)	M18 x 1
30 mm	Shielded	2.91 (73.8)	1.98 (50.3)	—	1.41 (35.9)	M30 x 1.5
	Unshielded	2.91 (73.8)	1.49 (37.8)	0.52 (13.26)	1.41 (35.9)	M30 x 1.5
Two-Wire AC Sensors—Mini-Connector Models						
18 mm	Shielded	3.39 (86.1)	2.00 (50.8)	0.02 (0.5)	0.94 (23.8)	M18 x 1
	Semi-shielded	3.39 (86.0)	1.90 (48.2)	0.10 (2.54)	0.94 (23.8)	M18 x 1
	Unshielded	3.39 (86.1)	1.46 (37.0)	0.57 (14.5)	0.94 (23.8)	M18 x 1
30 mm	Shielded	3.39 (86.1)	2.1 (53.3)	0.03 (0.8)	1.41 (35.9)	M30 x 1.5
	Semi-shielded	3.44 (87.4)	1.90 (48.2)	0.13 (3.30)	1.41 (35.9)	M30 x 1.5
	Unshielded	3.39 (86.1)	1.55 (39.4)	0.55 (14.0)	1.41 (35.9)	M30 x 1.5

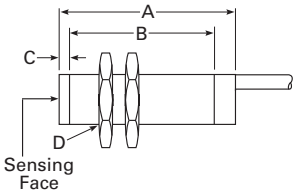
Approximate Dimensions in Inches (mm)

Stainless Steel Short Body (Cable Connector Models)

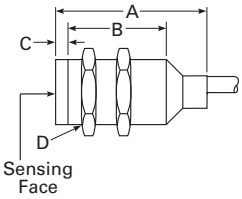
12 mm



18 mm



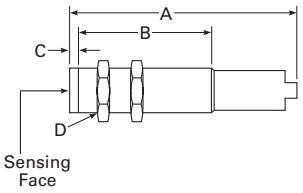
30 mm



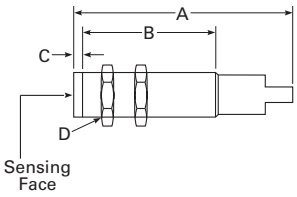
Size	Shielding	Overall Length A	Threaded Length B	Cap Height C	Thread Size D
Two-Wire AC Sensors					
12 mm	Shielded	2.04 (51.7)	1.56 (39.6)	0.02 (0.5)	M12 x 1
	Unshielded	2.04 (51.7)	1.38 (35.1)	0.20 (5)	M12 x 1
18 mm	Shielded	1.39 (35.3)	0.86 (21.82)	0.02 (0.5)	M18 x 1
	Unshielded	1.39 (35.3)	0.60 (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
Two-Wire AC/DC Sensors					
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

Stainless Steel Short Body (Micro-Connector Models)

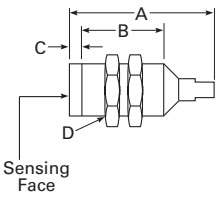
12 mm



18 mm



30 mm



Size	Shielding	Overall Length A	Threaded Length B	Cap Height C	Thread Size D
Two-Wire AC Sensors					
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
Two-Wire AC/DC Sensors					
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

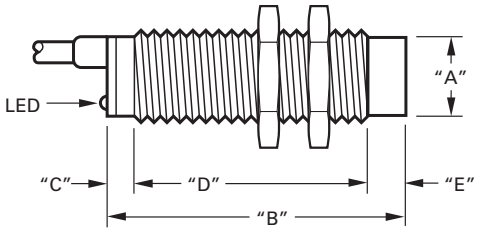
Approximate Dimensions in mm

Nickel-Brass Body

Cable Models

3

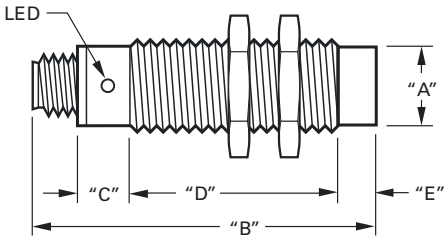
Two-Wire Sensors



Catalog Number	Operating Voltage	A	B	C	D	E
E57-12GS02-A	20–250 Vac	M12x1	65	15	50	—
E57-12GU04-A		M12x1	60	15	42	8
E57-18GS05-A		M18x1	80	20	60	—
E57-18GU08-A		M18x1	80	20	48	12
E57-30GS10-A		M30x1.5	80	20	60	—
E57-30GU15-A		M30x1.5	80	20	45	15
E57-12GS02-D	10–30 Vdc	M12x1	50	—	50	—
E57-12GU04-D		M12x1	50	—	42	8
E57-12GE08-D		M12x1	50	—	42	8
E57-12GE08-D1		M12x1	50	—	42	8
E57-18GS05-D		M18x1	55	5	50	—
E57-18GU08-D		M18x1	55	5	38	12
E57-18GE16-D		M18x1	55	5	38	12
E57-18GE16-D1		M18x1	55	5	38	12
E57-30GS10-D		M30x1.5	55	5	50	—
E57-30GU15-D		M30x1.5	55	5	35	15
E57-30GE25-D		M30x1.5	55	5	35	15
E57-30GE25-D1		M30x1.5	55	5	35	15

Connector Models

Two-Wire Sensors



Catalog Number ①	Operating Voltage	A	B	C	D	E
E57-12GS02-AAB	20–250 Vac	M12x1	68	16	42	—
E57-12GU04-AAB		M12x1	68	16	34	8
E57-18GS05-AAB		M18x1	91	20	60	—
E57-18GU08-AAB		M18x1	91	20	48	12
E57-18GE16-AAB		M18x1	79.2	15	37	11.5
E57-30GS10-AAB		M30x1.5	80	20	60	—
E57-30GU15-AAB		M30x1.5	91	20	45	15
E57-12GS02-DDB	10–30 Vdc	M12x1	69	16	42	—
E57-12GU04-DDB		M12x1	68	16	34	8
E57-12GE08-DDB		M12x1	68	10	50	8
E57-12GE08-D1DB		M12x1	68	10	50	8
E57-18GS05-DDB		M18x1	76	15	61	—
E57-18GU08-DDB		M18x1	80	15	49	12
E57-18GE16-DDB		M18x1	79	15	52	12
E57-30GS10-DDB		M30x1.5	75	15	60	—
E57-30GU15-DDB		M30x1.5	79	15	45	15
E57-30GE25-DDB		M30x1.5	78	15	48	15

Note

① Normally closed models are dimensionally indicated to equivalent normally open models.

AccuProx Analog Sensors

Contents

AccuProx Analog Sensors

Product Description

The AccuProx from Eaton's Electrical Sector is a high performance analog inductive proximity sensor. The AccuProx family of analog sensors provide unmatched sensing range, linearity and resolution in an affordable and compact tubular package.

Unlike standard inductive sensors, which send an open or close signal upon target presence or absence, AccuProx analog sensors provide an electrical signal that varies in proportion to the position of the metal target within its sensing range. This makes AccuProx ideal for applications requiring precise position sensing and measurement.

The sensing performance of AccuProx sets it apart from traditional analog inductive designs. Utilizing components from the cutting-edge iProx family, AccuProx provides sensing ranges of three to four times that of typical tubular analog inductive sensors—all without compromising accuracy.

Unlike many competitive products, which are often hampered by an "S-shaped" output curve, AccuProx outputs are linear.

AccuProx has the range and precision to solve your most difficult measurement applications.

Application Description

Typical Applications

- Part positioning
- Distance, size and thickness measurement
- General inspection and error proofing, such as material imperfection or blemish detection
- Eccentricity or absolute angle detection
- Identification of different metals

See the Application Guide on **Page V8-T3-50** for more detail.

Features

- Extended linear sensing range of up to 25 millimeters—three times longer than standard tubular analog inductive sensors
- Outputs available in current (4–20 or 0–20 mA) and voltage (0–10 V)
- High output resolution and repeatability for applications requiring precision sensing performance
- Robust stainless steel barrel, shock-resistant front cap, polycarbonate end bell and impact-absorbing potting compound
- Ideal for extreme temperature or high pressure washdown environments
- High noise immunity of 20 V/m prevents many problems associated with electrical noise

Standards and Certifications

- UL Listed, E166051
- UL Tested to Canadian safety standards
- CE
- RoHS Compliant

c UL us LISTED CE RoHS COMPLIANT

⚠ 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

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.

Application Guide

Presenting AccuProx—Unmatched Analog Range in a Proven Package

Historically, analog sensors have been limited by very short sensing ranges—as little as one or two millimeters. By utilizing technology first perfected in the iProx family of digital inductive sensors, AccuProx can sense objects as far as 25 millimeters. This extended range can be achieved without making compromises often found in competitive products, such as reduced output accuracy.

AccuProx utilizes many of the proven materials found in other tubular sensor families. The threaded barrel and included mounting nuts are made of stainless steel, which exhibits superior corrosion and abrasion resistance versus nickel-plated brass. AccuProx also features a proprietary internal potting compound that absorbs impacts and vibration while sealing out moisture. The materials used in the construction of AccuProx are time-tested and proven to work.

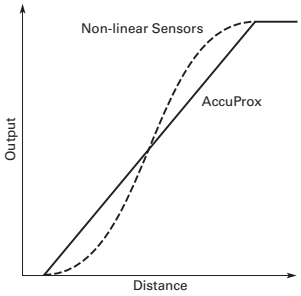
High Output Accuracy

Analog inductive sensors are often used in applications that require a higher level of precision than a standard digital sensor. For example, applications such as part inspection require a sensor that can detect very small variances. AccuProx has been designed with these applications in mind.

Output accuracy is determined by the repeat accuracy, linearity, resolution and response time of the sensor.

Repeat accuracy refers to the variations in sensing distance between successive sensor operations due to component tolerances, where all operating conditions are kept the same. The repeat accuracy of an 18 millimeter, unshielded AccuProx sensor is less than 20 micrometers.

Linearity refers to the shape of the output curve. Many competitive analog sensors exhibit a wavy or "S-shaped" output curve. This means that a change in target distance may not always translate into an equivalent change in output, particularly at the innermost and outermost ranges of a non-linear analog sensor. AccuProx features a linear output. See the diagram below for an example of AccuProx versus a non-linear competitive offering.

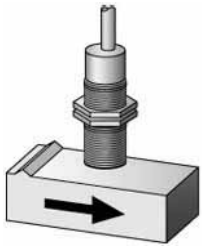


Resolution refers to the number of "steps" in the sensor output. A higher resolution is ideal because it will allow the sensor to detect smaller changes in target position.

An 18 millimeter, unshielded AccuProx features more than 350 output steps, ensuring consistent performance.

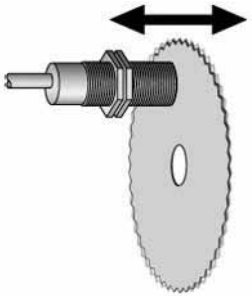
Typical Analog Applications

Material Imperfection or Blemish Detection



Eccentricity or Absolute Angle Detection

Saw Blade Deflection



Product Selection

AccuProx Analog Sensors

Three-/Four-Wire Sensors

	Operating Voltage	Sensing Range ①	Shielding	Connection Type	Current (0–20 mA) and Voltage (0–10 V) Output ② Catalog Number	Current (4– 20 mA) Output Only ② Catalog Number
12 mm 	**12 mm Diameter**					
	15–30 Vdc	0.5–4 mm	Shielded	4-pin micro DC connector	**E59-A12A104D01-CV** ⠿	**E59-A12A104D01-C1** ⠿
				4-pin micro DC pigtail	**E59-A12A104D01P-CV** ⠿	**E59-A12A104D01P-C1** ⠿
				2-meter cable	**E59-A12A104C02-CV**	**E59-A12A104C02-C1**
		1–8 mm	Unshielded	4-pin micro DC connector	**E59-A12C108D01-CV** ⠿	**E59-A12C108D01-C1** ⠿
				4-pin micro DC pigtail	**E59-A12C108D01P-CV** ⠿	**E59-A12C108D01P-C1** ⠿
				2-meter cable	**E59-A12C108C02-CV**	**E59-A12C108C02-C1**
18 mm 	**18 mm Diameter**					
	15–30 Vdc	1–7 mm	Shielded	4-pin micro DC connector	**E59-A18A107D01-CV** ⠿	**E59-A18A107D01-C1** ⠿
				4-pin micro DC pigtail	**E59-A18A107D01P-CV** ⠿	**E59-A18A107D01P-C1** ⠿
				2-meter cable	**E59-A18A107C02-CV**	**E59-A18A107C02-C1**
		1–15 mm	Unshielded	4-pin micro DC connector	**E59-A18C115D01-CV** ⠿	**E59-A18C115D01-C1** ⠿
				4-pin micro DC pigtail	**E59-A18C115D01P-CV** ⠿	**E59-A18C115D01P-C1** ⠿
				2-meter cable	**E59-A18C115C02-CV**	**E59-A18C115C02-C1**
30 mm 	**30 mm Diameter**					
	15–30 Vdc	1–12 mm	Shielded	4-pin micro DC connector	**E59-A30A112D01-CV** ⠿	**E59-A30A112D01-C1** ⠿
				4-pin micro DC pigtail	**E59-A30A112D01P-CV** ⠿	**E59-A30A112D01P-C1** ⠿
				2-meter cable	**E59-A30A112C02-CV**	**E59-A30A112C02-C1**
		1–25 mm	Unshielded	4-pin micro DC connector	**E59-A30C125D01-CV** ⠿	**E59-A30C125D01-C1** ⠿
				4-pin micro DC pigtail	**E59-A30C125D01P-CV** ⠿	**E59-A30C125D01P-C1** ⠿
				2-meter cable	**E59-A30C125C02-CV**	**E59-A30C125C02-C1**

Compatible Connector Cables

Standard Cables ③

	Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number
Micro-Style Straight Female 	**Micro-Style, Straight Female**						
	DC	4-pin, 3-wire	22 AWG	6.0 ft (2m)	 1-Brown 2-No Wire 3-Blue 4-Black	**CSDS4A3CY2202**	**CSDS4A3RY2202**
	DC	4-pin, 4-wire	22 AWG	6.0 ft (2m)	 1-Brown 2-White 3-Blue 4-Black	**CSDS4A4CY2202**	**CSDS4A4RY2202**

Notes

⠿ See listing of compatible connector cables above.

① Published range data is based on a 1 mm thick square target made of Type FE 360 steel per ISO Standard 630.

② Models available in custom output configurations (for example, 1–5 V, 0–5 V). Contact factory for details.

③ For a full selection of connector cables, see **Tab 10**, **section 10.1**.

Technical Data and Specifications

AccuProx Analog Sensors

Description	12 mm Models Shielded	12 mm Models Unshielded	18 mm Models Shielded	18 mm Models Unshielded	30 mm Models Shielded	30 mm Models Unshielded
Performance						
Analog operating range ①	0.5–4 mm	1–8 mm	1–7 mm	1–15 mm	1–12 mm	1–25 mm
Temperature range	–40 to 158 °F (–40 to 70 °C)	–40 to 158 °F (–40 to 70 °C)	–40 to 158 °F (–40 to 70 °C)	–40 to 158 °F (–40 to 70 °C)	–40 to 158 °F (–40 to 70 °C)	–40 to 158 °F (–40 to 70 °C)
Temperature drift	<± 10%	<± 10%	<± 10%	<± 10%	<± 10%	<± 10%
Conformity	<± 10%	<± 10%	<± 10%	<± 10%	<± 10%	<± 10%
Repeat accuracy	<25 µm ②	<20 µm ②	<40 µm ②	<20 µm ②	<50 µm ②	<30 µm ②
Minimum repeat accuracy	<3.0% at max. range	<1.1% at max. range	<2.2% at max. range	<1.2% at max. range	<1.2% at max. range	<0.8% at max. range
Recovery time	<1.0 ms	<1.1 ms	<1.5 ms	<2.0 ms	<2.0 ms	<3.0 ms
Response time	200 Hz	100 Hz	200 Hz	100 Hz	140 Hz	100 Hz
Linearity tolerance	<± 1.0% of full scale	<± 1.0% of full scale	<± 1.0% of full scale	<± 1.0% of full scale	<± 1.0% of full scale	<± 1.0% of full scale
Resolution	23 µm max.	16 µm max.	40 µm max.	21 µm max.	50 µm max.	30 µm max.
Electrical						
Style	AccuProx Analog, three-/four-wire DC	AccuProx Analog, three-/four-wire DC	AccuProx Analog, three-/four-wire DC	AccuProx Analog, three-/four-wire DC	AccuProx Analog, three-/four-wire DC	AccuProx Analog, three-/four-wire DC
Operating voltage	15–30 Vdc	15–30 Vdc	15–30 Vdc	15–30 Vdc	15–30 Vdc	15–30 Vdc
Current output signal	0–20 mA or 4–20 mA by model	0–20 mA or 4–20 mA by model	0–20 mA or 4–20 mA by model	0–20 mA or 4–20 mA by model	0–20 mA or 4–20 mA by model	0–20 mA or 4–20 mA by model
Current output load resistance	400–500 ohms	400–500 ohms	400–500 ohms	400–500 ohms	400–500 ohms	400–500 ohms
Current output ripple content	± 40 µA max.	± 40 µA max.	± 40 µA max.	± 40 µA max.	± 40 µA max.	± 40 µA max.
Current output minimum change	30 µA	20 µA	50 µA	28 µA	66 µA	40 µA
Voltage output signal ③	0–10 V	0–10 V	0–10 V	0–10 V	0–10 V	0–10 V
Voltage output load resistance	4.7–5.0 kohm (2.5 mA max.)	4.7–5.0 kohm (2.5 mA max.)	4.7–5.0 kohm (2.5 mA max.)	4.7–5.0 kohm (2.5 mA max.)	4.7–5.0 kohm (2.5 mA max.)	4.7–5.0 kohm (2.5 mA max.)
Voltage output ripple content	± 10 mV max.	± 10 mV max.	± 10 mV max.	± 10 mV max.	± 10 mV max.	± 10 mV max.
Voltage output minimum change	15 mV	10 mV	25 mV	14 mV	33 mV	20 mV
Burden current	<20 mA	<20 mA	<20 mA	<20 mA	<20 mA	<20 mA
Output LED	Dual-color, 360° viewable	Dual-color, 360° viewable	Dual-color, 360° viewable	Dual-color, 360° viewable	Dual-color, 360° viewable	Dual-color, 360° viewable
Short-circuit protection	Incorporated ④	Incorporated ④	Incorporated ④	Incorporated ④	Incorporated ④	Incorporated ④
Wire breakage protection	Incorporated	Incorporated	Incorporated	Incorporated	Incorporated	Incorporated
Reverse polarity protection	Incorporated	Incorporated	Incorporated	Incorporated	Incorporated	Incorporated
Physical						
Size	See Dimensions on **Page V8-T3-54**.					
Enclosure protection	NEMA 4, 4X, 6, 6P, 13	NEMA 4, 4X, 6, 6P, 13	NEMA 4, 4X, 6, 6P, 13	NEMA 4, 4X, 6, 6P, 13	NEMA 4, 4X, 6, 6P, 13	NEMA 4, 4X, 6, 6P, 13
Shock	30 g half-sine at 11 ms	30 g half-sine at 11 ms	30 g half-sine at 11 ms	30 g half-sine at 11 ms	30 g half-sine at 11 ms	30 g half-sine at 11 ms
Vibration	10–55 Hz, 1 mm amplitude	10–55 Hz, 1 mm amplitude	10–55 Hz, 1 mm amplitude	10–55 Hz, 1 mm amplitude	10–55 Hz, 1 mm amplitude	10–55 Hz, 1 mm amplitude
Housing material	Stainless steel, polycarbonate end bell, polyphenylene sulfide front cap	Stainless steel, polycarbonate end bell, polyphenylene sulfide front cap	Stainless steel, polycarbonate end bell, polyphenylene sulfide front cap	Stainless steel, polycarbonate end bell, polyphenylene sulfide front cap	Stainless steel, polycarbonate end bell, polyphenylene sulfide front cap	Stainless steel, polycarbonate end bell, polyphenylene sulfide front cap
Termination	Micro-connector, potted cable, 2m; Pigtail, micro-connector, 2m	Micro-connector, potted cable, 2m; Pigtail, micro-connector, 2m	Micro-connector, potted cable, 2m; Pigtail, micro-connector, 2m	Micro-connector, potted cable, 2m; Pigtail, micro-connector, 2m	Micro-connector, potted cable, 2m; Pigtail, micro-connector, 2m	Micro-connector, potted cable, 2m; Pigtail, micro-connector, 2m

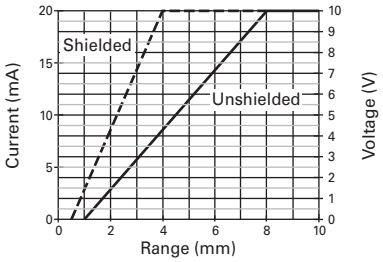
Notes

① Published range data is based on a 1 mm thick square target made of Type FE 360 steel per ISO Standard 630.
② The sensor achieves its maximum repeat accuracy after warming up for a period of at least one hour.
③ Voltage outputs available on models ending in **-CV**.
④ Continuous short-circuits can exceed power dissipation ratings and cause eventual destruction.

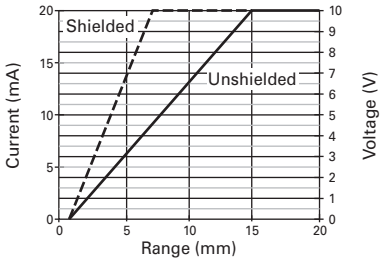
AccuProx Analog Performance Graphs

Linear Output

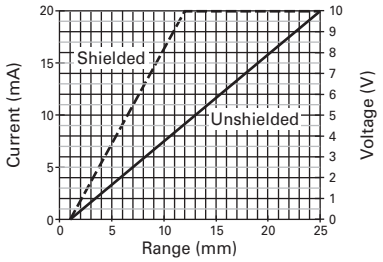
12 mm



18 mm

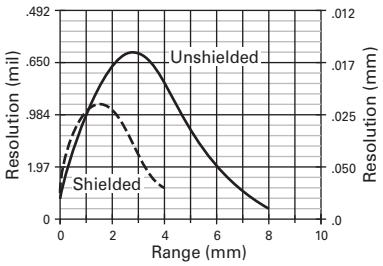


30 mm

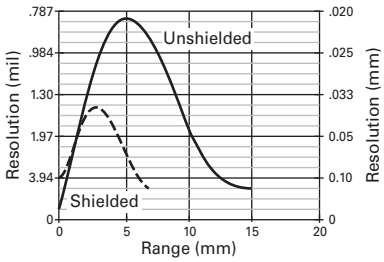


Measurement Resolution ①

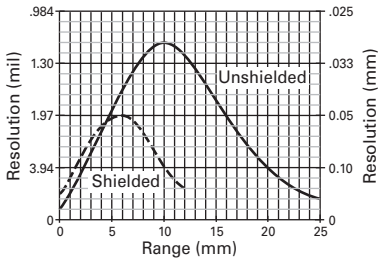
12 mm



18 mm

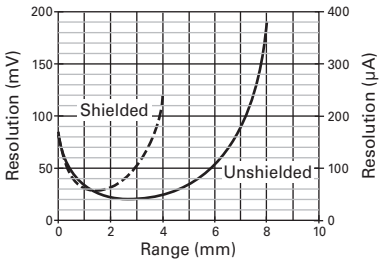


30 mm

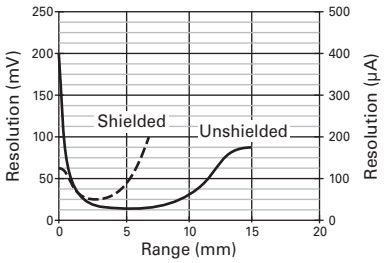


Output Resolution ②

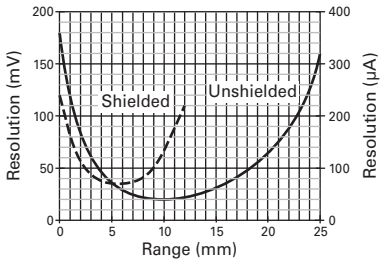
12 mm



18 mm



30 mm



Notes

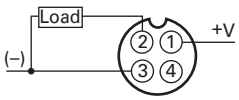
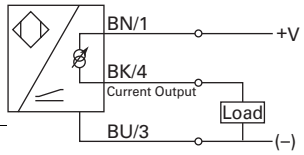
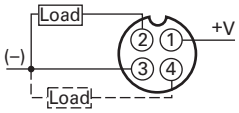
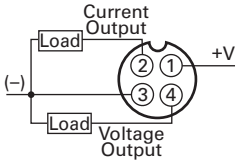
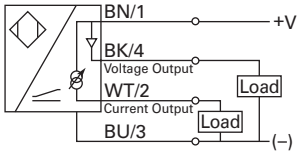
① Measurement resolution is the sensor's ability to detect a change in target position. The measurement resolution is the finest at the highest point in the curve.

② Output resolution is the change in output signal relative to target position. The minimum change in output resolution is defined by the lowest point in the curve.

Wiring Diagrams

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

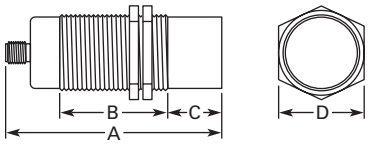
AccuProx Analog Sensors

Style	Output(s)	Micro-Connector Models	Cable and Pigtail Models
12 mm diameter models ending in **-C1** ①	Current: 4–20 mA		
18 and 30 mm diameter models ending in **-C1** ①			
Models ending in **-CV**	Current: 0–20 mA Voltage: 0–10 V		

Dimensions

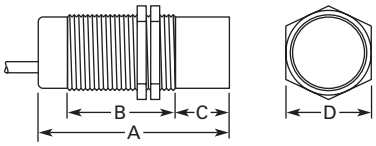
Approximate Dimensions in Inches (mm)

Micro-Connector Models



Size	Shielding	A	B	C	D
12 mm	Shielded	3.05 (77.5)	1.98 (50.3)	0.02 (0.50)	0.67 (17)
	Unshielded	3.05 (77.5)	1.64 (41.6)	0.36 (9)	0.67 (17)
18 mm	Shielded	2.73 (69.3)	2.00 (50.9)	0.02 (0.50)	0.94 (24)
	Unshielded	2.73 (69.3)	1.47 (37.4)	0.55 (14)	0.94 (24)
30 mm	Shielded	2.92 (74.1)	2.13 (54.1)	0.03 (0.75)	1.41 (36)
	Unshielded	2.92 (74.1)	1.41 (35.8)	0.75 (19)	1.41 (36)

Cable and Pigtail Models



Size	Shielding	A	B	C	D
12 mm	Shielded	2.46 (62.4)	1.98 (50.3)	0.02 (0.5)	0.67 (17)
	Unshielded	2.46 (62.4)	1.64 (41.6)	0.36 (9)	0.67 (17)
18 mm	Shielded	2.54 (64.5)	2.00 (50.9)	0.02 (0.5)	0.94 (24)
	Unshielded	2.54 (64.5)	1.47 (37.4)	0.55 (14)	0.94 (24)
30 mm	Shielded	2.74 (69.6)	2.13 (54.1)	0.03 (0.75)	1.41 (36)
	Unshielded	2.74 (69.6)	1.41 (35.8)	0.75 (19)	1.41 (36)

Note

① For models ending in **-C1** (current output only models), pins 2 and 4 are intentionally connected.
Do not connect outputs of **-C1** models to separate loads—this sensor should only be connected to a single-output load.

Ferrous Only Tubular Sensors

Contents

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)

Standards and Certifications

- CSA Certified
- Products certified by CSA for US
- CE
- RoHS Compliant

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

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

Ferrous Only Tubular Sensors

3

Two-Wire Sensors

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

Three-Wire Sensors

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

Compatible Connector Cables

Standard Cables ①

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

Accessories

Ferrous Only Tubular Sensors

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

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

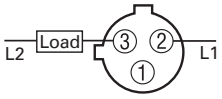
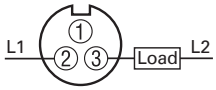
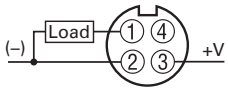
Ferrous Only Tubular Sensors

Description	Two-Wire AC/DC Sensors	Three-Wire DC Sensors
Operating voltage	20–250 Vac/dc	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	10 V maximum	1.5 V 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	30 g sine wave, 11 ms per IEC68-2-76	30 g 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.

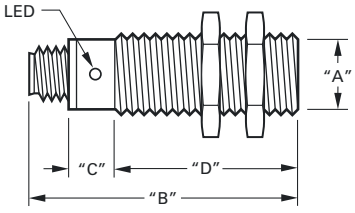
Ferrous Only Tubular Sensors

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

Dimensions

Approximate Dimensions in Inches (mm)

Ferrous Only Tubular Sensors



Connector Models

Catalog Number	A	B	C	D
Two-Wire Models				
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)
Three-Wire Models				
E57FAL18T111SD	M18 x 1	3.11 (79)	1.14 (29)	1.97 (50)

3

Metal Face Sensors

Contents

Metal Face Sensors

Product Description

Metal Face Inductive Proximity Sensors by Eaton's Electrical Sector incorporate tough stainless steel sensing faces in place of the plastic faces found in standard sensors. This provides a higher level of protection for more reliable operation and longer life in harsh environments.

The sensors stand up to abrasion and impact caused by flying metal chips, grit, and misaligned or vibrating targets. In addition, the stainless steel body resists corrosion and chemical attack.

Common sensor diameters, voltage styles and wiring connections make it easy to retrofit your existing, damaged sensors. Solve the problem of damaged sensors permanently with Eaton's Metal Face Sensors.

Features

- Two-wire AC/DC models and three-wire DC models are compatible with your existing wiring
- Common 12 mm, 18 mm and 30 mm housing diameters allow easy changeout of existing damaged sensors
- The 20 mil stainless steel sensing face is thicker than competing units for a higher level of protection
- The stainless steel body is damage and corrosion resistant
- Wide operating temperature range: –13 to 158 °F (–25 to 70 °C)

Standards and Certifications

- CSA Certified
- Products certified by CSA for US
- CE
- RoHS Compliant

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

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

Metal Face Sensors

Two-Wire Sensors

	Operating Voltage	Sensing Range (Sn)	Shielding	Connection Type	NO Output Catalog Number
12 mm 	**12 mm Diameter**				
	20–250 Vac/dc 50/60 Hz	2 mm	Shielded	3-pin micro AC connector	**E57FAL12A2SA-M**
30 mm 	**30 mm Diameter**				
	20–250 Vac/dc 50/60 Hz	10 mm	Shielded	3-pin micro AC connector	**E57FAL30A2SA-M**

Three-Wire Sensors

	Operating Voltage	Sensing Range (Sn)	Shielding	Connection Type	NO Output Catalog Number
12 mm 	**12 mm Diameter**				
	10–30 Vdc	2 mm	Shielded (PNP)	4-pin micro DC connector	**E57FAL12T111SD-M**
18 mm 	**18 mm Diameter**				
	10–30 Vdc	5 mm	Shielded (PNP)	4-pin micro DC connector	**E57FAL18T111SD-M**

Compatible Connector Cables

Standard Cables ①

	Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number
Micro-Style Straight Female 	**Micro-Style, Straight Female**						
	AC	3-pin, 3-wire	22 AWG	6.0 ft (2m)	 1-Green 2-Red/Black 3-Red/White	**CSAS3F3CY2202**	**CSAS3F3RY2202**
	DC	4-pin, 4-wire	22 AWG	6.0 ft (2m)	 1-Brown 2-White 3-Blue 4-Black	**CSDS4A4CY2202**	**CSDS4A4RY2202**

Notes

See listing of compatible connector cables above.

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

Accessories

Metal Face Sensors

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

Technical Data and Specifications

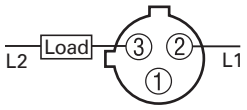
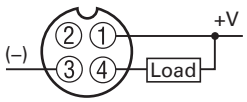
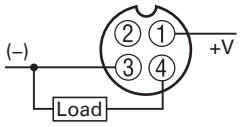
Metal Face Sensors

Description	Two-Wire AC/DC Sensors	Three-Wire DC Only Sensors
Operating voltage	20–250 Vac/dc	10–30 Vdc
Maximum load current	100 mA	100 mA
Switching frequency		
12 mm	15 Hz	2000 Hz
18 mm	—	1000 Hz
30 mm	—	300 Hz
Leakage current	2.5 mA maximum	600 µA maximum
Voltage drop	10 V maximum	1.5 V 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	<200 ms	<200 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	30 g sine wave, 11 ms per IEC68-2-76	30 g 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	303 stainless steel	303 stainless steel
Face thickness	20 mils	20 mils

Wiring Diagrams

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

Metal Face Sensors

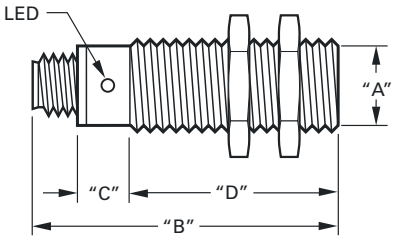
Operating Voltage	Output	Micro-Connector Models (Face View Male Shown)
Two-Wire Sensors		
20–250 Vac/dc 50/60 Hz	NO	
Three-Wire Sensors		
10–30 Vdc	NO (NPN)	
	NO (PNP)	

Dimensions

Approximate Dimensions in Inches (mm)

Metal Face Sensors

Connector Models



Catalog Number	A	B	C	D
Two-Wire Models				
E57FAL12A2SA-M	M x 12	2.67 (68)	1.10 (28)	1.58 (40)
E57FAL30A2SA-M	M x 30	3.70 (94)	1.34 (34)	2.36 (60)
Three-Wire Models				
E57FAL12T111SD-M	M x 12	2.67 (68)	1.02 (26)	1.65 (42)
E57FAL18T110SD-M	M x 18	3.11 (79)	1.14 (29)	1.97 (50)
E57FAL18T111SD-M	M x 18	3.11 (79)	1.14 (29)	1.97 (50)

3

High Current Output Sensors

Contents

High Current Output Sensors

Product Description

Now there is an alternative to limit switches for position sensing on industrial vehicles. High Current Output Sensors feature a continuous output current rating from 2 to 8 A. These sensors from Eaton's Electrical Sector are ideally suited to handle high current loads found on such industrial vehicles as aerial lift trucks, fork lifts, refuse trucks, cement mixers, dump trucks, hook and ladder trucks, front end loaders, farm equipment and hundreds of other vehicles that are constantly subjected to mechanical (shock, vibration, collisions) and environmental (dirt, grease, ice, rain) abuse that create havoc with mechanical devices.

Features

- Solid-state output can handle up to 8 A continuous
- Ideal for vehicle use to replace mechanical limit switches, typically required to handle high currents
- Wide voltage and temperature range covers most vehicle power supplies and operating environments
- Normally Open and Normally Closed isolated outputs
- SJO cable is available in custom lengths
- Dual colored 360° LED indicating light, green as power ON and red as output

Standards and Certifications

- RoHS Compliant

RoHS COMPLIANT

⚠ 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

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

High Current Output Sensors

30 mm

Four-Wire Sensors

Operating Voltage	Sensing Range	Shielding	Output Type	Output Rating Continuous	Output Rating <100 ms Pulse	Connection Type ①	Catalog Number
30 mm Diameter							
10–55 Vdc	10 mm	Shielded	NO and NC (PNP)	3.5 A	20 A	2-meter cable	**E57-30JS10-H**

30 mm

Six-Wire Sensors ②

Operating Voltage	Sensing Range	Shielding	Output Type	Output Rating Continuous	Output Rating <100 ms Pulse	Connection Type ①	Catalog Number
30 mm Diameter							
10–30 Vdc	10 mm	Shielded	NO and NO, or NC and NC (NPN or PNP)	8 A	50 A	2-meter cable	**E57-30HS10-K**

Accessories

High Current Output Sensors

Description	Reference
Mounting brackets	See **Tab 8, section 8.2**
Replacement mounting nuts and other accessories	See **Tab 8, section 8.3**

Notes

① For additional cable length other than 2-meter, add desired length in meters to listed catalog number. Example: For an E57-30JS10-H with a 5-meter cable, order E57-30JS10-H**5**.

② 50 Amp surge, 12 Amp at 50% duty cycle and 8 Amp continuous.

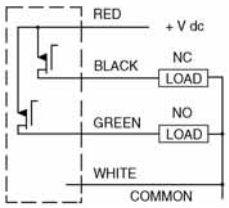
Technical Data and Specifications

High Current Output Sensors

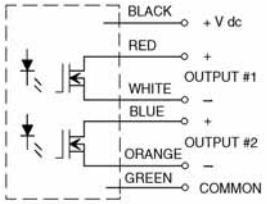
Description	Four-Wire Sensors	Six-Wire Sensors
Operating voltage	10 to 55 Vdc	10 to 30 Vdc
Switching rate	250 Hz	100 Hz
Off-state current	100 Aμ maximum	100 Aμ maximum
Voltage drop	1.2 V	2.0 V
Burden current	10 mA at 55 volts	30 mA at 30 volts
Time delay before availability	<100 ms	<100 ms
Output indicator LED	360° visibility	360° visibility
Output type	Solid-state	Solid-state, isolated
Protection	Transient and power on false pulse	Transient and power on false pulse
Enclosure ratings	NEMA 4, 4X, 6, 6P, 12 and 13 (IEC IP67)	NEMA 4, 4X, 6, 6P, 12 and 13 (IEC IP67)
Ambient temperature range	–40 to 158 °F (–40 to 70 °C)	–40 to 158 °F (–40 to 70 °C)
Barrel material	303 stainless steel	303 stainless steel
Cable	2m standard SJO water resistive (18 AWG)	2m standard SJO water resistive (18 AWG)
Shock	30 g sine wave, 11 ms	30 g sine wave, 11 ms
Vibration	10 to 55 Hz, 2 mm amplitude in all 3 planes	10 to 55 Hz, 2 mm amplitude in all 3 planes

Wiring Diagrams

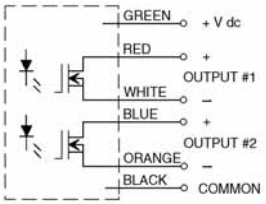
Four-Wire—PNP



Six-Wire—NO/NO Output Configuration



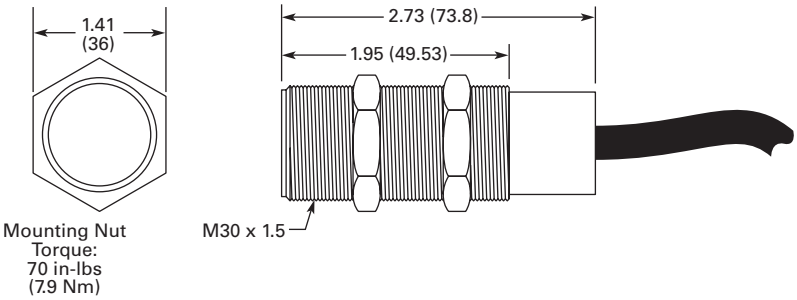
Six-Wire—NC/NC Output Configuration



Dimensions

Approximate Dimensions in Inches (mm)

High Current Output Sensors



Small Diameter (4, 5, 6.5, 8 mm) Sensors

Contents

3

Small Diameter (4, 5, 6.5, 8 mm) Sensors

Product Description

These unique Inductive Proximity Sensors by Eaton's Electrical Sector are designed to be used in extremely small spaces. A wide variety of models are available with housing diameters from 8 mm all the way down to 4 mm, allowing you to choose the one that best fits your application. The sensors are three-wire devices that operate from 10 to 30 Vdc. Both shielded and unshielded versions are available.

Application Description

Typical Applications

- Automation equipment
- Robotics
- Machine tool
- Counting
- Sorting

Features

- Small 4, 5, 6.5 and 8 mm diameters for use in applications with limited space for mounting sensors
- Stainless steel housings
- All models include an LED indicator to show output status
- Short circuit and reverse polarity protection
- Rated NEMA 4, 4X, 6, 6P, 12 and 13 (IP67) for high resistance to environmental factors

Standards and Certifications

- CE
- RoHS Compliant
- 8 mm standard models only:
  - CSA Certified, 224447
  - Products certified by CSA for US

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

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

Small Diameter (4, 5, 6.5, 8 mm) Sensors

3

Three-Wire Sensors

	Operating Voltage	Sensing Range (Sn)	Shielding	Connection Type	NO Output Catalog Number	NC Output Catalog Number
4 mm 	**4 mm Diameter (Unthreaded)**					
	10–30 Vdc	0.8 mm	Shielded (NPN)	2-meter cable	**E57EAL4T110SP**	—
				3-pin nano-connector	**E57EAL4T110SN**	—
			Shielded (PNP)	2-meter cable	**E57EAL4T111SP**	—
				3-pin nano-connector	**E57EAL4T111SN**	—
	5 mm Diameter					
5 mm 	10–30 Vdc	0.8 mm	Shielded (NPN)	2-meter cable	**E57EAL5T110SP**	—
				3-pin nano-connector	**E57EAL5T110SN**	—
			Shielded (PNP)	2-meter cable	**E57EAL5T111SP**	—
				3-pin nano-connector	**E57EAL5T111SN**	—
	6.5 mm Diameter (Unthreaded)					
6.5 mm 	10–30 Vdc	1 mm	Shielded (NPN)	2-meter cable	**E57EAL6T110SP**	—
				3-pin nano-connector	**E57EAL6T110SN**	—
				4-pin micro DC connector	**E57EAL6T110SD**	—
			Shielded (PNP)	2-meter cable	**E57EAL6T111SP**	—
				3-pin nano-connector	**E57EAL6T111SN**	—
				4-pin micro DC connector	**E57EAL6T111SD**	—
		2 mm	Unshielded (NPN)	2-meter cable	**E57EAL6T110EP**	—
				3-pin nano-connector	**E57EAL6T110EN**	—
			Unshielded (PNP)	2-meter cable	**E57EAL6T111EP**	—
				3-pin nano-connector	**E57EAL6T111EN**	—
	8 mm Diameter Short Body					
8 mm Short Body 	10–30 Vdc	1 mm	Shielded (NPN)	2-meter cable	**E57EAL8T110SP**	**E57EBL8T110SP**
				3-pin nano-connector	**E57EAL8T110SN**	**E57EBL8T110SN**
				4-pin micro DC connector	**E57EAL8T110SD**	**E57EBL8T110SD**
			Shielded (PNP)	2-meter cable	**E57EAL8T111SP**	**E57EBL8T111SP**
				3-pin nano-connector	**E57EAL8T111SN**	**E57EBL8T111SN**
				4-pin micro DC connector	**E57EAL8T111SD**	**E57EBL8T111SD**
		2 mm	Unshielded (NPN)	2-meter cable	**E57EAL8T110EP**	**E57EBL8T110EP**
				3-pin nano-connector	**E57EAL8T110EN**	**E57EBL8T110EN**
				4-pin micro DC connector	**E57EAL8T110ED**	**E57EBL8T110ED**
			Unshielded (PNP)	2-meter cable	**E57EAL8T111EP**	**E57EBL8T111EP**
				3-pin nano-connector	**E57EAL8T111EN**	**E57EBL8T111EN**
				4-pin micro DC connector	**E57EAL8T111ED**	**E57EBL8T111ED**

Note

See listing of compatible connector cables on **Page V8-T3-68**.

Three-Wire Sensors, continued

8 mm Standard Length

Operating Voltage	Sensing Range	Shielding	Output Type	Connection Type	NO Output Catalog Number	NC Output Catalog Number
8 mm Diameter Standard Length						
10–30 Vdc	1 mm	Shielded	NPN	2-meter cable	**E57-08GS01-C**	**E57-08GS01-C1**
				3-pin nano-connector	**E57-08GS01-CNB**	**E57-08GS01-C1NB**
				4-pin micro DC connector	**E57-08GS01-CDB**	**E57-08GS01-C1DB**
			PNP	2-meter cable	**E57-08GS01-G**	**E57-08GS01-G1**
				3-pin nano-connector	**E57-08GS01-GNB**	**E57-08GS01-G1NB**
				4-pin micro DC connector	**E57-08GS01-GDB**	**E57-08GS01-G1DB**
	3 mm (extended range)		NPN	2-meter cable	**E57-08GE03-C**	**E57-08GE03-C1**
				3-pin nano-connector	**E57-08GE03-CNB**	**E57-08GE03-C1NB**
				4-pin micro DC connector	**E57-08GE03-CDB**	**E57-08GE03-C1DB**
			PNP	2-meter cable	**E57-08GE03-G**	**E57-08GE03-G1**
				3-pin nano-connector	**E57-08GE03-GNB**	**E57-08GE03-G1NB**
				4-pin micro DC connector	**E57-08GE03-GDB**	**E57-08GE03-G1DB**
	2 mm	Unshielded	NPN	2-meter cable	**E57-08GU02-C**	**E57-08GU02-C1**
				3-pin nano-connector	**E57-08GU02-CNB**	**E57-08GU02-C1NB**
				4-pin micro DC connector	**E57-08GU02-CDB**	**E57-08GU02-C1DB**
			PNP	2-meter cable	**E57-08GU02-G**	**E57-08GU02-G1**
				3-pin nano-connector	**E57-08GU02-GNB**	**E57-08GU02-G1NB**
				4-pin micro DC connector	**E57-08GU02-GDB**	**E57-08GU02-G1DB**
	6 mm (extended range)		NPN	2-meter cable	**E57-08GE06-C**	**E57-08GE06-C1**
				4-pin micro DC connector	**E57-08GE06-CDB**	**E57-08GE06-C1DB**
			PNP	2-meter cable	**E57-08GE06-G**	**E57-08GE06-G1**
				4-pin micro DC connector	**E57-08GE06-GDB**	**E57-08GE06-G1DB**

Note

See listing of compatible connector cables on **Page V8-T3-68**.

3

Compatible Connector Cables

Standard Cables①

Micro-Style Straight Female

Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number
Micro-Style, Straight Female						
DC	4-pin, 3-wire	22 AWG	6.0 ft (2m)	① ② ④ ③ 1-Brown 2-No Wire 3-Blue 4-Black	**CSDS4A3CY2202**	**CSDS4A3RY2202**
	4-pin, 4-wire	22 AWG	6.0 ft (2m)	① ② ④ ③ 1-Brown 2-White 3-Blue 4-Black	**CSDS4A4CY2202**	**CSDS4A4RY2202**

Nano-Style Straight Female

Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number
Nano-Style, Straight Female						
—	3-pin	24 AWG	6.0 ft (2m)	③ ④ ① 1-Brown 3-Blue 4-Black	**CSNS3A3CY2402**	**CSNS3A3RY2402**

Accessories

Small Diameter Sensors

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

Note

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

Technical Data and Specifications

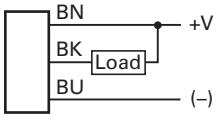
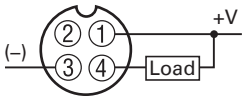
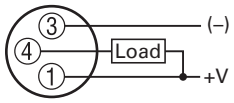
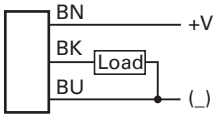
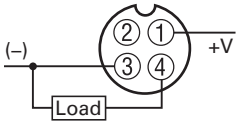
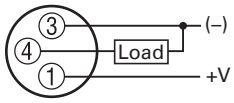
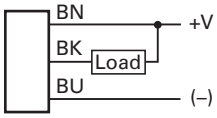
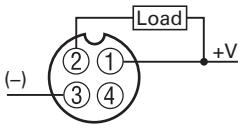
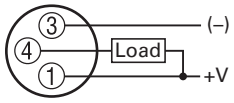
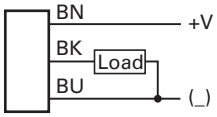
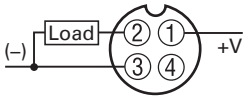
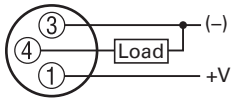
Small Diameter Sensors

Description	Three-Wire DC Only Sensors
Operating voltage	10–30 Vdc
Maximum load current	200 mA
Switching frequency	2 kHz
Leakage current	0.01 mA maximum
Voltage drop	1.5 V maximum
Burden current	10 mA maximum
Protection	Transient, power on false pulse suppression, auto reset short circuit
Switching hysteresis	<15% rated sensing distance
Repeat accuracy	<1% sensing distance
Time delay before availability	<50 ms
Output indicator LED	Lights when output is ON
Operating temperature	–13 to 158 °F (–25 to 70 °C)
Enclosure ratings	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67)
Housing material	Stainless steel
Cable	PVC high flex, oil/water resistant, 22 AWG

Wiring Diagrams

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

Small Diameter Sensors

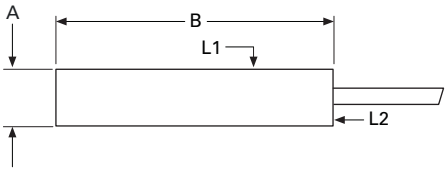
Operating Voltage	Output	Cable Models	Connector Models (Face View Male Shown) Micro	Nano
Three-Wire Sensors				
10–30 Vdc	NO (NPN)			
	NO (PNP)			
	NC (NPN)			
	NC (PNP)			

Dimensions

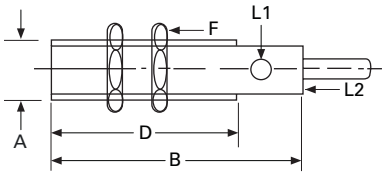
Approximate Dimensions in Inches (mm)

Cable Models

Unthreaded Barrel



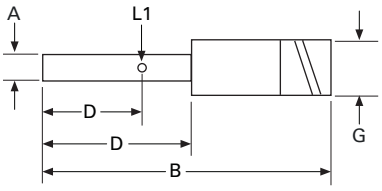
Threaded Barrel



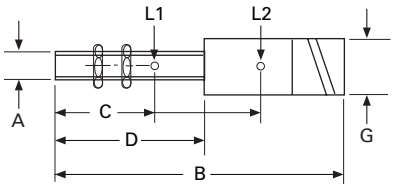
Size A ①	Barrel Type	Length B	D	Thread Size	Nut Width F	Connector Diameter G	LED Location
Cable Models							
4 mm (S, Std)	Unthreaded	1.0 (25)	—	—	—	—	L1
5 mm (S, Std)	Threaded	1.0 (25)	0.8 (21)	M5 x 0.5	SW8	—	L1
6.5 mm (S/U, Std)	Unthreaded	1.8 (45)	—	—	—	—	L2
8 mm Short Body (S/U, Std)	Threaded	1.2 (30)	1.2 (30)	M8 x 1	SW13	—	L2
Standard Length							
8 mm (S, Std)	Threaded	1.77 (45)	1.77 (45)	M8 x 1	SW13	—	L2
8 mm (S, Ext)	Threaded	1.81 (46)	1.57 (40)	M8 x 1	SW13	—	L2
8 mm (U, Std)	Threaded	1.77 (45)	1.61 (41)	M8 x 1	SW13	—	L2
8 mm (U, Ext)	Threaded	1.77 (45)	1.61 (41)	M8 x 1	SW13	—	L2

Connector Models

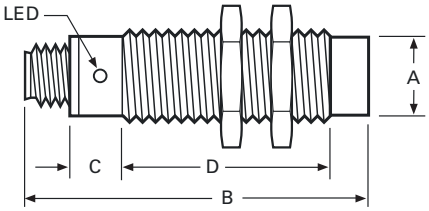
Unthreaded Barrel



Threaded Barrel



Standard Length 8 mm



Size A ①	Barrel Type	Length B	C	D	Thread Size	Nut Width F	Connector Diameter G	LED Location
Nano-Connector Models								
4 mm (S, Std)	Unthreaded	1.6 (40)	0.7 (18)	0.8 (21)	—	—	0.31 (8)	L1
5 mm (S, Std)	Threaded	1.6 (40)	0.7 (18)	0.8 (21)	M5 x 0.5	SW8	0.31 (8)	L1
6.5 mm (S/U, Std)	Unthreaded	2.4 (60)	1.5 (39)	2.0 (50)	—	—	0.31 (8)	L1
8 mm Short Body (S/U, Std)	Threaded	1.8 (45)	1.0 (25)	1.4 (36)	M8 x 1	SW13	0.31 (8)	L1
Standard Length								
8 mm (S, Std)	Threaded	2.36 (60)	0.79 (20)	1.57 (40)	M8 x 1	SW13	0.31 (8)	L2
8 mm (S, Ext)	Threaded	2.40 (61)	0.75 (19)	1.65 (42)	M8 x 1	SW13	0.31 (8)	L2
8 mm (U, Std)	Threaded	2.36 (60)	0.79 (20)	1.42 (36)	M8 x 1	SW13	0.31 (8)	L2
Micro-Connector Models								
6.5 mm (S/U, Std)	Unthreaded	2.9 (70)	1.4 (36)	1.5 (39)	—	—	0.47 (12)	L1
8 mm Short Body (S/U, Std)	Threaded	2.0 (50)	1.6 (40)	1.0 (25)	M8 x 1	SW13	0.47 (12)	L2
Standard Length								
8 mm (S, Std)	Threaded	2.76 (70)	0.83 (21)	1.93 (49)	M8 x 1	SW13	0.47 (12)	L2
8 mm (S, Ext)	Threaded	2.80 (71)	1.02 (26)	1.42 (36)	M8 x 1	SW13	0.47 (12)	L2
8 mm (U, Std)	Threaded	2.76 (70)	0.83 (21)	1.77 (45)	M8 x 1	SW13	0.47 (12)	L2
8 mm (U, Ext)	Threaded	2.76 (70)	1.22 (31)	1.38 (35)	M8 x 1	SW13	0.47 (12)	L2

Note

① U = Unshielded (4 mm cap), S = Shielded; Std = Standard Range, Ext = Extended Range.

E56 Pancake Sensors

Contents

E56 Pancake Sensors

Product Description

The E56 Pancake Sensor from Eaton's Electrical Sector is a high performance inductive proximity sensor. The E56 Pancake provides greater sensing ranges than other inductive sensor package types.

The E56 Pancake family provides convenience and ease of wiring with auto-configurable, complementary outputs. (Auto-configurable outputs automatically detect an NPN or PNP output configuration and switch the sensor accordingly, without user intervention.) Power and output LEDs make trouble-shooting much easier than conventional proximity sensors, which usually only feature output LEDs. These convenience features, combined with the performance of the E56 Pancake, make it an excellent inductive sensing solution for applications requiring an extremely rugged, long-range sensing solution.

Application Description

Typical Applications

- Heavy-duty trucks, cranes and machinery
- Steel mills
- Pipe and rod manufacturing
- Automotive manufacturing
- Amusement parks

Features

- Longest inductive sensing ranges available (up to 100 mm)
- Three sizes to meet your application needs, with maximum ranges of 50, 70 or 100 mm
- Complementary outputs (1NO/1NC) on four-wire DC models
- Auto-configure output technology on four-wire DC models, which automatically detect how the sensor has been wired (NPN or PNP) and switch the sensor without user intervention
- Small diameter, two-wire AC models feature a selector switch inside the housing, enabling output contacts to be used as either NO or NC
- Robust design featuring vibration and impact-absorbing potting compound
- Ideal for extreme temperatures or high pressure washdown environments

Standards and Certifications

- UL Listed, E166051 (DC models only)
- UL Tested to Canadian safety standards
- CE (DC models only)
- RoHS Compliant

c UL us LISTED CE RoHS COMPLIANT

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

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

E56 Pancake Sensors

3

Pancake Style

Two-Wire Sensors

Voltage Type	Output Configuration	Output Contacts	Shielding	Sensing Range	Connector Style	Catalog Number
Pancake Style						
20–250 Vac 45/65 Hz	—	NO or NC	Unshielded	1.57 in (40 mm)	Screw terminals	**E56CDL40A2**
					3-pin mini-connector	**E56CDL40A2B1**
		NO or NC	Unshielded	2 in (50 mm)	Screw terminals	**E56CDL50A2E**
					3-pin mini-connector	**E56CDL50A2EB1**
90–260 Vac 45/65 Hz	—	NO	Unshielded	2.75 in (70 mm) ①	3-pin mini-connector	**E56CAL70B1S1**
		NO	Unshielded	3.94 in (100 mm) ①	3-pin mini-connector	**E56CAL100B1S1**

DC Four-Wire Sensors

Small Diameter

Voltage Type	Output Configuration	Output Contacts	Shielding	Sensing Range	Connector Style	Catalog Number
Small Diameter (79 x 79 x 39 mm)						
10–42 Vdc	NPN/PNP autoconfigure ②	1 NO and 1 NC	Shielded	1.57 in (40 mm)	DC screw	**E56ADL40SA**
					DC 4-pin mini	**E56ADL40SAE01**
					DC 4-pin micro	**E56ADL40SAD01**
			Unshielded	1.57 in (40 mm)	DC screw	**E56ADL40UA**
					DC 4-pin mini	**E56ADL40UAE01**
					DC 4-pin micro	**E56ADL40UAD01**
			Unshielded	2 in (50 mm)	DC screw	**E56ADL50UA**
					DC 4-pin mini	**E56ADL50UAE01**
					DC 4-pin micro	**E56ADL50UAD01**

Medium Diameter

Voltage Type	Output Configuration	Output Contacts	Shielding	Sensing Range	Connector Style	Catalog Number
Medium Diameter (110 x 110 x 41 mm)						
10–42 Vdc	NPN/PNP autoconfigure ②	1 NO and 1 NC	Unshielded	2.75 in (70 mm)	DC 4-pin mini	**E56BDL70UAE01**
					DC 4-pin micro	**E56BDL70UAD01**

Large Diameter

Voltage Type	Output Configuration	Output Contacts	Shielding	Sensing Range	Connector Style	Catalog Number
Large Diameter (172 x 172 x 68 mm)						
10–42 Vdc	NPN/PNP autoconfigure ②	1 NO and 1 NC	Unshielded	3.94 in (100 mm)	DC 4-pin mini	**E56CDL100UAE01**
					DC 4-pin micro	**E56CDL100UAD01**

Notes

See listing of compatible connector cables on **Page V8-T3-73**.

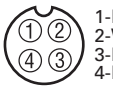
① Includes potentiometer for adjustment of sensing range.

② Autoconfigure technology allows the sensor to automatically adapt to NPN or PNP without user intervention.

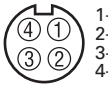
Compatible Connector Cables

Standard Cables ①

Micro-Style Straight Female

Current Rating at 600 V	Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number
Micro-Style, Straight Female							
—	AC	3-pin, 3-wire	22 AWG	6.0 ft (2m)	 1-Green 2-Red/Black 3-Red/White	**CSAS3F3CY2202**	**CSAS3F3RY2202**
				16.4 ft (5m)		**CSAS3F3CY2205**	**CSAS3F3RY2205**
				32.8 ft (10m)		**CSAS3F3CY2210**	**CSAS3F3RY2210**
—	DC	4-pin, 4-wire	22 AWG	6.0 ft (2m)	 1-Brown 2-White 3-Blue 4-Black	**CSDS4A4CY2202**	**CSDS4A4RY2202**
				16.4 ft (5m)		**CSDS4A4CY2205**	**CSDS4A4RY2205**
				32.8 ft (10m)		**CSDS4A4CY2210**	**CSDS4A4RY2210**

Mini-Style Straight Female

Current Rating at 600 V	Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number
Mini-Style, Straight Female							
13 A	—	3-pin, 3-wire	16 AWG	6.0 ft (2m)	 1-Green 2-Black 3-White	**CSMS3F3CY1602**	—
				13.1 ft (4m)		**CSMS3F3CY1604**	—
10 A	AC/DC	4-pin, 4-wire	16 AWG	6.0 ft (2m)	 1-Black 2-Blue 3-Brown 4-White	**CSMS4A4CY1602**	—
				13.1 ft (4m)		**CSMS4A4CY1604**	—
				19.7 ft (6m)		**CSMS4A4CY1606**	—

Note

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

Technical Data and Specifications

Two-Wire

Description	AC Two-Wire Small Diameter	Medium Diameter	Large Diameter
Operating voltage	20–250 Vac	20–250 Vac	20–250 Vac
Load current (maximum)	400 mA	400 mA	400 mA
Off-state leakage	At or above 32 °F (0 °C): <1.7 mA; below 32 °F (0 °C): 2.0 mA	At or above 32 °F (0 °C): <1.7 mA; below 32 °F (0 °C): 2.0 mA	At or above 32 °F (0 °C): <1.7 mA; below 32 °F (0 °C): 2.0 mA
Voltage drop	<10 V (5 V nominal)	<10 V (5 V nominal)	<10 V (5 V nominal)
Outputs	NO or NC (switch selectable)	NO or NC by model	NO or NC by model
Sensing range (maximum)	50 mm	70 mm	100 mm
Range adjustment	Not adjustable	Potentiometer adjustable down to 50% of rated maximum range	Potentiometer adjustable down to 50% of rated maximum range
Standard target size (mild steel)	150 mm	210 mm	300 mm
Frequency of operation	30 Hz	10 Hz	10 Hz
Repeatability	<3%	<3%	<3%
Hysteresis (maximum)	10–15%	10–15%	10–15%
Time delay before availability	300 ms	300 ms	300 ms
Circuit protection	Short-circuit protection with auto reset	Short-circuit protection with auto reset	Short-circuit protection with auto reset
Operating temperature	–13 to 158 °F (–25 to 70 °C) ①	–13 to 158 °F (–25 to 70 °C) ①	–13 to 158 °F (–25 to 70 °C) ①
Temperature drift	±10%	±10%	±10%
Enclosure rating	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67)	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67)	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67)
Indicator LEDs	Output status	Output status	Output status
Materials of construction	PPS housing	PPS housing; aluminum baseplate	PPS housing; aluminum baseplate

Four-Wire

Description	DC Four-Wire Small Diameter	Medium Diameter	Large Diameter
Operating voltage	10–42 Vdc	10–42 Vdc	10–42 Vdc
Load current (maximum)	300 mA	300 mA	300 mA
Burden current	<25 mA	<25 mA	<25 mA
Off-state leakage	<150 µA per output	<150 µA per output	<150 µA per output
Voltage drop	<2.5 V	<2.5 V	<2.5 V
Outputs	1 NO/1 NC (complementary)	1 NO/1 NC (complementary)	1 NO/1 NC (complementary)
Sensing range (maximum)	50 mm	70 mm	100 mm
Range adjustment	Not adjustable	Potentiometer adjustable down to 50% of rated maximum range	Potentiometer adjustable down to 50% of rated maximum range
Standard target size (mild steel)	150 mm	210 mm	300 mm
Frequency of operation	70 Hz	40 Hz	30 Hz
Repeatability	<3%	<3%	<3%
Hysteresis (maximum)	10–15%	10–15%	10–15%
Time delay before availability	300 ms	300 ms	300 ms
Circuit protection	Short-circuit protection with auto reset	Short-circuit protection with auto reset	Short-circuit protection with auto reset
Operating temperature	–13 to 158 °F (–25 to 70 °C) ①	–13 to 158 °F (–25 to 70 °C) ①	–13 to 158 °F (–25 to 70 °C) ①
Temperature drift	±10%	±10%	±10%
Enclosure rating	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67)	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67)	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67)
Indicator LEDs	Green: power; Red: output status	Green: power; Red: output status	Green: power; Red: output status
Materials of construction	PPS housing	PPS housing; aluminum baseplate	PPS housing; aluminum baseplate

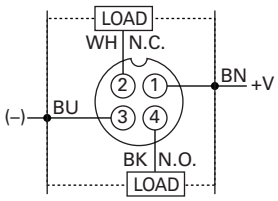
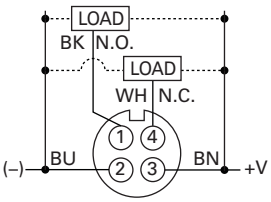
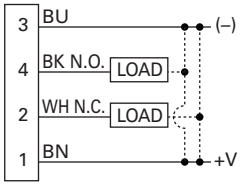
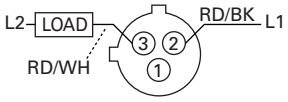
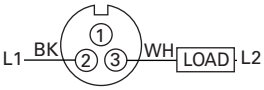
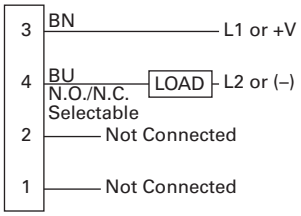
Note

① Small diameter DC unshielded models are rated at –40 °F (–40 °C). All other models can be operated at –40 °F (–40 °C), but range drift will occur.

Wiring Diagrams

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

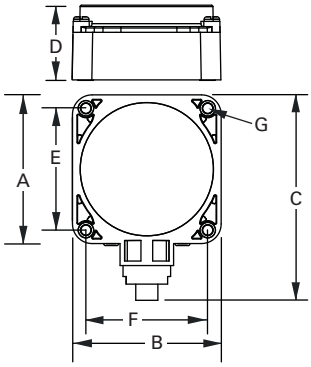
E56 Pancake Sensors

Voltage Type	Micro-Connector Models	Mini-Connector Models	Screw Terminal Models
DC four-wire	 *AutoConfigure enables load to be wired to +V or (–)*	 *AutoConfigure enables load to be wired to +V or (–)*	 *AutoConfigure enables load to be wired to +V or (–)*
AC two-wire			

Dimensions

Approximate Dimensions in Inches (mm)

E56 Pancake Sensors



Model	A (Depth)	B (Width)	C (Depth)	D (Height)	E (Mounting)	F (Mounting)	G (Diameter)
Small Diameter Models							
Micro-connector	3.13 (79.0)	3.13 (79.0)	4.32 (110.0)	1.54 (39.0)	2.56 (65.0)	2.56 (65.0)	0.21 (5.0)
Mini-connector	3.13 (79.0)	3.13 (79.0)	4.67 (119.0)	1.54 (39.0)	2.56 (65.0)	2.56 (65.0)	0.21 (5.0)
Screw terminal	3.13 (79.0)	3.13 (79.0)	3.87 (92.0)	1.54 (39.0)	2.56 (65.0)	2.56 (65.0)	0.21 (5.0)
Medium Diameter Models							
Micro-connector	4.35 (110.0)	4.35 (110.0)	4.94 (125.4)	1.63 (41.0)	3.625 (92.0)	3.625 (92.0)	0.218 (5.5)
Mini-connector	4.35 (110.0)	4.35 (110.0)	5.29 (134.4)	1.63 (41.0)	3.625 (92.0)	3.625 (92.0)	0.218 (5.5)
Large Diameter Models							
Micro-connector	6.75 (171.5)	6.75 (171.5)	7.26 (184.4)	2.66 (67.5)	5.875 (149.0)	5.875 (149.0)	0.266 (7.0)
Mini-connector	6.75 (171.5)	6.75 (171.5)	7.61 (193.3)	2.66 (67.5)	5.875 (149.0)	5.875 (149.0)	0.266 (7.0)

Nonmetallic Tubular Sensors

Contents

Nonmetallic Tubular Sensors

Product Description

E55 Tubular Inductive Proximity Sensors by Eaton's Electrical Sector are constructed of corrosion resistant PBT plastic. They are ideally suited for wash down applications such as those found in food processing plants. They are available in 12 mm, 18 mm and 30 mm diameters, shielded or unshielded. Shielded units can be embedded in metallic surfaces.

Features

- Models available that operate on two-wire AC or three-wire DC power
- Threaded tubular housings in three diameters allow easy integration into new and existing applications
- Nonmetallic construction offers excellent resistance to corrosion
- Output indicator LED is standard on all models

Standards and Certifications

- CE
- RoHS Compliant

CE RoHS COMPLIANT

⚠ 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

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

Nonmetallic Tubular Sensors

Two-Wire Sensors ①

	Operating Voltage	Sensing Range (Sn)	Shielding	Connection Type	NO Output Catalog Number	NC Output Catalog Number
12 mm 	**12 mm Diameter**					
	20–250 Vac 50/60 Hz	2 mm	Shielded	2-meter cable	**E55CAL12A2**	**E55CBL12A2**
		4 mm	Unshielded	2-meter cable	**E55CAL12A2E**	**E55CBL12A2E**
18 mm 	**18 mm Diameter**					
	20–250 Vac 50/60 Hz	5 mm	Shielded	2-meter cable	**E55CAL18A2**	**E55CBL18A2**
		8 mm	Unshielded	2-meter cable	**E55CAL18A2E**	**E55CBL18A2E**
30 mm 	**30 mm Diameter**					
	20–250 Vac 50/60 Hz	10 mm	Shielded	2-meter cable	**E55CAL30A2**	**E55CBL30A2**
		15 mm	Unshielded	2-meter cable	**E55CAL30A2E**	**E55CBL30A2E**

Three-Wire Sensors ①

	Operating Voltage	Sensing Range (Sn)	Shielding	Connection Type	NO Output Catalog Number	NC Output Catalog Number
12 mm 	**12 mm Diameter**					
	10–30 Vdc	2 mm	Shielded (NPN)	2-meter cable	**E55CAL12T110**	**E55CBL12T110**
			Shielded (PNP)	2-meter cable	**E55CAL12T111**	**E55CBL12T111**
		4 mm	Unshielded (NPN)	2-meter cable	**E55CAL12T110E**	**E55CBL12T110E**
			Unshielded (PNP)	2-meter cable	**E55CAL12T111E**	**E55CBL12T111E**
18 mm 	**18 mm Diameter**					
	10–30 Vdc	5 mm	Shielded (NPN)	2-meter cable	**E55CAL18T110**	**E55CBL18T110**
			Shielded (PNP)	2-meter cable	**E55CAL18T111**	**E55CBL18T111**
		8 mm	Unshielded (NPN)	2-meter cable	**E55CAL18T110E**	**E55CBL18T110E**
			Unshielded (PNP)	2-meter cable	**E55CAL18T111E**	**E55CBL18T111E**
30 mm 	**30 mm Diameter**					
	10–30 Vdc	10 mm	Shielded (NPN)	2-meter cable	**E55CAL30T110**	**E55CBL30T110**
			Shielded (PNP)	2-meter cable	**E55CAL30T111**	**E55CBL30T111**
		15 mm	Unshielded (NPN)	2-meter cable	**E55CAL30T110E**	**E55CBL30T110E**
			Unshielded (PNP)	2-meter cable	**E55CAL30T111E**	**E55CBL30T111E**

Note

① For a selection of mounting brackets and other accessories for use with these sensors, see **Tab 8**, **section 8.2**.

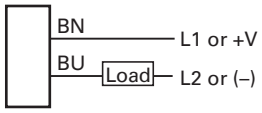
Technical Data and Specifications

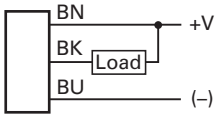
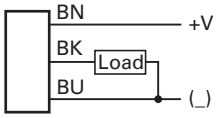
Nonmetallic Tubular Sensors

Description	Two-Wire AC Models	Three-Wire DC Models
Operating voltage	20–250 Vac, 50/60 Hz	10–30 Vdc
Maximum load current	150 mA	200 mA
Switching frequency		
12 mm	25 Hz	2000 Hz (shielded); 1000 Hz (unshielded)
18 mm	25 Hz	1000 Hz (shielded); 500 Hz (unshielded)
30 mm	25 Hz	300 Hz (shielded); 150 Hz (unshielded)
Protection	—	Short circuit and reverse polarity
Temperature range	–13 to 158 °F (–25 to 70 °C)	–13 to 158 °F (–25 to 70 °C)
Enclosure material	Polybutylene Teraphtalate (PBT)	Polybutylene Teraphtalate (PBT)
Enclosure rating	NEMA 3, 3S, 4, 4X, 13 (IP66)	NEMA 3, 3S, 4, 4X, 13 (IP66)
Indicator LED	Lights when output is ON	Lights when output is ON

Wiring Diagrams

Nonmetallic Tubular Sensors

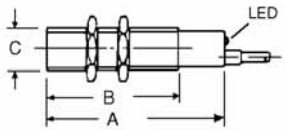
Operating Voltage	Output	Cable Models
Two-Wire Sensors		
20–250 Vac 50/60 Hz	All	

Operating Voltage	Output	Cable Models
Three-Wire Sensors		
10–30 Vdc	NPN	
	PNP	

Dimensions

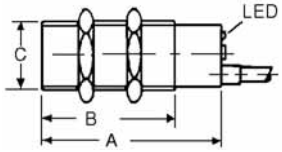
Approximate Dimensions in Inches (mm)

12 and 18 mm



A	B	Thread Size C
12 mm		
2.17 (55)	1.77 (45)	M12 x 1
18 mm		
2.17 (55)	1.77 (45)	M18 x 1

30 mm



A	B	Thread Size C
30 mm		
3.15 (80)	2.36 (60)	M30 x 1.5

E52 Cube Style Sensors

Contents

E52 Cube Style Sensors

Product Description

The E52 Cube Sensor from Eaton's Electrical Sector is a high performance inductive proximity sensor, providing long sensing ranges in a compact, industry-standard package.

The E52 Cube family features Eaton's Autoconfigure output technology, which automatically detects NPN or PNP wiring states and switches the sensor accordingly, without user intervention. The E52 also utilizes complementary outputs to further reduce the number of models needed to cover a wide array of inductive sensing applications. Individual power and output LEDs make installation and troubleshooting easy. Combine the above features with the range and five-way mounting flexibility of the E52 Cube family, and chances are there's an E52 solution to your sensing needs.

The E52 Cube was designed with the most heavy-duty applications in mind. Some of those applications include automotive manufacturing, aggregate machinery, and metalworking applications. Try the E52 Cube in some your most demanding applications today.

Application Description

Typical Applications

- Automotive manufacturing
- Metalworking
- Machinery OEMs
- Pipe and rod manufacturing
- Block and brick manufacturing equipment
- Amusement parks
- Heavy-duty trucks, cranes and lifts

Features

- Long inductive proximity ranges available (up to 40 mm sensing distance)
- Four-wire DC models have complementary outputs (1NO-1NC)
- Four-wire DC models use auto-configure technology, which allows the sensor to automatically adapt for NPN or PNP without user intervention
- Robust design featuring vibration and impact-absorbing potting compound
- Ideal for extreme temperatures or high pressure washdown environments

Standards and Certifications

- UL Listed, E166051
- UL Tested to Canadian safety standards
- CE (DC models only)
- RoHS Compliant

c UL us LISTED CE RoHS COMPLIANT

⚠ 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

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

E52 Cube Style Sensors

3

DC Four-Wire Sensors

Mini-Connector

Micro-Connector

Voltage Type	Output Configuration	Shielding	Output Type	Sensing Range	Connector Style	Catalog Number
Cube Package (40 x 40 x 40 mm)						
10–48 Vdc	NPN/PNP autoconfigure ①	Shielded	1 NO and 1 NC	15 mm	DC 4-pin micro	**E52Q-DL15SAD01** ⠿
					DC 4-pin mini	**E52Q-DL15SAE01** ⠿
		Unshielded	1 NO and 1 NC	15 mm	DC 4-pin micro	**E52Q-DL15UAD01** ⠿
					DC 4-pin mini	**E52Q-DL15UAE01** ⠿
10–48 Vdc	NPN/PNP autoconfigure ①	Shielded	1 NO and 1 NC	20 mm	DC 4-pin micro	**E52Q-DL20SAD01** ⠿
					DC 4-pin mini	**E52Q-DL20SAE01** ⠿
		Unshielded	1 NO and 1 NC	20 mm	DC 4-pin micro	**E52Q-DL20UAD01** ⠿
					DC 4-pin mini	**E52Q-DL20UAE01** ⠿
				25 mm	DC 4-pin micro	**E52Q-DL25UAD01** ⠿
					DC 4-pin mini	**E52Q-DL25UAE01** ⠿
				30 mm	DC 4-pin micro	**E52Q-DL30UAD01** ⠿
					DC 4-pin mini	**E52Q-DL30UAE01** ⠿
				35 mm	DC 4-pin micro	**E52Q-DL35UAD01** ⠿
					DC 4-pin mini	**E52Q-DL35UAE01** ⠿
				40 mm	DC 4-pin micro	**E52Q-DL40UAD01** ⠿
					DC 4-pin mini	**E52Q-DL40UAE01** ⠿

Compatible Connector Cables

Standard Cables ②

Micro-Style Straight Female

Current Rating at 600 V	Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number
Micro-Style, Straight Female							
—	DC	4-pin, 4-wire	22 AWG	6.0 ft (2m)	 1-Brown 2-White 3-Blue 4-Black	**CSDS4A4CY2202**	**CSDS4A4RY2202**
				16.4 ft (5m)		**CSDS4A4CY2205**	**CSDS4A4RY2205**
				32.8 ft (10m)		**CSDS4A4CY2210**	**CSDS4A4RY2210**

Mini-Style Straight Female

Current Rating at 600 V	Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number
Mini-Style, Straight Female							
10 A	AC/DC	4-pin, 4-wire	16 AWG	6.0 ft (2m)	 1-Black 2-Blue 3-Brown 4-White	**CSMS4A4CY1602**	—
				13.1 ft (4m)		**CSMS4A4CY1604**	—
				19.7 ft (6m)		**CSMS4A4CY1606**	—

Notes

⠿ See listing of compatible connector cables above.

① Autoconfigure technology allows the sensor to automatically adapt to NPN or PNP without user intervention.

② For a full selection of connector cables, see **Tab 10**, **section 10.1**.

Technical Data and Specifications

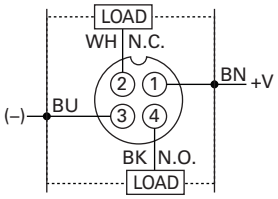
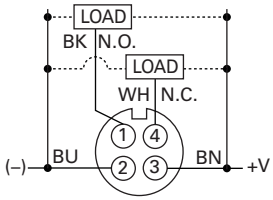
E52 Cube Style Sensors

Description	DC Four-Wire
Operating voltage	10–48 Vdc
Load current (maximum)	300 mA
Burden current	<25 mA
Off-state leakage	<150 µA per output
Voltage drop	<2.5 V
Outputs	1 NO/1 NC (complementary)
Standard target size (mild steel)	120 mm
Frequency of operation	100 Hz
Repeatability	<3%
Hysteresis (maximum)	10–15%
Time delay before availability	300 ms
Circuit protection	Short-circuit protection with auto reset
Operating temperature ①	–25 to 158 °F (–25 to 70 °C)
Temperature drift	±10%
Enclosure rating	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67, IP68)
Indicator LEDs	Green: power; Red: output status
Material of construction	Zinc alloy housing, PPS, PC

Wiring Diagrams

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

E52 Cube Style Sensors

Voltage Type	Micro-Connector	Mini-Connector
DC four-wire	 *AutoConfigure enables load to be wired to +V or (–)*	 *AutoConfigure enables load to be wired to +V or (–)*

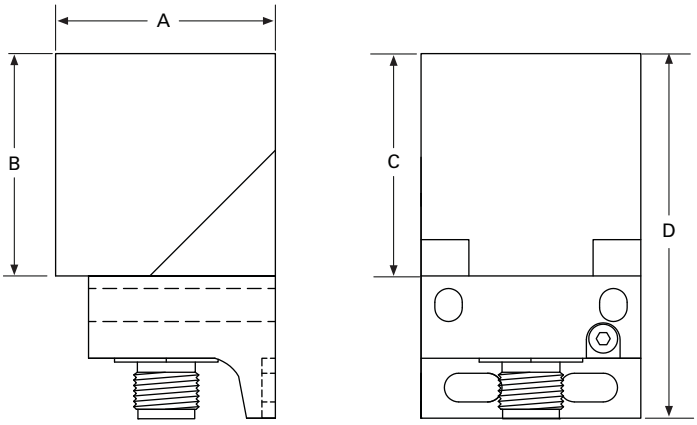
Note

① Will operate at –40 °F (–40 °C), but range drift will occur.

Dimensions

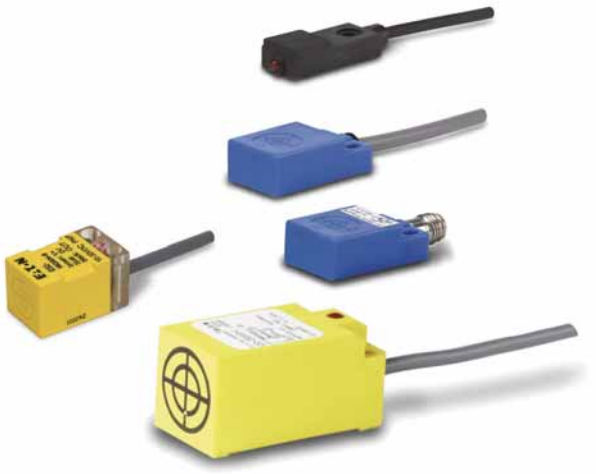
Approximate Dimensions in Inches (mm)

E52 Cube Style Sensors



Model	Width A	Depth B	Height C	Overall Height D
Micro-connector	1.57 (40)	1.57 (40)	1.57 (40)	2.725 (69.2)
Mini-connector	1.57 (40)	1.57 (40)	1.57 (40)	2.965 (75.3)

E52 Rectangular Style Sensors



Contents

E52 Rectangular Style Sensors

Product Description

Rectangular E52 Inductive Proximity Sensors from Eaton's Electrical Sector feature a small, thin, compact space-saving design for applications where tubular type sensors cannot be used. Sensors are self-contained for direct connection to a logic circuit, relay, counter, programmable controller, and so on.

Features

- Small, low-profile design for use in space restrictive applications
- Three-wire DC operation
- Choose from a variety of sizes, and side or end sensing configurations
- Output indicator included on all models
- Epoxy filled cavities stop fluids from contacting any electrical component
- Convenient mounting holes integrated into each sensor housing

Standards and Certifications

- CE (except E52RAL)
- RoHS Compliant

CE RoHS COMPLIANT

⚠ 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

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

E52 Rectangular Style Sensors

Three-Wire Models

	Voltage	Sensing Range	Frequency	Shielding	Connection Type	NO Output Catalog Number	NC Output Catalog Number
R12 Side Sensing	**R12 Side Sensing**						
	12–24 Vdc	0.12 in (3 mm)	Standard	Shielded (NPN)	1-meter cable	**E52RAL12T110**	—
				Shielded (PNP)		**E52RAL12T111**	—
			Alternate	Shielded (NPN)	1-meter cable	**E52RAL12T110AF**	—
				Shielded (PNP)		**E52RAL12T111AF**	—
Q16 End Sensing	**Q16 End Sensing**						
	12–30 Vdc	0.20 in (5 mm)	Standard	Unshielded (NPN)	2-meter cable	**E52-16QS04-C**	**E52-16QS04-C1**
				Unshielded (PNP)	2-meter cable	**E52-16QS04-B**	**E52-16QS04-B1**
R18 Side Sensing	**R18 Side Sensing**						
	10–30 Vdc	0.16 in (4 mm)	Standard	Unshielded (NPN)	2-meter cable	**E52-18RU04-C**	**E52-18RU04-C1**
					3-pin nano-connector	**E52-18RU04-CN** ⓝ	**E52-18RU04-C1N** ⓝ
				Unshielded (PNP)	2-meter cable	**E52-18RU04-B**	**E52-18RU04-B1**
					3-pin nano-connector	**E52-18RU04-BN** ⓝ	**E52-18RU04-B1N** ⓝ
Q25 End Sensing	**Q25 End Sensing**						
	10–30 Vdc	0.39 in (10 mm)	Standard	Shielded (NPN)	2-meter cable	**E52-25QS10-C**	**E52-25QS10-C1**
				Shielded (PNP)	2-meter cable	**E52-25QS10-B**	**E52-25QS10-B1**

Compatible Connector Cables

Standard Cables ①

	Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number
Nano-Style Straight Female	**Nano-Style, Straight Female**						
	DC	3-pin	24 AWG	6.0 ft (2m)	 1-Brown 3-Blue 4-Black	**CSNS3A3CY2402**	**CSNS3A3RY2402**

Technical Data and Specifications

E52 Rectangular Style Sensors

Description	Specification
Input current	Less than 10 mA
Load current	100 mA maximum
Switching rate	500 operations per second
Circuit protection	Short circuit
Ambient temperature range	–13 to 130 °F (–10 to 55 °C)
Enclosure rating	NEMA 1, 2, 3, 3S, 4, 12 (IEC IP66)
Enclosure material	PBT composition
Output indicator LED	Lights when output is ON

Notes

ⓝ See listing of compatible connector cables above.

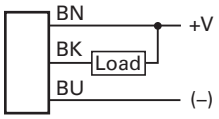
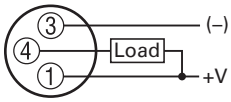
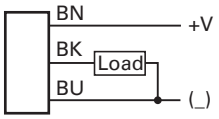
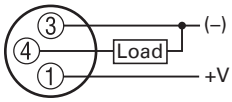
① For a full selection of connector cables, see **Tab 10**, **section 10.1**.

3

Wiring Diagrams

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

E52 Rectangular Style Sensors

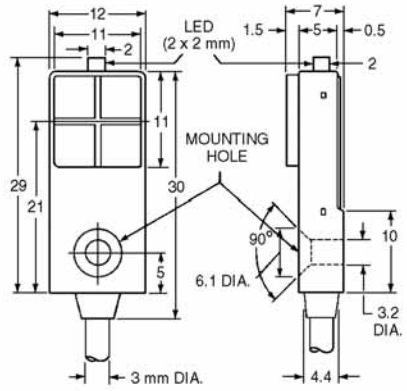
Operating Voltage	Output	Cable Models	Nano-Connector Models (Face View Male Shown)
Three-Wire Sensors			
DC	NPN		
	PNP		

Dimensions

Approximate Dimensions in Inches (mm) except where noted

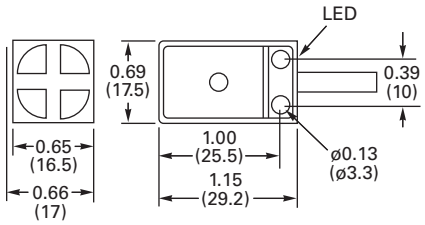
E52 Rectangular Style Sensors

R12

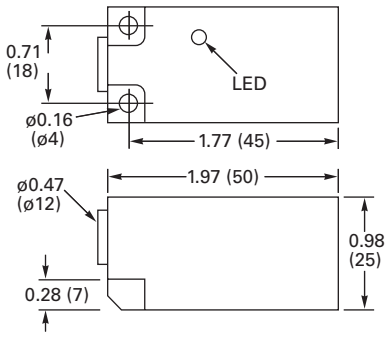


Note: Dimensions are mm only.

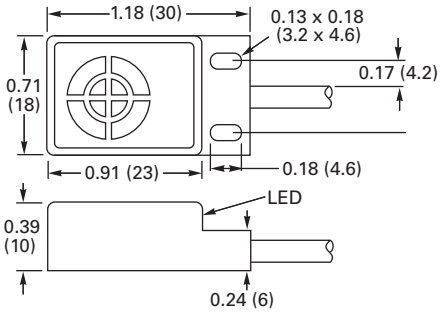
Q16

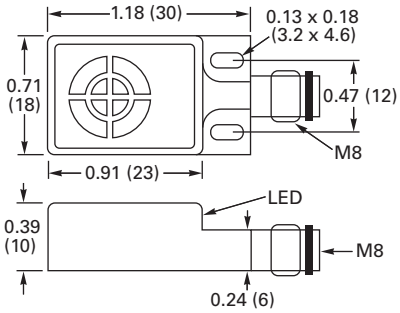


Q25



R18





E55 Limit Switch Style Sensors with Nonmetallic Housings

Contents

E55 Limit Switch Style Sensors with Nonmetallic Housings

Product Description

These sensors from Eaton's Electrical Sector feature PBT resin housings for high resistance to corrosion. The housing is sized to offer a direct replacement for standard limit switches. The unique sensing head is factory assembled for top sensing, but can be easily converted in the field to any one of four side sensing positions. Models are available with sensing ranges from 15 mm to 40 mm. The sensors can be wired for NO or NC operation.

Features

- Nonmetallic housing offers excellent resistance to corrosion
- Same form factor and mounting as standard limit switches for easy retrofit
- Sensor head features five sensing positions (top and all four sides) that can be easily changed in the field
- Long sensing ranges up to 40 mm

Standards and Certifications

- CE
- RoHS Compliant

CE RoHS COMPLIANT

⚠ 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.

Product Selection

E55 Limit Switch Style Sensors

E55 Limit Switch

Two-Wire Sensors

Voltage Type	Sensing Range (Sn)	Shielding	Output	Connection Type	Catalog Number
35–250 Vac	15 mm	Shielded	NO or NC	Terminal wiring	**E55BLT1C**
	20 mm	Unshielded			**E55BLT1D**
	30 mm				**E55BLT1E**
	40 mm				**E55BLT1F**

For the most current information on this product, visit our Web site: 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.

Technical Data and Specifications

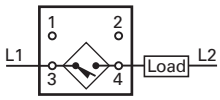
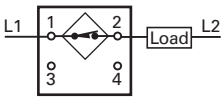
E55 Limit Switch Style Sensors

Description	Specification
Operating voltage	35–250 Vac
Maximum load current	400 mA
Switching frequency	25 Hz maximum
Leakage current	1.8 mA
Voltage drop	8V maximum
Inrush	5 A maximum for 20 ms
Indicator LEDs	Two LEDs: One lights when power is ON, the other lights when output is ON
Operating temperature	–13 to 158 °F (–25 to 70 °C)
Enclosure ratings	NEMA 4, 4X, 6, 12, 13 (IP67)
Housing material	PBT resin

Wiring Diagrams

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

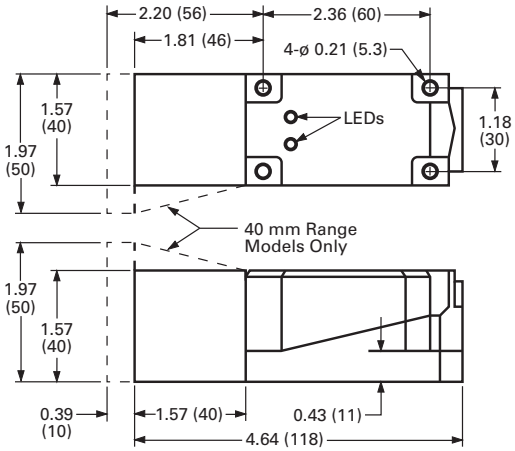
E55 Limit Switch Style Sensors

Operating Voltage	Output	Terminal Models
Two-Wire Sensors		
35–250 Vac ①	NO	
	NC	

Dimensions

Approximate Dimensions in Inches (mm)

E55 Limit Switch Style Sensors



Note

① Switches are shipped as NO configuration. Internal jumpers must be moved to program for NC.

3

E51 Modular Limit Switch Style Sensors

Contents

E51 Modular Limit Switch Style Sensors

Product Description

The E51 Inductive Proximity Sensor family from Eaton's Electrical Sector combines high performance with a familiar limit switch style housing. Modular, plug-in components provide application flexibility, ease of maintenance, less downtime and reduced inventory. Choose from two-wire sensors with AC/DC operation, or four-wire sensors in either AC or DC styles. Connection options include terminal, mini-connector or various lengths of cable.

Choose from standard sensors that detect all types of metallic targets. The next page provides more detail on these sensors.

Features

- Rugged construction is ideal for industrial environments
- Viton gaskets ensure a positive seal and high resistance to industry chemicals
- Direct replacement for worn out limit switches
- Sensor heads and bodies feature captive screws to eliminate loss
- All sensor heads include a selector switch to program output function to either NO or NC
- Sensor bodies feature bifurcated engagement prongs for a reliable connection when plugging into receptacle stabs
- Engagement key between sensor body and receptacle prevents improper assembly
- Sensors accommodate both U.S. and DIN mounting dimensions
- Wiring terminals feature captive pressure plate saddles for #18 to #12 AWG wire. A green screw identified ground terminal is also included
- Logic modules are available to provide additional control functions

Standards and Certifications

- UL Listed, E166051, E183975
- CSA Certified, 50513
- RoHS Compliant

LISTED

RoHS COMPLIANT

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

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

Standard Sensors—Assembled with Terminal Wiring

Standard E51 sensors feature long sensing ranges and a choice of top or side sensing heads. Alternate frequency units eliminate interference when mounted close to standard frequency units. Order sensors in component form, as assembled plug-in units, or in a sealed version where the sensor body is factory assembled to an epoxy filled receptacle with tamper-proof screws to ensure a lasting seal.

Assembled Sensor

Assembled Sensors—Standard (with Terminal Wiring)

Sensor Body and Receptacle

	Two-Wire Sensors	Four-Wire Sensors			
Operating voltage	20–264 Vac/dc	120 Vac		10–30 Vdc	
Output	NO or NC ①	NO and NC complementary		NO and NC complementary	
Sensor body	**E51SAL**	**E51SCL**	**E51SCN** Accepts logic modules ②	**E51SPL** PNP	**E51SNL** NPN
Receptacle ③	**E51RA**	**E51RC**	**E51RCB**	**E51RN**	**E51RN**

Sensor Heads ①

Top Sensing

Side Sensing

Sensing Range	Shielding	Frequency	Sensor Head Only Catalog Number	Assembled Sensors with Head, Sensor Body and Receptacle Catalog Number				
Top Sensing								
0.51 in (13 mm)	Shielded	Standard	**E51DT1**	**E51ALT1**	**E51CLT1**	**E51CNT1**	**E51PLT1**	**E51NLT1**
		Alternate	**E51DT2**	**E51ALT2**	**E51CLT2**	**E51CNT2**	**E51PLT2**	**E51NLT2**
0.94 in (24 mm)	Unshielded	Standard	**E51DT5**	**E51ALT5**	**E51CLT5**	**E51CNT5**	**E51PLT5**	**E51NLT5**
		Alternate	**E51DT6**	**E51ALT6**	**E51CLT6**	**E51CNT6**	**E51PLT6**	**E51NLT6**
Side Sensing								
0.51 in (13 mm)	Shielded	Standard	**E51DS1**	**E51ALS1**	**E51CLS1**	**E51CNS1**	**E51PLS1**	**E51NLS1**
		Alternate	**E51DS2**	**E51ALS2**	**E51CLS2**	**E51CNS2**	**E51PLS2**	**E51NLS2**
0.94 in (24 mm)	Unshielded	Standard	**E51DS5**	**E51ALS5**	**E51CLS5**	**E51CNS5**	**E51PLS5**	**E51NLS5**
		Alternate	**E51DS6**	**E51ALS6**	**E51CLS6**	**E51CNS6**	**E51PLS6**	**E51NLS6**

Notes

① All sensor heads feature a programmable output selector switch for NO or NC operation. Operation is as follows:

For This Output Type:	Set Selector Position: "TARGET"	"NO TARGET"
NO	Target present	Target absent
NC	Target absent	Target present

② Logic module must be ordered separately, see **Page V8-T3-91**. These sensor bodies are rated NEMA 4, 4X and 13.

③ Receptacles feature terminal wiring with a 1/2 in NPT thread at the conduit entrance. Other connection options are available:

Connection Option		Catalog Number	Code Suffix	Example
20 mm thread at the conduit entrance		—	**20**	**E51ALT120**
Mini-connector termination with epoxy filled receptacle, see **Page V8-T3-92** for additional receptacle options	Two-wire, 3-pin connector	**CSMS3F3CY1602**	**P3**	**E51ALT1P3**
	Four-wire, 5-pin connector	**CSMS5D5CY1602**	**P5**	**E51CLT1P5**
Pre-wired cable with epoxy filled receptacle	8 ft long	—	**S**	**E51ALT1S**
	12 ft long	—	**S12**	**E51ALT1S12**
	20 ft long	—	**S20**	**E51ALT1S20**

Standard Sensors—Assembled with Receptacles

Sensor body is attached to receptacle with tamper-proof screws.

Assembled Sensor

Assembled Sensors—Standard (with Epoxy Filled Receptacles and Pre-wired Cables)

Sensor Base Type with 8 ft Cable ②

		Two-Wire Sensors	Four-Wire Sensors		
	Operating voltage	20–264 Vac/dc	120 Vac	10–30 Vdc	
				NO and NC complementary	
	Output	NO or NC ①	NO and NC complementary	PNP	NPN

Sensor Heads ①	Sensing Range	Shielding	Frequency	Sensor Head Only Catalog Number	Assembled Sensors with Head and Sensor Base Catalog Number			
Top Sensing	**Top Sensing**							
	0.51 in (13 mm)	Shielded	Standard	**E51DT1**	**E51ALT16P**	**E51CLT16P**	**E51PLT16P**	**E51NLT16P**
			Alternate	**E51DT2**	**E51ALT26P**	**E51CLT26P**	**E51PLT26P**	**E51NLT26P**
	0.94 in (24 mm)	Unshielded	Standard	**E51DT5**	**E51ALT56P**	**E51CLT56P**	**E51PLT56P**	**E51NLT56P**
			Alternate	**E51DT6**	**E51ALT66P**	**E51CLT66P**	**E51PLT66P**	**E51NLT66P**
Side Sensing	**Side Sensing**							
	0.51 in (13 mm)	Shielded	Standard	**E51DS1**	**E51ALS16P**	**E51CLS16P**	**E51PLS16P**	**E51NLS16P**
			Alternate	**E51DS2**	**E51ALS26P**	**E51CLS26P**	**E51PLS26P**	**E51NLS26P**
	0.94 in (24 mm)	Unshielded	Standard	**E51DS5**	**E51ALS56P**	**E51CLS56P**	**E51PLS56P**	**E51NLS56P**
			Alternate	**E51DS6**	**E51ALS66P**	**E51CLS66P**	**E51PLS66P**	**E51NLS66P**

Sensor Heads

Sensor Heads ①

	Sensing Range	Shielding	Frequency	Target Material	Catalog Number
Top Sensing	**Top Sensing**				
	0.51 in (13 mm)	Shielded	Standard	All metals	**E51DT1**
			Alternate		**E51DT2**
	0.94 in (24 mm)	Unshielded	Standard	All metals	**E51DT5**
			Alternate		**E51DT6**
Side Sensing	**Side Sensing**				
	0.51 in (13 mm)	Shielded	Standard	All metals	**E51DS1**
			Alternate		**E51DS2**
	0.94 in (24 mm)	Unshielded	Standard	All metals	**E51DS5**
			Alternate		**E51DS6**

Notes

① All sensor heads feature a programmable output selector switch for NO or NC operation. Operation is as follows:

For This Output Type:	Set Selector Position: "TARGET"	"NO TARGET"
NO	Target present	Target absent
NC	Target absent	Target present

② Switch bases feature 8 ft of SOOW-A cable. Other connection options are available:

Connection Option ③	Suffix	Example
Mini-connector mounted on 3 ft (0.9m) pigtail cable	**T**	**E51ALT16PT**
Mini-connector mounted to switch base	**C**	**E51ALT16PC**
Cable longer than 8 feet, add required length in 1 ft increments to listed catalog number—20 ft maximum	**Length in ft**	**E51ALT16P12 for 12 ft**

③ See listing of compatible connector cables on **Page V8-T3-93**.

Sensor Bodies

Two-Wire Sensors

	Operating Voltage	Output	Protection	Output Rating Continuous	Type	Catalog Number
AC/DC	**AC/DC**					
	20–264 Vac/dc, 50/60 Hz	1 output, load powered, NO or NC, programmable from head; off state leakage current: <1.7 mA at 120 Vac/dc, <2.0 mA at 240 Vac	Latching short circuit and overload	0.5 A	—	**E51SAL** ①

Four-Wire Sensors

	Operating Voltage	Output	Protection	Output Rating Continuous	Type	Catalog Number
AC (E51SCN Shown)	**AC**					
	120 Vac, 50/60 Hz	2 complementary outputs, line powered, NO and NC	—	1.0 A to 158 °F (70 °C), linearly derated to 0.6 A at 176 °F (80 °C)	—	**E51SCL** ①
				1.0 A to 113 °F (45 °C), linearly derated to 0.3 A at 176 °F (80 °C)	—	**E51SCN** ②③
DC	**DC**					
	10–30 Vdc	2 complementary outputs, line powered, NO and NC	Reverse polarity	0.6 A to 104 °F (40 °C), linearly derated to 0.36A at 176 °F (80 °C)	NPN	**E51SNL** ①
					PNP	**E51SPL** ①

Logic Module

Logic Module (for E51SCN Sensor Body Only)

	Type	Description	Timing Range ④	Catalog Number
Logic Module ⑤	ON and OFF delay	Adjustable delay between time object is sensed and time switch function occurs Adjustable delay between time object leaves sensing field and time switch transfers back to non-sensing state	0.15 to 15.0 seconds	**E51MTB**
				

Notes

① This sensor body is available in a factory-sealed, non plug-in configuration (with 8-ft cable), add **6P** to listed catalog number. Example: E51SAL**6P**.
② Sensor body is black. E51SCN sensor bodies are rated NEMA 4, 4X and 13.
③ This sensor accepts logic modules, as seen in chart above.
④ Repeatability of the timing cycle is ±1% at constant voltage, ambient temperature and reset time.
⑤ Reset time is 25 ms minimum. Rated NEMA 4, 4X and 13.

Receptacles

Receptacles

	Description	Style	Details	Cable Length	Conduit Entrance 1/2 in NPT Catalog Number	Conduit Entrance 20 mm Catalog Number
Surface Mount	**Surface Mount**					
	Conduit entrance, front or rear mounting	Two-wire, AC/DC	—	—	**E51RA**	**E51RA20**
		Four-wire, AC	Gray	—	**E51RC**	**E51RC20**
			Black ①	—	**E51RCB**	**E51RCB20**
		Four-wire, DC	—	—	**E51RN**	**E51RN20**
Mini-Connector	**Mini-Connector**					
	Epoxy filled receptacle with pre-wired mini-connector	Two-wire, AC/DC	3-pin	—	**E51RAP3** ⓐ	—
		Four-wire, AC	5-pin	—	**E51RCP5** ⓑ	—
		Four-wire, DC	5-pin	—	**E51RNP5** ⓑ	—
Pigtail with Mini-Connector	**Pigtail with Mini-Connector**					
	Epoxy filled receptacle with mini-connector mounted on 3 ft (0.9m) cable	Two-wire, AC/DC	3-pin	3 ft (0.9m)	**E51RAPT3** ⓐ	—
		Four-wire, AC	5-pin	3 ft (0.9m)	**E51RCPT5** ⓑ	—
		Four-wire, DC	5-pin	3 ft (0.9m)	**E51RNPT5** ⓑ	—
Pre-Wired Cable	**Pre-Wired Cable**					
	Epoxy filled receptacle with pre-wired 16 gauge, yellow jacketed, type SOOW-A cable. Cable enters through hole threaded for conduit	Two-wire, AC/DC	3-conductor	8 ft (2.4m)	**E51RAS**	**E51RA20S**
				12 ft (3.6m)	**E51RAS12**	—
				20 ft (6m)	**E51RAS20**	—
		Four-wire, AC	5-conductor	8 ft (2.4m)	**E51RCS**	**E51RC20S**
				12 ft (3.6m)	**E51RCS12**	—
				20 ft (6m)	**E51RCS20**	—
		Four-wire, DC	5-conductor	8 ft (2.4m)	**E51RNS**	**E51RN20S**
				12 ft (3.6m)	**E51RNS12**	—
				20 ft (6m)	**E51RNS20**	—

Notes

ⓐⓑ See listing of compatible connector cables on **Page V8-T3-93**.

① Black receptacle is for color compatibility with E51SCN sensor body.

Compatible Connector Cables

Standard Cables ①

	Current Rating at 600 V	Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	Catalog Number
Micro-Style Straight Female 	**Micro-Style, Straight Female**						
	13 A	—	3-pin	16 AWG	6 ft (2m)	 1-Green 2-Black 3-White	**CSMS3F3CY1602**
	10 A	AC/DC	4-pin, four-wire	16 AWG	6 ft (2m)	 1-Black 2-Blue 3-Brown 4-White	**CSMS4A4CY1602**
	8 A	—	5-pin	16 AWG	6 ft (2m)	 1-White 2-Red 3-Green 4-Orange 5-Black	**CSMS5D5CY1602**

Accessories

E51 Modular Limit Switch Style Sensors

	Description	Catalog Number
One Hole 	**Universal Mounting Bracket**	
	One hole, includes mounting hardware, stainless steel	**E51KH2**
Two Holes 	Two holes, includes mounting hardware, steel	**E51KH4**
Machine Mounting Bracket 	**Machine Mounting Bracket**	
	Zinc die cast construction	**E50KH3**
Stand-Off Mounting Bracket 	**Stand-Off Mounting Bracket**	
	Steel construction	**E51KH3**
Remote Sensor Head Assembly 	**Remote Sensor Head Assembly**	
	Permits mounting sensor head up to 3 ft (0.9m) from sensor body	**E51KRM**

Dimensions, see **Page V8-T3-95**.

Note

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

Technical Data and Specifications

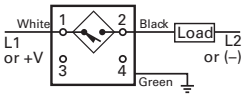
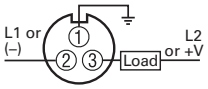
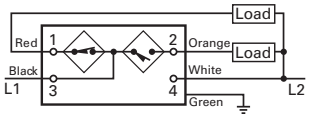
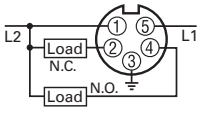
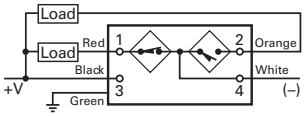
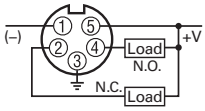
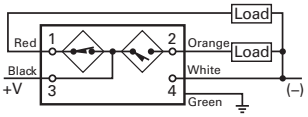
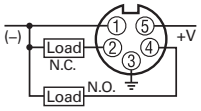
E51 Modular Limit Switch Style Sensors

Description	Specification
Output rating (NEMA D150)	
AC/DC models	0.5 A continuous
AC models	1 A continuous
DC models	0.6 A continuous
Protection	Latching short-circuit protection on two-wire AC/DC models; DC models: resettable short-circuit protection
Switching rate	AC models: 15 Hz; DC models: 50 Hz
Indicator LEDs	Lights when output is ON. One LED for each output
Alternate frequency	Standard and alternate frequencies allow side-by-side operation without interference
Enclosure material	Zinc die cast
Gasket material	Viton
Enclosure ratings	NEMA 3, 3S, 4, 4X, 6, 6P, 12 and 13 (IP67); E51SCN sensor body only: NEMA 4, 4X and 13
Hazardous locations ratings	
Class I	Division II—GRPS ABCD
Class II	Division II—GRPS F and G
Class III	Division 2
Temperature range	–13 to 158 °F (–25 to 70 °C)
Torque requirements	Switch body screws: 25–30 in-lbs; sensing head screws: 14–18 in-lbs
Vibration	10–55 Hz, 1 mm amplitude
Shock	30 g, 11 ms, 1/2 sine wave
Humidity	95% non-condensing
Burden current	<25 mA
OFF-state leakage	DC version: 120 µA; two-wire AC: 1.9 mA maximum; three-wire AC: 1.1 mA
ON-state leakage	<2.5 Vdc
Power-up delay	<150 ms

Wiring Diagrams

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

E51 Modular Limit Switch Style Sensors

Operating Voltage	Output	Terminal and Cable Models	Mini-Connector Models (Face View Male Shown)
Two-Wire Sensors			
20–264 Vac or Vdc 50/60 Hz	NO or NC (NO shown, can be changed to NC using switch on sensor head)		
Four-Wire Sensors			
120 Vac 50/60 Hz	NO and NC ①		
10–30 Vdc	NO and NC NPN ①		
	NO and NC PNP ①		

Note

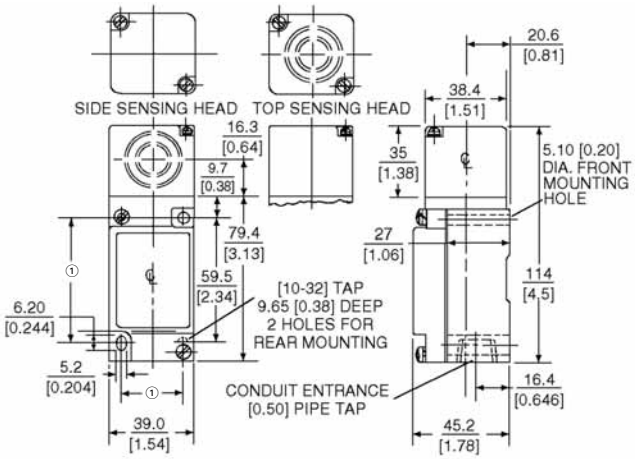
① Changing output switch on sensor head will reverse output function (NO becomes NC, and NC becomes NO).

Dimensions

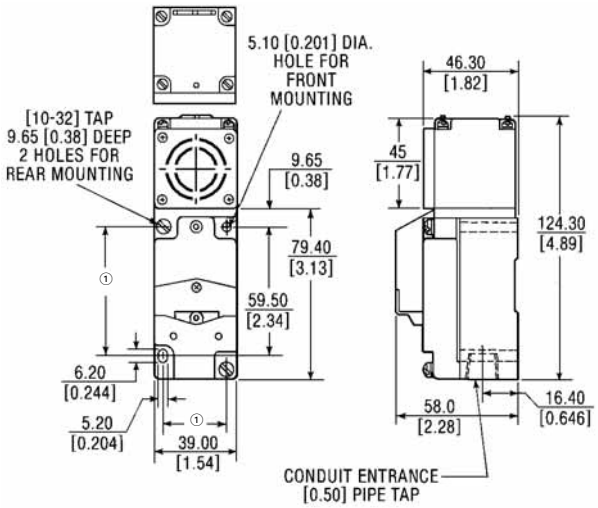
Approximate Dimensions in mm [in]

E51 Modular Limit Switch Style Sensors

Standard Sensors



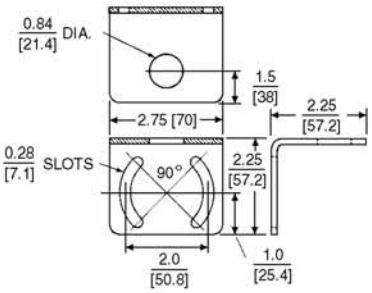
Sensor with Logic Module



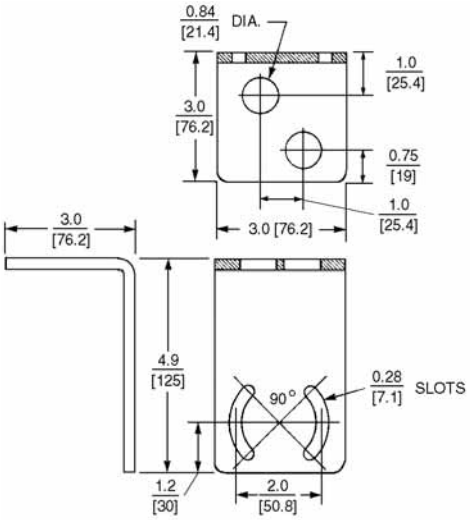
Accessories

Approximate Dimensions in Inches [mm]

Universal Mounting Bracket—One Hole



Universal Mounting Bracket—Two Holes



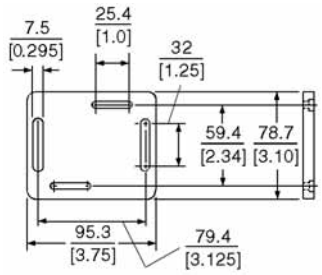
Note

① Can accommodate both U.S., 29.4 [1.16] x 59.5 [2.34] and DIN, 30 [1.18] x 60 [2.36], mounting dimensions are in mm [in].

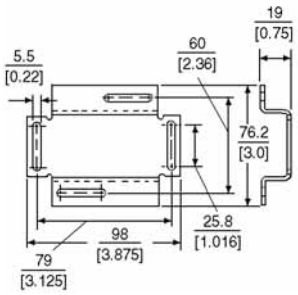
3

Approximate Dimensions in mm [in]

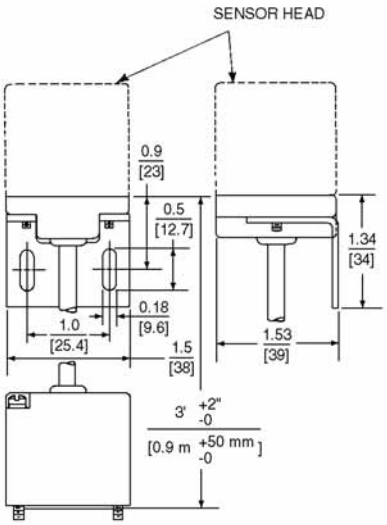
Machine Mounting Bracket



Stand-Off Mounting Bracket



Remote Sensor Head Assembly



E51 Limit Switch Style, Factory Sealed 6P+ Sensors

Contents

E51 Limit Switch Style, Factory Sealed 6P+ Sensors

Product Description

E51 6P+ Inductive Proximity Sensors from Eaton's Electrical Sector are fully sealed, pre-wired and designed specifically to ensure reliability under the most adverse of environmental conditions. They have been proven to withstand the penetrating properties of dirt, dust, grit, extreme temperatures and humidity. The unitized design eliminates plug-in connections that can lead to reliability problems in rugged environments.

Features

- The one-piece body and sensing head are both epoxy filled to protect internal components from contamination
- The head is hard-wired to the sensor body to ensure trouble-free performance
- Choose from top and side sensing heads
- Side sensing heads can be rotated to any of four positions
- Mounting dimensions allow direct replacement of worn out limit switches
- Rugged zinc die cast construction withstands physical abuse
- Connection options include pre-wired cable, body mounted connector and pigtail connector

Standards and Certifications

- UL Listed, E166051
- CSA Certified, 50513
- RoHS Compliant

c UL us LISTED

RoHS COMPLIANT

⚠ 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

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

Unitized Sensors

3

Assembled Sensor with 8 ft Cable ①

Sensor Heads ②

Top Sensing ②

Side Sensing ②

Factory Sealed 6P+ Assembled Sensors

			Two-Wire Sensors		Four-Wire Sensors		
		Operating voltage	20–264 Vac/dc		120 Vac	10–30 Vdc	
		Output	NO	NC	NO and NC complementary	NO and NC complementary PNP	NPN
Sensing Range	**Shielding**	**Frequency** ③	**Assembled Sensor with Head, Sensor Body and Receptacle Catalog Number**				
Top Sensing							
0.51 in (13 mm)	Shielded	Standard	**E51ALT16PU**	**E51BLT16PU**	**E51CLT16PU**	**E51PLT16PU**	**E51NLT16PU**
		Alternate	**E51ALT26PU**	**E51BLT26PU**	**E51CLT26PU**	**E51PLT26PU**	**E51NLT26PU**
0.94 in (24 mm)	Unshielded	Standard	**E51ALT56PU**	**E51BLT56PU**	**E51CLT56PU**	**E51PLT56PU**	**E51NLT56PU**
		Alternate	**E51ALT66PU**	**E51BLT66PU**	**E51CLT66PU**	**E51PLT66PU**	**E51NLT66PU**
Side Sensing							
0.51 in (13 mm)	Shielded	Standard	**E51ALS16PU**	**E51BLS16PU**	**E51CLS16PU**	**E51PLS16PU**	**E51NLS16PU**
		Alternate	**E51ALS26PU**	**E51BLS26PU**	**E51CLS26PU**	**E51PLS26PU**	**E51NLS26PU**
0.94 in (24 mm)	Unshielded	Standard	**E51ALS56PU**	**E51BLS56PU**	**E51CLS56PU**	**E51PLS56PU**	**E51NLS56PU**
		Alternate	**E51ALS66PU**	**E51BLS66PU**	**E51CLS66PU**	**E51PLS66PU**	**E51NLS66PU**

Compatible Connector Cables

Mini-Style Straight Female

Standard Cables ⑥

Current Rating at 600 V	Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	Catalog Number
Mini-Style, Straight Female						
13 A	—	3-pin	16 AWG	6 ft (2m)	 1-Green 2-Black 3-White	**CSMS3F3CY1602**
10 A	—	4-pin	16 AWG	6 ft (2m)	 1-Black 2-Blue 3-Brown 4-White	**CSMS4A4CY1602**
8 A	AC/DC	5-pin, 5-wire	16 AWG	6 ft (2m)	 1-Black 2-Blue 3-Orange 4-Brown 5-White	**CSMS5A5CY1602**

Notes

① Switch bases feature 8 ft of SOOW-A cable. Other connection options are available:

Connection Option ④	Instructions	Example
Mini-connector mounted on 3 ft (0.9m) pigtail cable (3-pin for two-wire sensors; 5-pin for four-wire sensors)	Add the letter **T** before **U**	**E51ALT16PTU**
Mini-connector mounted to switch base (3-pin for two-wire sensors; 5-pin for four-wire sensors)	Add the letter **C** before **U**	**E51ALT16PCU**
Cable longer than 8 ft, add required length in 1 ft increments to listed catalog number—20 ft maximum	Add length in feet to end of catalog number	**E51ALT16PU12** ⑤

② Sensor head is hard wired to sensor body and cannot be detached. Side sensing head can be unfastened and rotated to any of four positions.

③ Sensor heads feature color coded target symbols: Yellow for standard frequency; Green for alternate frequency.

④ See listing of compatible connector cables above.

⑤ For 12 ft.

⑥ For a full selection of connector cables, see **Tab 10**, **section 10.1**.

Accessories

E51 Limit Switch Style, Factory Sealed 6P+ ①

	Description	Catalog Number
One Hole 	**Universal Mounting Bracket**	
	Includes mounting hardware, stainless steel	**E51KH2**
Two Holes 	Includes mounting hardware, steel	**E51KH4**
Machine Mounting Bracket 	**Machine Mounting Bracket**	
	Zinc die cast construction	**E50KH3**
Stand-Off Mounting Bracket 	**Stand-Off Mounting Bracket**	
	Steel construction	**E51KH3**
	Dimensions, see **Page V8-T3-100**.	

Technical Data and Specifications

E51 Limit Switch Style, Factory Sealed 6P+

Description	Specification
Output rating (NEMA D150)	
AC/DC models	0.5 A continuous
AC models	1 A continuous
DC models	0.6 A continuous
Protection	Latching short-circuit protection on two-wire AC/DC and three-wire DC models
Switching rate	AC models: 15 Hz; DC models: 50 Hz
Indicator LEDs	Lights when output is ON. One LED for each output
Alternate frequency	Standard and alternate frequencies allow side-by-side operation without interference
Enclosure material	Cast metal
Gasket material	Zinc die cast
Enclosure ratings	NEMA 3, 3S, 4, 4X, 6, 6P, 12 and 13 (IP68)
Temperature range	–13 to 158 °F (–25 to 70 °C)
Torque requirements	Switch body screws: 25–30 in-lbs; sensing head screws: 14–18 in-lbs
OFF-state leakage	DC version: 120 µA; two-wire AC: 1.9 mA maximum; three-wire AC: 1.1 mA
ON-state leakage	<2.5 Vdc

Note

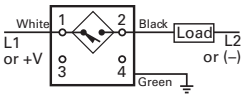
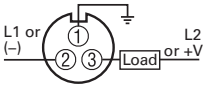
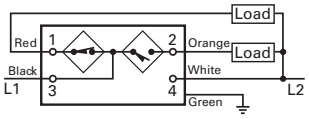
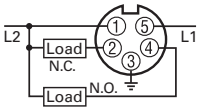
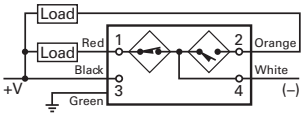
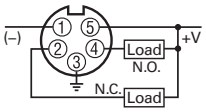
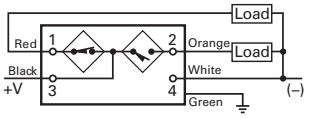
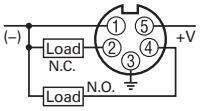
① For a full selection of connector cables, see **Tab 10**, **section 10.1**.

Wiring Diagrams

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

E51 Limit Switch Style, Factory Sealed 6P+

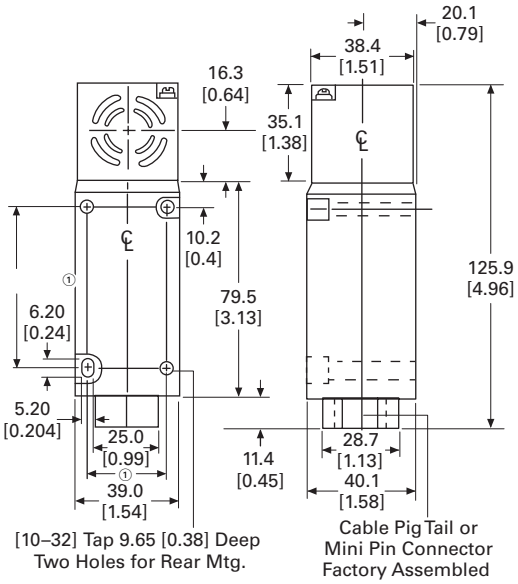
3

Operating Voltage	Output	Cable Models	Mini-Connector Models (Face View Male Shown)
Two-Wire Sensors			
20–264 Vac or Vdc 50/60 Hz	NO or NC (NO shown)		
Four-Wire Sensors			
120 Vac 50/60 Hz	NO and NC		
10–30 Vdc	NO and NC NPN		
	NO and NC PNP		

Dimensions

Approximate Dimensions in mm [in]

E51 Limit Switch Style, Factory Sealed 6P+



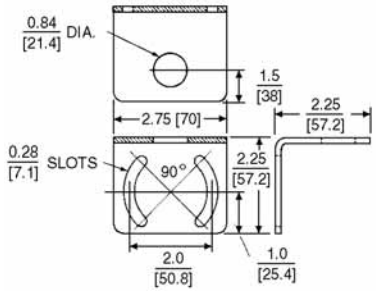
Note

① Can accommodate both U.S., 29.4 [1.16] x 59.5 [2.34] and DIN, 30 [1.18] x 60 [2.36], mounting dimensions.

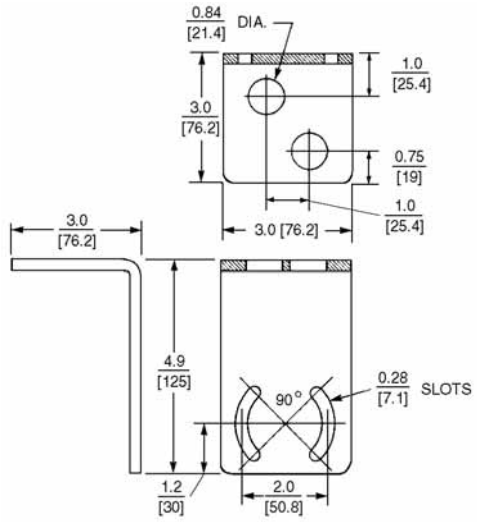
Approximate Dimensions in Inches [mm]

Accessories

Universal Mounting Bracket—One Hole

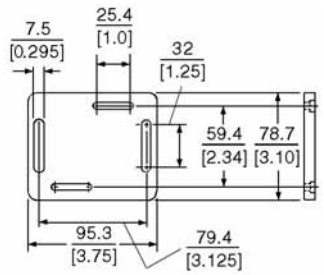


Universal Mounting Bracket—Two Holes

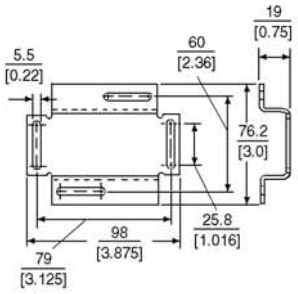


Approximate Dimensions in mm [in]

Machine Mounting Bracket



Stand-Off Mounting Bracket



Note

① Can accommodate both U.S., 29.4 [1.16] x 59.5 [2.34] and DIN, 30 [1.18] x 60 [2.36], mounting dimensions.