

## E51 Modular Limit Switch Style Sensors



## 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

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## Standards and Certifications

- UL Listed
- CSA Certified
- CE (where shown)

**⚠ DANGER**

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

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

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

For Application Assistance in the U.S. and Canada  
call 1-800-426-9184.

## 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



Operating voltage

##### Two-Wire Sensors

20–264 Vac/dc

##### Four-Wire Sensors

120 Vac

10–30 Vdc

Output

NO or NC <sup>①</sup>

NO and NC complementary

NO and NC complementary

Sensor body

**E51SAL**

**E51SCL**

**E51SCN**  
Accepts logic  
modules <sup>②</sup>

**E51SPL**  
PNP

**E51SNL**  
NPN

Receptacle <sup>③</sup>

**E51RA**

**E51RC**

**E51RCB**

**E51RN**

**E51RN**

#### Sensor Heads <sup>①</sup>

##### 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**

CE

**E51CLT1**

**E51CNT1**

**E51PLT1**

CE

**E51NLT1**

CE

Alternate

**E51DT2**

**E51ALT2**

CE

**E51CLT2**

**E51CNT2**

**E51PLT2**

CE

**E51NLT2**

CE

0.94 in  
(24 mm)

Unshielded

Standard

**E51DT5**

**E51ALT5**

CE

**E51CLT5**

**E51CNT5**

**E51PLT5**

CE

**E51NLT5**

CE

Alternate

**E51DT6**

**E51ALT6**

CE

**E51CLT6**

**E51CNT6**

**E51PLT6**

CE

**E51NLT6**

CE

##### Side Sensing

0.51 in  
(13 mm)

Shielded

Standard

**E51DS1**

**E51ALS1**

CE

**E51CLS1**

**E51CNS1**

**E51PLS1**

CE

**E51NLS1**

CE

Alternate

**E51DS2**

**E51ALS2**

CE

**E51CLS2**

**E51CNS2**

**E51PLS2**

CE

**E51NLS2**

CE

0.94 in  
(24 mm)

Unshielded

Standard

**E51DS5**

**E51ALS5**

CE

**E51CLS5**

**E51CNS5**

**E51PLS5**

CE

**E51NLS5**

CE

Alternate

**E51DS6**

**E51ALS6**

CE

**E51CLS6**

**E51CNS6**

**E51PLS6**

CE

**E51NLS6**

CE

#### Notes

<sup>①</sup> 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

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

<sup>③</sup> 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	—	<b>20</b>	<b>E51ALT120</b>
Mini-connector termination with epoxy filled receptacle, see <b>Page V8-T3-92</b> for additional receptacle options	Two-wire, 3-pin connector	<b>CSMS3F3CY1602</b>	<b>P3</b>
	Four-wire, 5-pin connector	<b>CSMS5D5CY1602</b>	<b>P5</b>
Pre-wired cable with epoxy filled receptacle	8 ft long	—	<b>S</b>
	12 ft long	—	<b>S12</b>
	20 ft long	—	<b>S20</b>

## 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)
<b>Two-Wire Sensors</b>			
20–264 Vac or Vdc 50/60 Hz	NO or NC (NO shown, can be changed to NC using switch on sensor head)		
<b>Four-Wire Sensors</b>			
120 Vac 50/60 Hz	NO and NC <sup>①</sup>		
10–30 Vdc	NO and NC NPN <sup>①</sup>		
	NO and NC PNP <sup>①</sup>		

#### Note

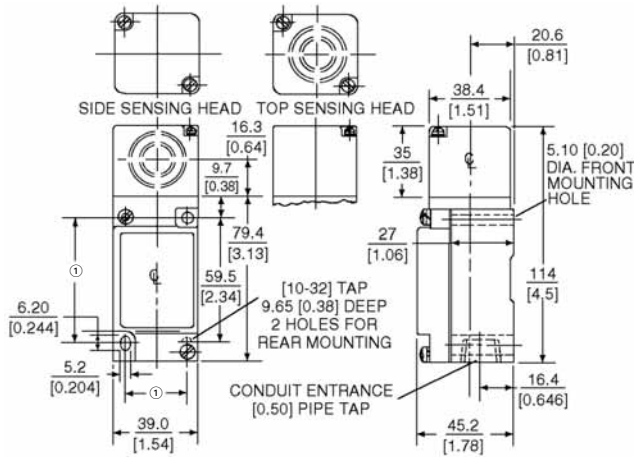
<sup>①</sup> Changing output switch on sensor head will reverse output function (NO becomes NC, and NC becomes NO).

### Dimensions

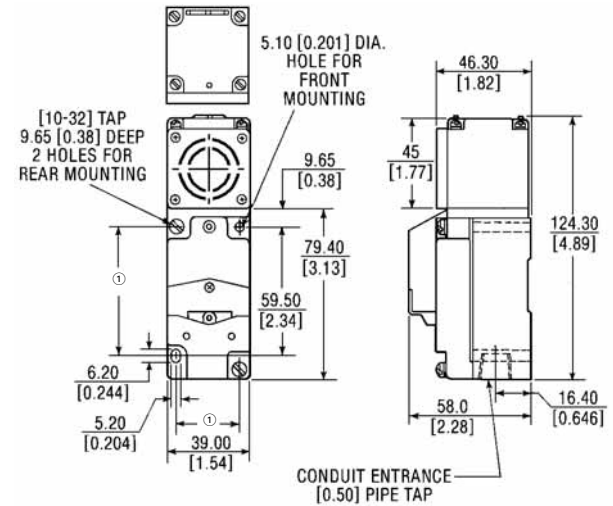
Approximate Dimensions in mm [in]

#### E51 Modular Limit Switch Style Sensors

##### Standard Sensors



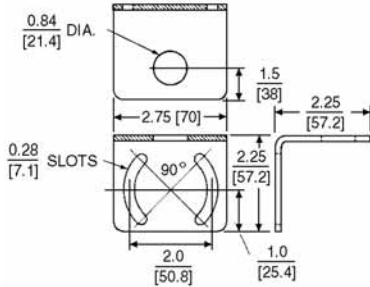
##### Sensor with Logic Module



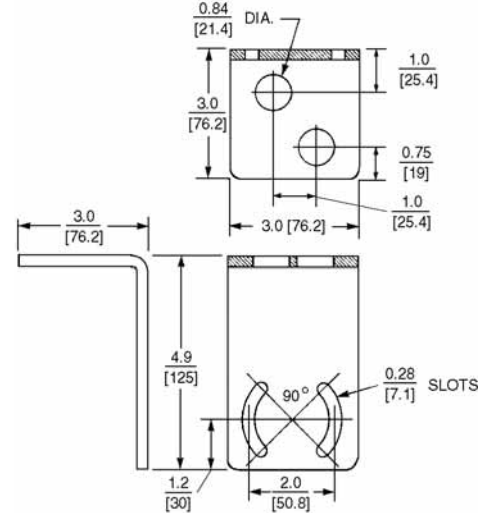
### Accessories

Approximate Dimensions in Inches [mm]

##### Universal Mounting Bracket—One Hole



##### Universal Mounting Bracket—Two Holes



### Note

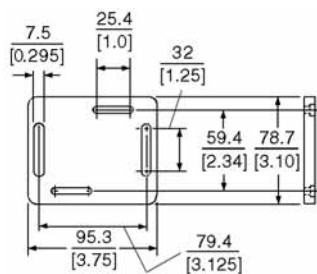
① Can accommodate both U.S., 29.4 [1.16] x 59.5 [2.34] and DIN, 30 [1.18] x 60 [2.36], mounting dimensions are in mm [in].

# 3.16 Inductive Proximity Sensors

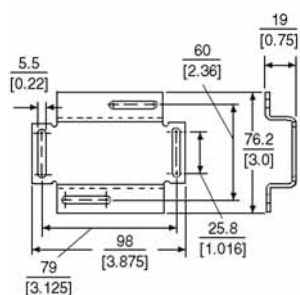
## E51 Modular Limit Switch Style Sensors

Approximate Dimensions in mm [in]

### Machine Mounting Bracket



### Stand-Off Mounting Bracket



### Remote Sensor Head Assembly

