OMRON

Inductive Proximity Sensor

E2ES

Proximity Sensor for Detecting All Metals Features One-Piece, Stainless Steel Construction for Exceptional Durability

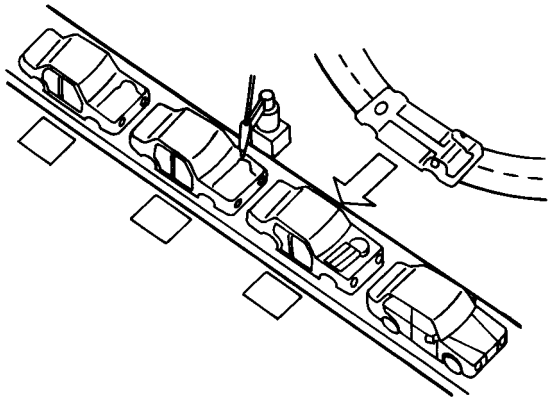
- Rugged stainless steel barrel and sensing face make sensor ideal for applications where occasional contact may be made with the sensor
- Special circuitry allows sensor to ignore metal chips and shaving buildup on sensing face
- DC two-wire connection simplifies wiring process

Ordering Information

Type	Size	Sensing distance	Output configuration	Part number
Non-shielded 	M18	4 mm	DC 2-wire (normally open)	**E2ES-X4D1**
	M30	8 mm		**E2ES-X8D1**

Application Example

AUTOMOBILE ASSEMBLY LINE



Specifications

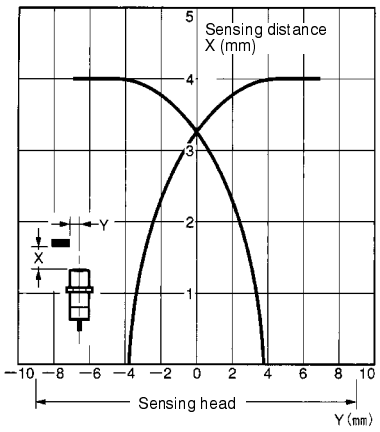
■ RATINGS/CHARACTERISTICS

Item	Type	DC 2-wire models	
	Part number	E2ES-X4D1	E2ES-X8D1
Sensing distance		4 mm±10%	8 mm±10%
Supply voltage (operating voltage range)		12 to 24 VDC, ripple (p-p) 10% max. (10 to 30 VDC)	
Leakage current		0.8 mA max.	
Sensing target		Ferrous metal (refer to *Engineering Data* for non-ferrous metal)	
Setting distance		0 to 2.8 mm	0 to 5.6 mm
Standard object (iron)		30 x 30 x 1 mm	54 x 54 x 1 mm
Differential travel		20% max. of sensing distance	
Response frequency		12 Hz	8 Hz
Control output		3 to 100 mA	
Circuit protection		Surge absorber, load short-circuit protection	
Indicator		Operation indicator (red LED), operation set indicator (green LED)	
Ambient temperature	Operating	0°C to 50°C (32°F to 122°F) with no icing	
Ambient humidity	Operating	35% to 95%	
Temperature influence		±20% max. of sensing distance at 23°C in temperature range of 0°C to 50°C	
Residual voltage		3.0 V max. (under load current of 100 mA with cable length of 2 m)	
Insulation resistance		50 MΩ min. (at 500 VDC) between current carrying parts and case	
Dielectric strength		1,000 VAC for 1 min between current carrying parts and case	
Vibration resistance		10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions	
Shock resistance		1,000 m/s^2 (approx. 100G) for 10 times each in X, Y, and Z directions	
Enclosure rating		IEC IP67	
Connection	Prewired	2-conductor cable, 2 m (6.56 ft) length	
Weight		Approx. 130 g	Approx. 190 g
Material	Case	SUS303	
	Sensing surface	SUS303	
	Nut	Iron	

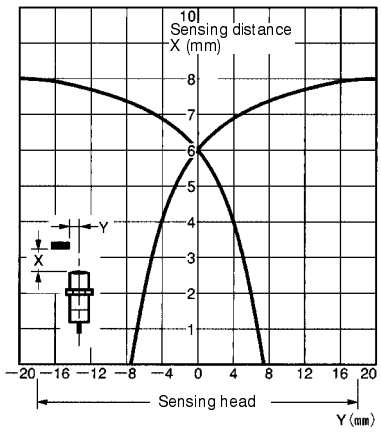
Engineering Data

■ OPERATING RANGE (TYPICAL)

E2ES-X4D1

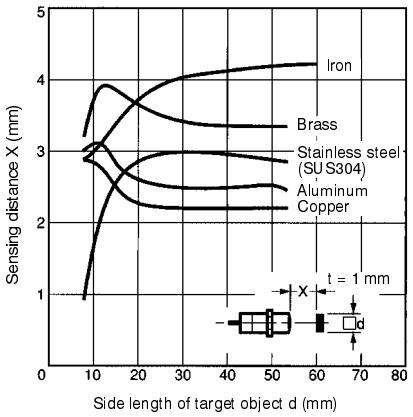


E2ES-X8D1

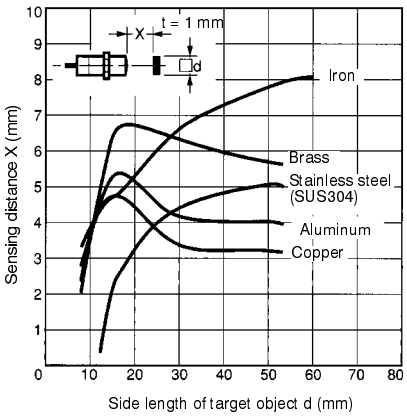


■ SENSING DISTANCE VS. TARGET OBJECT (TYPICAL)

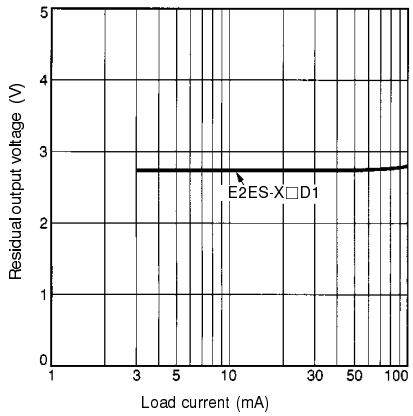
E2ES-X4D1



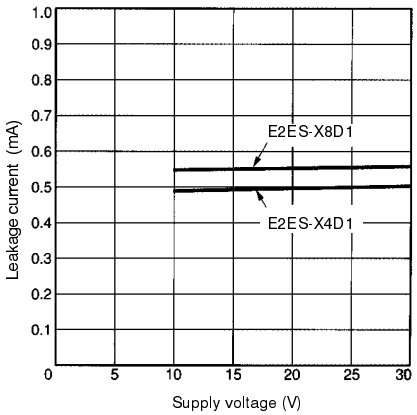
E2ES-X8D1



■ RESIDUAL OUTPUT VOLTAGE (TYPICAL)

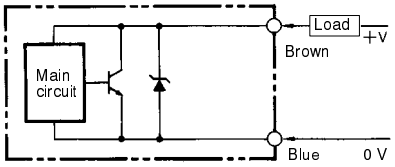


■ LEAKAGE CURRENT (TYPICAL)

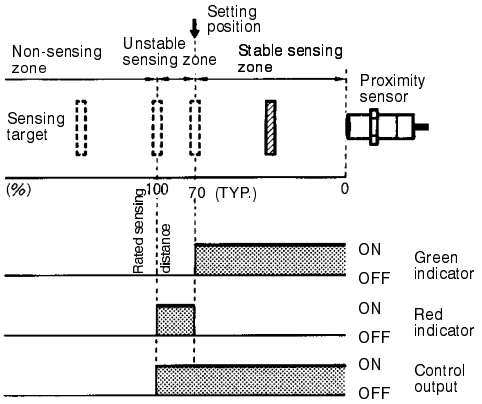


Operation

■ OUTPUT CIRCUIT



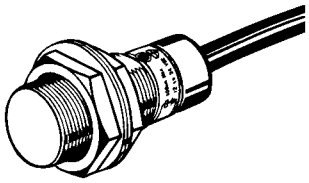
Note: The load can be connected to either the +V or 0V side.

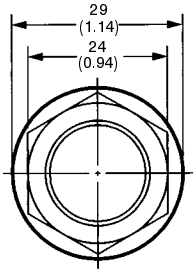


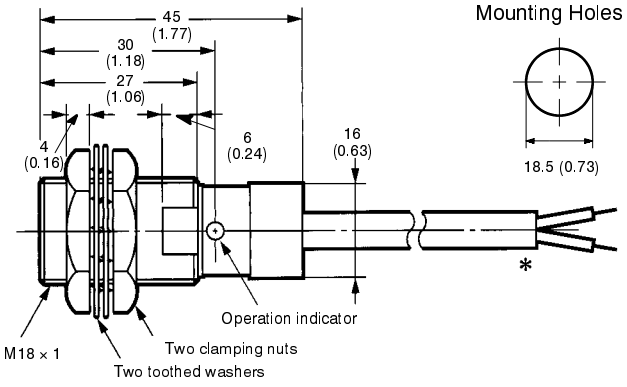
Dimensions

Unit: mm (inch)

■ E2ES-X4D1

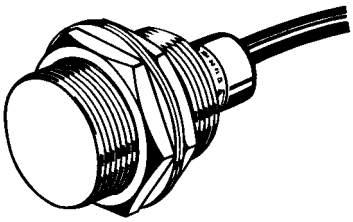


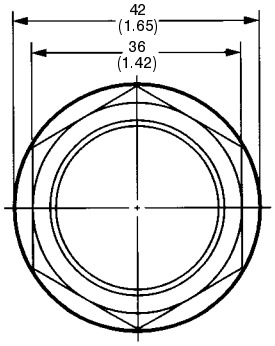


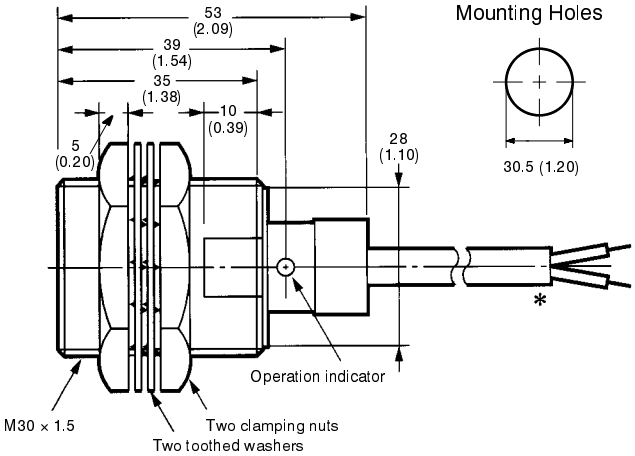


Note: *Vinyl-insulated round cable, 6 dia., 2 cores (0.12 dia. x 45)
Standard length: 2 m

■ E2ES-X8D1







Note: *Vinyl-insulated round cable, 6 dia., 2 cores (0.12 dia. x 45)
Standard length: 2 m

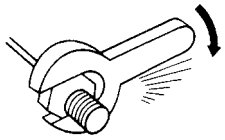
Precautions

■ TO ENSURE SAFE OPERATION

- Do not use the E2ES in places with flammable, explosive gases.
- Do not disassemble, repair, or modify the E2ES.
- Make sure that the power supply terminal polarity is correct.
- Do not apply AC voltage, or exceed the ratings for DC voltage, or the E2ES may be damaged or malfunction.

■ MOUNTING

Do not tighten the nut with force exceeding the torque provided in the following table. A toothed washer must be used with the nut.

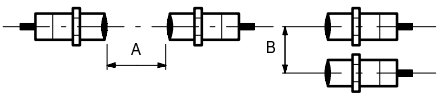


Permissible Tightening Torque

Part number	Torque
E2ES-X4D1	70 N • m (710 kgf • cm)
E2ES-X8D1	180 N • m (1,800 kgf • cm)

■ MUTUAL INTERFERENCE

If more than one E2ES is mounted face to face or in parallel, make sure that the distances between two units adjacent to each other are the same as, or larger than, the corresponding values shown in the following table.

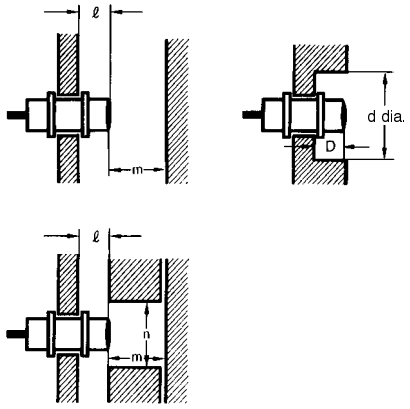


Mutual interference (mm)

Distance	Part number	
	E2ES-X4D1	E2ES-X8D1
A	40	60
B	50	100

■ EFFECTS OF SURROUNDING METAL

When mounting the E2ES within a metal panel, ensure that the corresponding clearances given in either of the following tables are maintained. These clearances vary depending on whether the nut provided is used.



Minimum Mounting Clearances

With Provided Nut (mm)

Part number	E2ES-X4D1		E2ES-X8D1	
Surrounding metal	Iron	Aluminum	Iron	Aluminum
Item				
ℓ	7	10	8	10
d	55	40	90	70
D	7	10	8	10
m	16	16	32	32
n	27	54	45	90

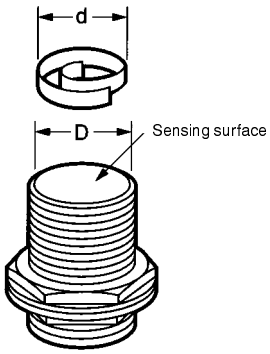
Without Provided Nut (mm)

Part number	E2ES-X4D1		E2ES-X8D1	
Surrounding metal	Iron	Aluminum	Iron	Aluminum
Item				
ℓ	10	15	10	20
d	55	40	90	70
D	10	15	10	20
m	16	16	32	32
n	27	54	45	90

■ METAL CHIPS AND SHAVINGS

The unique circuitry of the E2ES allows it to ignore the accumulation of metal chips or shavings on the face of the sensor while continuing normal operation. However, there are instances where this feature can be compromised, and the face of the sensor will need to be cleaned.

For Metal Chips

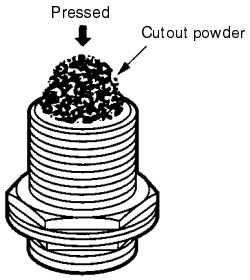


Part number	D (mm)	d (mm)
E2ES-X4D1	16	10
E2ES-X8D1	28	18

If a chip of size “d” or greater is on the face of the sensor, clean the sensor to assure proper operation.

For Metal Shavings

If the metal shavings accumulated on the sensor face are pressed on (through contact with sensing target or machine, etc.) the performance of the sensor may be compromised, and the sensor should be cleaned immediately.



NOTE: DIMENSIONS SHOWN ARE IN MILLIMETERS. To convert millimeters to inches divide by 25.4.

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