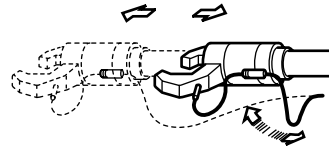


Small Proximity Sensors EM Series



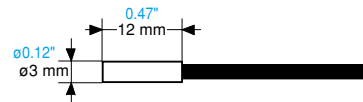
Flexible cable

The output cable is made of a high-tensile copper alloy giving it 5 times greater flexibility than conventional sheathed cables.



Compact sensor heads

With a sensor head diameter as small as 3 mm 0.12" for the cylindrical type and M5 for the threaded type, the EM Series sensor is an effective space-saver.



Can be mounted in close proximity

Alternate frequency models are available to prevent mutual interference, even when sensors are used in close proximity to each other.



Detecting capacitor leads



For standard certification and conformance list, see our website.
www.keyence.com/products/certified/

ASK KEYENCE

1-888-KEYENCE
www.keyence.com/ASKG

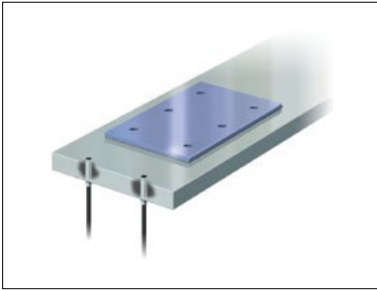


FREE DOWNLOAD

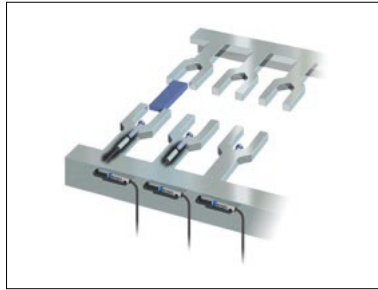
www.keyence.com/DLG

Free downloads for product and technical support are readily available in one convenient location

Applications



Detecting presence/absence of small holes










Confirming that a target is in transfer press grips



Detecting cam switch position

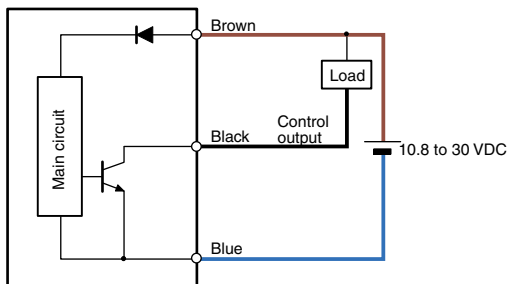
Specifications

Type	Shielded								
			Cylindrical		Threaded	Cylindrical		Threaded	
Model	NPN	EM-030	EM-038	EM-005	EM-054	EM-080	EM-010	EM-014	
	PNP	EM-030P	EM-038P	EM-005P	EM-054P	EM-080P	EM-010P	EM-014P	
Size		3 mm 0.12" dia.	3.8 mm 0.15" dia.	M5	5.4 mm 0.21" dia.	8 mm 0.31" dia.	M10	M14	
Appearance									
Detecting distance		0.6 mm 0.02" ±15%	0.8 mm 0.031" ±15%	1.0 mm 0.04" ±15%	1.2 mm 0.05" ±10%	2.0 mm 0.08" ±10%		4.0 mm 0.16" ±10%	
Detectable object		Ferrous metals (see Characteristics for non-ferrous metals)							
Standard target (iron, $t=1$ mm 0.04")		5 x 5 mm 0.20"			6 x 6 mm 0.24"	10 x 10 mm 0.39"		15 x 15 mm 0.59"	
Hysteresis		10% max. of detecting distance							
Response frequency		1.2 kHz							
Operation mode		N.O.							
Temperature fluctuation		±10% max. of detecting distance at +23°C (73.4°F), within -10 to +70°C (14 to 158°F)							
Control output		NPN/PNP: 200 mA (40 V) max., Residual voltage: 1 V max.							
Power supply		10.8 to 30 VDC, Ripple (P-P) 10% max. ¹⁾							
Current consumption		12 mA max.							
Enclosure rating		IP67							
Ambient temperature		-25 to +80°C (-13 to +176°F), No freezing							
Relative humidity		35 to 95%, No condensation							
Housing		Stainless steel						Cr-plated brass	
Weight (including nuts and 2-m 6.6' cable)		Approx. 36 g	Approx. 38 g	Approx. 40 g		Approx. 42 g	Approx. 50 g	Approx. 60 g	

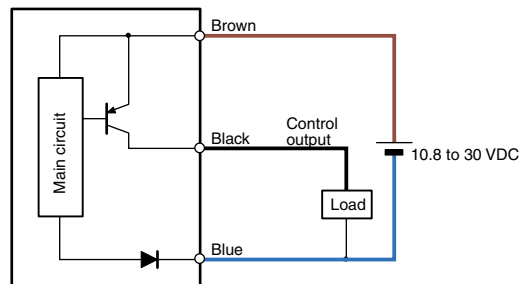
1. Make sure that the power voltage stays within 10.8 V to 30 V even if it is affected by ripple effects.

Input/Output Circuits

NPN

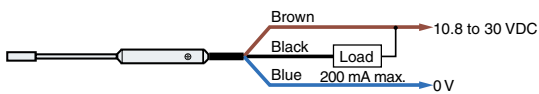


PNP

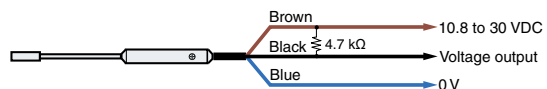


Connections

When driving a direct load (NPN output type)



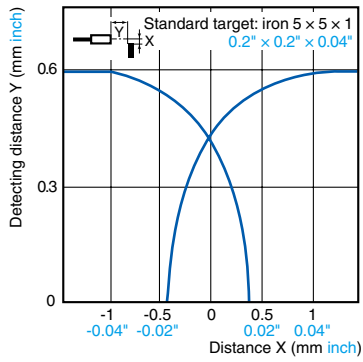
When connecting to a voltage input device (NPN output type)



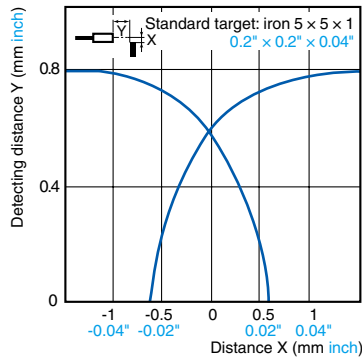
Low level is used when a target approaches.

Detecting range (Typical)

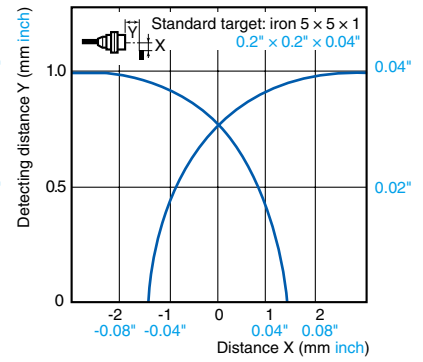
EM-030/030P



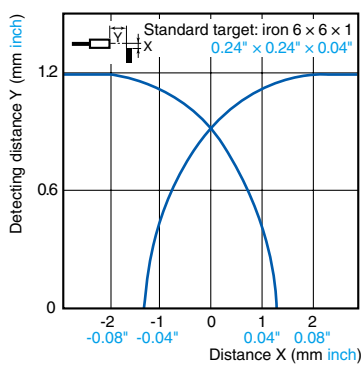
EM-038/038P



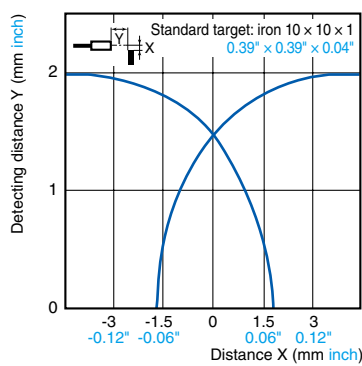
EM-005/005P



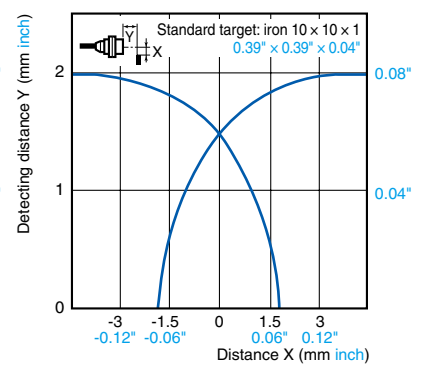
EM-054/054P



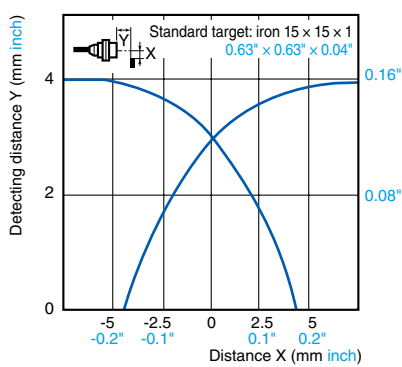
EM-080/080P



EM-010/010P

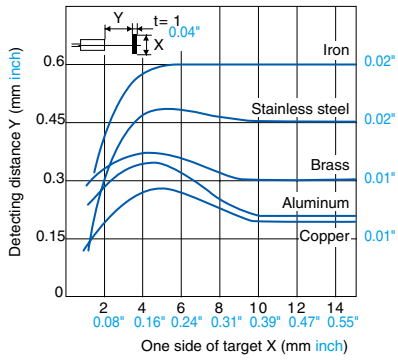


EM-014/014P

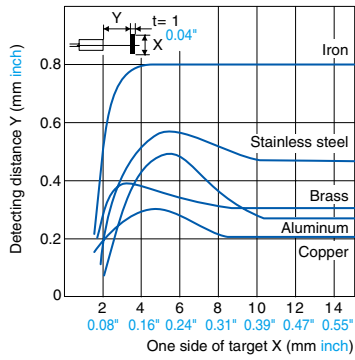


Detecting distance vs. size and material of target (Typical)

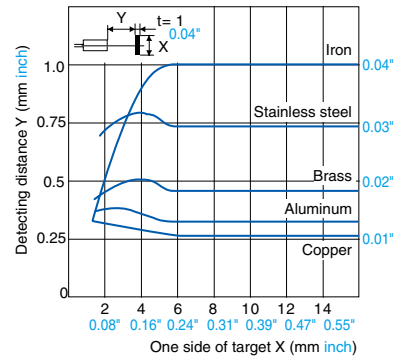
EM-030(P)



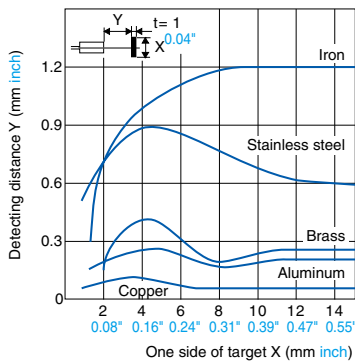
EM-038(P)



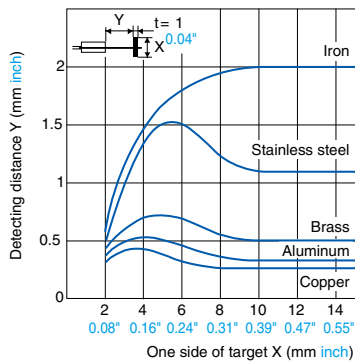
EM-005(P)



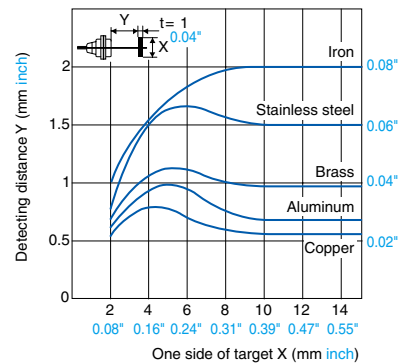
EM-054(P)



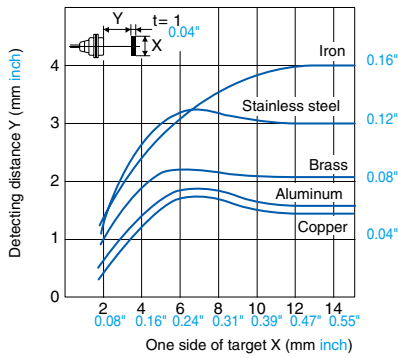
EM-080(P)



EM-010(P)



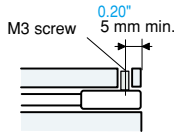
EM-014(P)



Hints on Correct Use

Mounting

- Cylindrical type
Secure the sensor head with a screw at a position 5 mm 0.20" or more from the tip of the head.
[Tightening torque: 0.4 N·m]



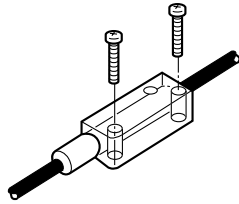
- Threaded type
When mounting the threaded-type sensor head, do not tighten beyond the torque specified in the following table.

Model	Tightening torque
EM-005(P)	1.5 N·m max.
EM-010(P)	10 N·m max.
EM-014(P)	20 N·m max.

Amplifier unit

Use the dedicated mounting bracket supplied with the unit.
* Do not use setscrews to mount the amplifier unit.

Amplifier mounting bracket (accessory)



Wiring

Limit the length of extension to within 50 m 164.0'. The sensor cable (coaxial cable) must not be extended or cut.

Surrounding metal

When embedding the sensor in an iron base, follow the guidelines given below in order to minimize interference from the surrounding metal.



Model	L (mm inch min.)	D (mm inch min.)	d (mm inch min.)
EM-030(P)	4 0.16"	6 0.24"	5 0.20"
EM-038(P)	4 0.16"	7.6 0.30"	5 0.20"
EM-005(P)	4 0.16"	10 0.39"	5 0.20"
EM-054(P)	4 0.16"	10.8 0.43"	5 0.20"
EM-080(P)	5 0.20"	16 0.63"	8 0.31"
EM-010(P)	5 0.20"	20 0.79"	8 0.31"
EM-014(P)	5 0.20"	28 1.10"	8 0.31"

Interference

When installing 2 sensors of the same model face-to-face or in parallel, separate by the distance specified in the following table to prevent interference.

Model	Distance	
	Face-to-face (mm inch min.)	Parallel (mm inch min.)
EM-030(P)	12(1) 0.47*(0.04")	11(0) 0.43"
EM-038(P)	15(1) 0.59*(0.04")	12(0) 0.47"
EM-005(P)	12(1.5) 0.47*(0.06")	13(0) 0.51"
EM-054(P)	20(1.5) 0.79*(0.06")	18(0) 0.71"
EM-080(P)	24(2.5) 0.94*(0.10")	23(0) 0.91"
EM-010(P)	20(2.5) 0.79*(0.10")	25(0) 0.98"
EM-014(P)	40(4.5) 1.57*(0.18")	34(0) 1.34"

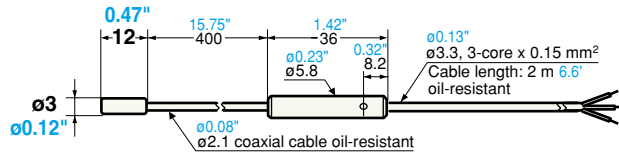
[Note]

The values in parentheses apply to the alternate-frequency type.

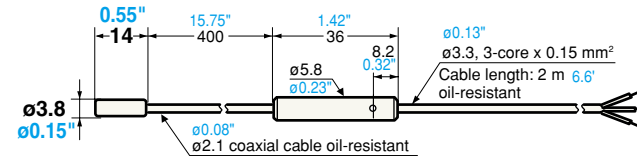
Dimensions

Unit: mm inch

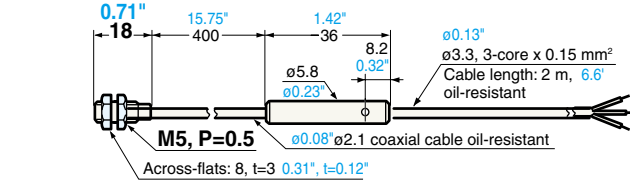
EM-030(P)



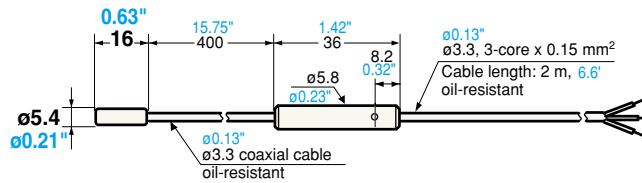
EM-038(P)



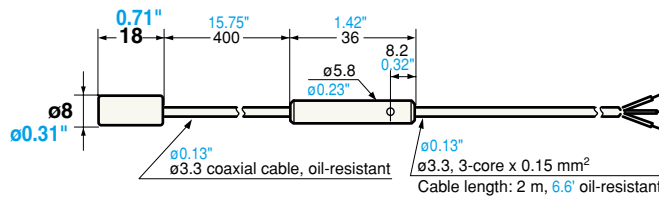
EM-005(P)



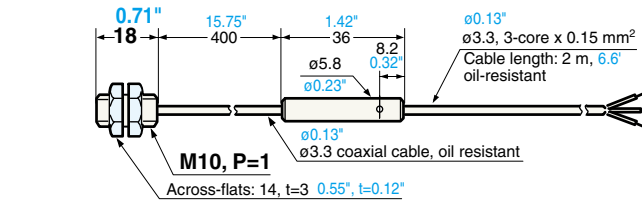
EM-054(P)



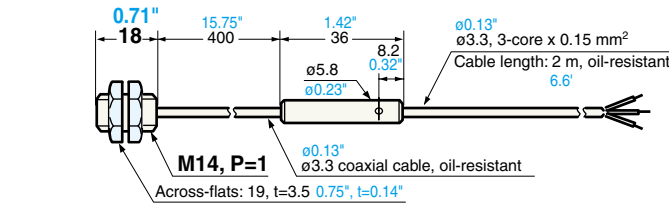
EM-080(P)



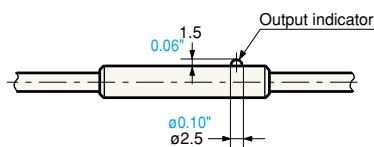
EM-010(P)



EM-014(P)



Detail of output indicator



Amplifier mounting bracket (accessory)

