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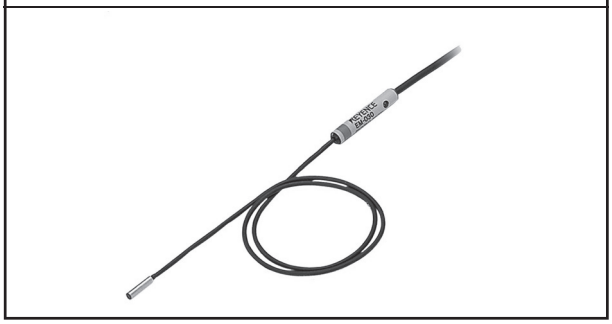
KEYENCE

96M0202

96M0202-3

Proximity sensors with in-cable amplifiers EM series

Instruction Manual



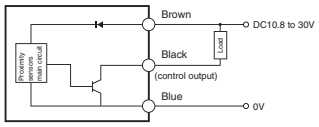
Specifications

Type	Shielded						
Shape	Cylindrical		Thread type	Cylindrical		Thread type	
	ϕ3	ϕ3.8	M5	ϕ5.4	ϕ8	M10	M14
Model	EM-030	EM-038	EM-005	EM-054	EM-080	EM-010	EM-014
Detecting distance	0.6mm±15%	0.8mm±15%	1.0mm±15%	1.2mm±10%	2.0mm±10%	2.0mm±10%	4.0mm±10%
Target	Ferrous metals (See catalog for nonferrous metals)						
Standard target [iron, t=(1㎜)]	5×5mm			6×6mm	10×10mm		15×15mm
Hysteresis	10% max. of detecting distance						
Response frequency	1.2kHz						
Output mode	N.O.						
Temperature drift	±10% of detecting distance at 23˚C (73˚F) [-10 to +70˚C (-13 to +158˚F)]						
Control output	NPN open-collector 200mA max. (40V max.) Residual voltage : 1V max.						
	PNP open-collector 200mA max. (30V max.) Residual voltage : 1V max. ∗1						
Rating: Supply voltage	10.8 to 30VDC, Ripple(P-P) : 10%max. ∗2						
Rating: Current consumption	12mA max. (20mA max ∗3)						
Environmental durability: Degree of protection	IP67 (Use oilresistant cord)						
Environmental durability: Ambient operating temperature	-25 to +80˚C (-1 to +176˚F), No freezing						
Environmental durability: Relative humidity	35 to 95%, No condensation						
Head case material	Stainless steel					Chromium plates brass	
Weight(nuts and 2 meter-long cable included)	Approx. 36g	Approx. 38g	Approx. 40g		Approx. 42g	Approx. 50g	Approx. 60g

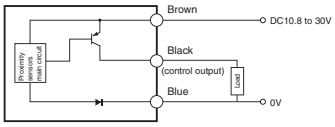
∗1 PNP output types are different models from NPN output types and specified by letter P at the end of the model numbers.(Ex : EM-030P)
∗2 Use a power range between 10.8 and 30V if ripple occurs.
∗3 The figures in ( ) are for PNP output type.

Output circuit

NPN type



PNP type

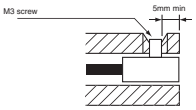


Hints on correct use

Warning Do not use this product for the purpose of protecting the human body.

■Mounting cylindrical type

- Attach the mounting screw to the sensor at minimum of 5mm away from the tip of the sensor.
  Be sure to keep the tightening torque less than 0.4Nm when mounting.



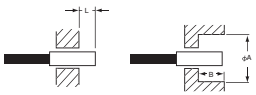
■Mounting thread type

When mounting thread type sensor head, tightening torque should be less than specified below.

Model	Torque
EM-005	1.5Nm max.
EM-010	10Nm max.
EM-014	20Nm max.

Influence of surrounding metallic objects

- To flush mount the sensor that is embedded in iron, provide enough distance between the sensor and surrounding iron as shown by the following figure and table, because the detecting distance is reduced by 10%.



Model	EM-030	EM-038	EM-005	EM-054	EM-080	EM-010	EM-014
L(㎜)	4	4	4	4	5	5	5
A(㎜)	6	7.6	10	10.8	16	20	28
B(㎜)	5	5	5	5	8	8	8

Note: Consult Keyence regarding nonferrous materials.

■Mutual interference

When installing a number of proximity sensors of the same model either face-to-face or side-by-side, provide the minimum distance given in the table between each sensor.

Note : The values enclosed in brackets are when a different frequency type is used.

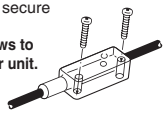
Model \ Distance	Face-to-face installation (㎜)	Side-by-side installation (㎜)
EM-030	12(1)	11(contact installation)
EM-038	15(1)	12(contact installation)
EM-005	12(1.5)	13(contact installation)
EM-054	20(1.5)	18(contact installation)
EM-080	24(2.5)	23(contact installation)
EM-010	20(2.5)	25(contact installation)
EM-014	40(4.5)	34(contact installation)

Two types with different frequencies available. (A) or (B) is written after each type name.

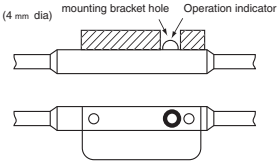
■Installing amplifier unit

A mounting bracket is supplied as a standard accessory. Use it to secure the amplifier unit.

∗Do not use setscrews to secure the amplifier unit.



Align the operation indicator of the amplifier so that it positions at the center of the mounting bracket hole as shown below.



■Wiring

- To extend the cord, use an extension cord with a conductor cross-sectional area of 0.3mm². Limit the length of the extension to within 50m. Note that the coaxial cord must not be extended or cut.
- Ensure that the sensor cord is kept away from power lines and high-tension lines; otherwise, noise may cause the sensor to malfunction.

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