

Proximity sensors with in-cable amplifiers

EM Series

INSTRUCTION MANUAL

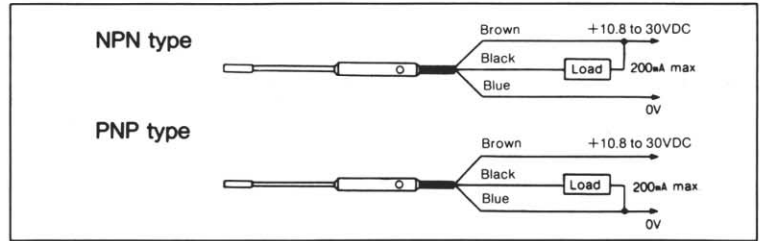
Specifications

Type	Shielded						
	Cylindrical		Thread type	Cylindrical		Thread type	
Shape	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, 1= (1mm))	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					
	Current consumption	12mA max. (20mA max. *3)					
Environmental durability	Degree of protection	IP67 (Use oilresistant cord)					
	Ambient operating temperature	-25 to +80°C (-13 to +176°F), No freezing					
	Relative humidity	35 to 95%, No condensation					
Head case material	Stainless steel			Chromium plated brass			
Weight (Nuts and 2 meter-long cable included)	Approx 36 g	Approx 38 g	Approx 40 g	Approx 42 g	Approx 50 g	Approx 60 g	

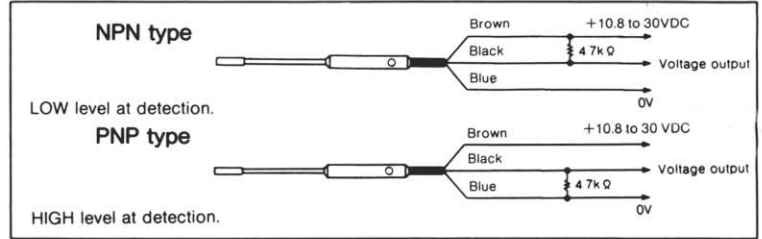
- *1 PNP output types are different models from NPN output types and specified by letter P at the end of the model numbers. (Ex : EM-030P)
- *2 Use a power range between 10.8 and 30V if ripple occurs.
- *3 The figures in () are for PNP output type.

Connection diagram

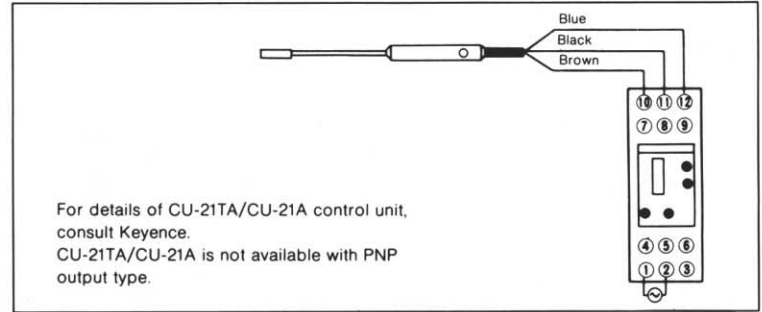
To drive current load :



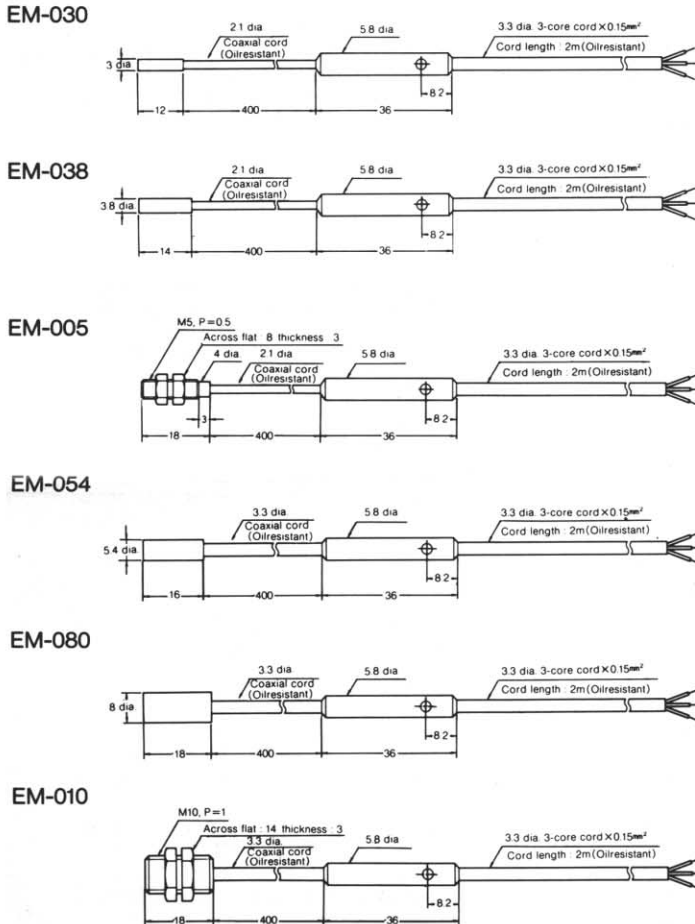
To connect to voltage input device :



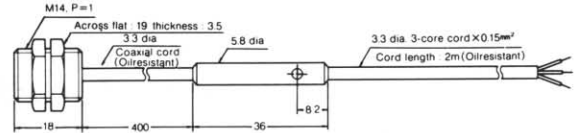
When using CU-21TA/CU-21A control unit :



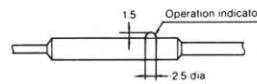
Dimensions (Unit : mm)



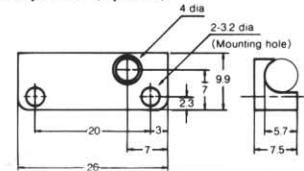
EM-014



Operation indicator dimensions

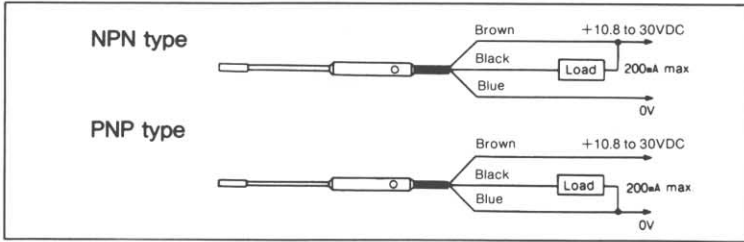


Mounting bracket for amplifier (option)

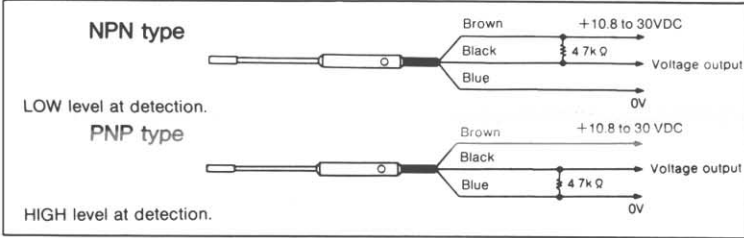


Connection diagram

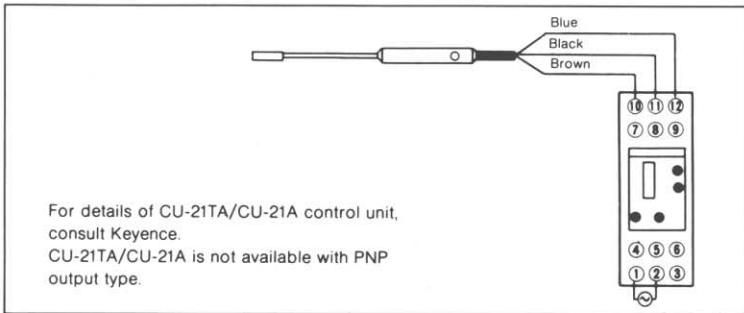
To drive current load :



To connect to voltage input device :

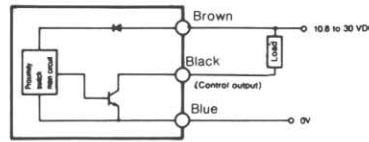


When using CU-21TA/CU-21A control unit :

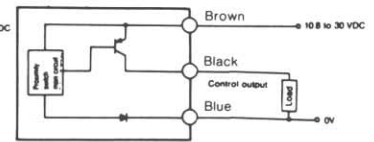


Output circuit

NPN type



PNP type

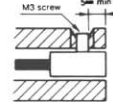


Hints on correct use

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.



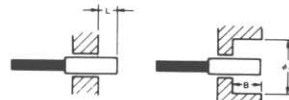
Mounting thread type

- 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 (mm)	4	4	4	4	5	5	5
A (mm)	6	7.6	10	10.8	16	20	28
B (mm)	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.

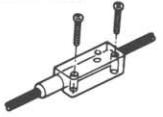
Note : The values enclosed in brackets are when a different frequency type is used.

Model	Distance	Face-to-face installation (mm)	Side-by-side installation (mm)
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)

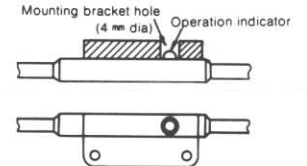
Two types with different frequencies available. (A) or (B) is written after each type name.

Installing amplifier unit

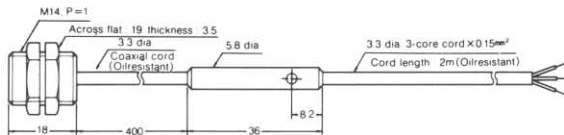
A mounting bracket is supplied as a standard accessory. Use it to secure the amplifier unit.
*Do not use setscrews to secure the amplifier unit.



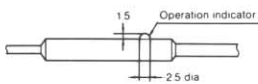
Align the operation indicator of the amplifier so that it positions at the center of the mounting bracket hole as shown below.



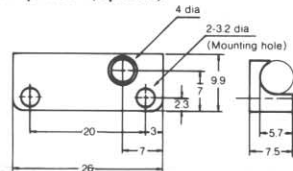
EM-014



Operation indicator dimensions



Mounting bracket for amplifier (option)



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Printed in Japan 0100-17 [96M0202]
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