OMRON

Inductive Proximity Sensor | E2C

Variable Sensing Distance and Differential Travel Allow a Wide Range of Applications

- Various Sensing Heads available in outer diameters from 2.0 to 40 mm.
- Operation and stability indicators (LED) in Amplifier Unit allow easy monitoring of stable operation.
- Amplifier Unit has wide-ranging operating voltages, 10 to 30 VDC or 90 to 264 VAC.
- Small differences in size, distance, and materials can be detected.

Ordering Information

AC 2-wire Models

Size	Shield	Sensing distance	Maximum operating distance	Sensor Head	Amplifier Unit						
					Multi-function				Single-function		Self-diagnostic function
					AC	DC (PNP, NPN)	DC (NPN)	DC (PNP, NPN)	DC (NPN)	DC (PNP)	DC (NPN)
2.0 dia.	Unshielded (see note1)	0.5 mm	1.2 mm	E2C-CR5B	E2C-AK4A	E2C-AM4A	---	---	E2C-GE4B	E2C-GF4B	---
3.5 dia.	Shielded	0.8 mm	1.8 mm	E2C-CR8A			E2C-JCA4	E2C-WH4AF (see note 2) E2C-WH4A	E2C-GE4A	E2C-GF4A	E2C-JCA4P (see note 3)
3.8 dia.		1 mm	2 mm	E2C-CR8B							
M5				E2C-X1A							
5.4 dia.				E2C-C1A							
M8		1.5 mm	3 mm	E2C-X1R5A							
M12		2 mm	5 mm	E2C-X2A				---	---	---	
M18		5 mm	10 mm	E2C-X5A							
M30		10 mm	18 mm	E2C-X10A							
40 dia.	Unshielded	20 mm	50 mm	E2C-C20MA							

Note: 1. The E2C-CR5B cannot be flush-mounted in metal even though the E2C-CR5B is of a shielded construction.
2. Use the E2C-WH4AF in combination with the S3D8 Sensor Controller
3. The E2C-JCA4P is an Amplifier Unit with self-diagnostic output for DIN track mounting.

Specifications

■ Sensor Heads

Model		E2C-CR5B	E2C-CR8A E2C-CR5B	E2C-X1A E2C-C1A	E2C- X1R5A	E2C-X2A	E2C-X5A	E2C-X10A	E2C- C20MA
Sensing object		Magnetic metals (Refer to *Engineering Data* for non-magnetic metals.)							
Standard sensing object		Iron: 5 x 5 x 1 mm	Iron: 5 x 5 x 1 mm	Iron: 5 x 5 x 1 mm	Iron: 8 x 8 x 1 mm	Iron: 12 x 12 x 1 mm	Iron: 18 x 18 x 1 mm	Iron: 30 x 30 x 1 mm	Iron: 50 x 50 x 1 mm
Stable sensing range (within rated temperature range)		0 to 0.5 mm	0 to 0.8 mm	0 to 1 mm	0 to 1.5 mm	0 to 2 mm	0 to 5 mm	0 to 10 mm	0 to 20 mm
Safety sensing range (0°C to 40°C)		0 to 0.7 mm	0 to 1.2 mm	0 to 1.5 mm	0 to 2 mm	0 to 2.5 mm	0 to 7 mm	0 to 15 mm	0 to 28 mm
Maximum operating distance (at 23°C)		1.2 mm	1.8 mm	2 mm	3 mm	5 mm	10 mm	18 mm	50 mm
Response frequency (see note 1)		1 kHz			800 Hz		350 Hz	100 Hz	50 Hz
Ambient temperature		Operating: −10°C to 55°C	Operating: −25°C to 70°C (with no icing)						
Ambient humidity		Operating: 35% to 95%							
Temperature influence		±25% max. of the sensing distance at 23°C in a temperature range of −10°C and 55°C	±15% max. of the sensing distance at 23°C in a temperature range of −25°C and 70°C						
Vibration resistance		Malfunction: 10 to 55 Hz, 1.5-mm double amplitude for 2 hrs each in X, Y, and Z directions							
Shock resistance		Malfunction: 500 m/s^2 (approx. 50G) for 3 times each in X, Y, and Z directions							
Enclosure rating		IEC IP64	IEC IP67						
Cable length (see note 2)		3-m shielded cable	3-m high-frequency coaxial cable (5 m max.)			3-m high-frequency coaxial cable (10 m max.)			
Weight (with 3-m cable)		Approx. 10 g	Approx. 40 g	Approx. 45 g	Approx. 50 g	Approx. 60 g	Approx. 140 g	Approx. 270 g	Approx. 300 g
Material	**Case**	Stainless steel		Brass					
	Sensing surface	ABS resin							
Cable		Polyethylene							

Note: 1. Response frequencies are minimum values applicable to DC solid-state control output used to measure standard sensing objects, each separated from one another with a distance that is double the side dimension of the sensing object and located at a distance that is half the maximum sensing distance.

2. The cable length varies with the Amplifier Unit and Sensor Head in combination. Refer to the table on the next page. The characteristic impedance of the coaxial cable is 50 Ω.

Cable Lengths vs. Amplifier Unit and Sensor Head Combinations

Amplifier Unit	Sensor Head									
	E2C-CR5B	E2C-CR8A	E2C-CR8B	E2C-X1A	E2C-C1A	E2C-X1R5A	E2C-X2A	E2C-X5A	E2C-X10A	E2C-C20MA
E2C-GE4B	3 m only	---	---	---	---	---	---	---	---	---
E2C-GF4B		---	---	---	---	---	---	---	---	---
E2C-GE4A	---	3 m only					---	---	---	---
E2C-GF4A	---						---	---	---	---
E2C-WH4A	---	3 m or 5 m only Set the pins of the cable length selector properly (see note).					---	---	---	---
E2C-WH4AF	---						---	---	---	---
E2C-JC4AP	---	1 to 3 m: Short-circuit the cable length selector terminals. 3 to 5 m: Open the cable length selector terminals.						---	---	---
E2C-JC4A	---	3 m only						---	---	---
E2C-AM4A	3 m or 5 m only with all pins of the cable length selector set to the left.	0 to 5 m Set the pins of the cable length selector properly (see note).					0 to 10 m Set the pins of the cable length selector properly (see note).			
E2C-AK4A										

Note: Refer to page 12 for cable length selection.

■ Amplifier Units

Model		E2C-AK4A	E2C-AM4A	E2C-JC4A E2C-JC4AP	E2C-GE4 j	E2C-GF4 j	E2C-WH4A	E2C-WH4AF
Power supply voltage (Operating voltage range)		100 to 240 VAC (90 to 264 VAC) 50/60 Hz	12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max. (see note 1)					
Current consumption		55 mA max.	50 mA max.	45 mA max.	25 mA max.		25 mA max.	
Sensing distance adjustable range (see note 2)		20% to 100% of rated sensing distance with a 4-turn potentiometer			20% min. of rated sensing distance		20% to 100% of rated sensing distance with a 4-turn potentiometer	
Differential travel		1% to 5% of rated sensing distance (see note 3)		10% max. of sensing distance				
Response time	DC solid-state	Refer to the response frequency of the Proximity Sensor in use.						
	Relay	20 ms max.	---					
Control output	DC solid-state	50 mA max. at 40 V with a residual voltage of 2 V max., transistor photocoupler	200 mA max. at 40 V with a residual voltage of 1.5 V max., NPN and PNP open collector output	100 mA max. at 40 V with a residual voltage of 0.7 V max. (1 V max. for E2C-JC4AP), NPN open collector output	100 mA max. at 40 V with a residual voltage of 1.5 V max., NPN output with a resistance of 4.7 kΩ	100 mA max. at 40 V with a residual voltage of 1.5 V max., PNP output with a resistance of 4.7 kΩ	200 mA max. at 40 V with a residual voltage of 1.5 V max., NPN and PNP open collector outputs	200 mA max. at 40 V with a residual voltage of 1.5 V max., NPN and PNP open collector output Connector output: 50 mA max. with a residual voltage of 2 V max., Transistor photocoupler
	Relay	2 A at 250 VAC, cos ø = 1 (resistive load) (see note 4), SPDT relay output	---					
Output configuration		NO/NC selectable						

Model	E2C-AK4A	E2C-AM4A	E2C-JC4A E2C-JC4AP	E2C-GE4 j	E2C-GF4 j	E2C-WH4A	E2C-WH4AF
Self-diagnostic output	---		E2C-JA4AP only. Output transistor turns ON: Sensor wire burnout or unstable detection 50 mA max. at 40 V with a residual voltage of 1 V max., NPN open collector	---			
Timer function	---		OFF-delay: 40±10 ms	---			
Cable length compensation	Mode selection with a 4-throw switch		E2C-JC4AP only. 3 m/5 m terminals with short bar Short-circuited: 1 to 3 m Open: 3 to 5 m	---		3 m/5 m selectable	
Indicator	Operation indicator and stability indicator		Operation indicator and stability indicator	Operation indicator			
Ambient temperature	Operating: −10°C to 55°C (with no icing)						
Ambient humidity	Operating: 35% to 85% (35% to 95% for the E2C-JC4AP)						
Temperature influence	±10% max. of sensing distance at 23°C in temperature range of −10°C and 55°C						
Voltage influence	DC models: ±1% max. of sensing distance in rated voltage range of ±20% of the rated power supply voltage AC models: ±1% max. of sensing distance in rated voltage range of ±10% of the rated power supply voltage						
Insulation resistance	50 MΩ (at 500 VDC) between current carry parts and case						
Dielectric strength	DC models: 1,000 VAC (50/60 Hz) for 1 min between current carry parts and case AC models: 1,500 VAC (50/60 Hz) for 1 min between current carry parts and case						
Vibration resistance	Malfunction: 10 to 25 Hz, 2-mm double amplitude for 2 hrs each in X, Y, and Z directions		Malfunction: 10 to 55 Hz, 1.5-mm double amplitude for 2 hrs each in X, Y, and Z directions	Malfunction: 10 to 25 Hz, 2-mm double amplitude for 2 hrs each in X, Y, and Z directions		Malfunction: 10 to 25 Hz, 2-mm double amplitude for 2 hrs each in X, Y, and Z directions	
Shock resistance	Malfunction: 100 m/s^2 (approx. 10G) for 3 times each in X, Y, and Z directions						
Life expectancy	Mechanical: 10,000,000 times min. Electrical: 100,000 times min.	---					
Weight	Approx. 250 g	Approx. 140 g	Approx. 50 g (E2C-JC4AP: Approx. 80 g)	Approx. 20 g		Approx. 80 g	

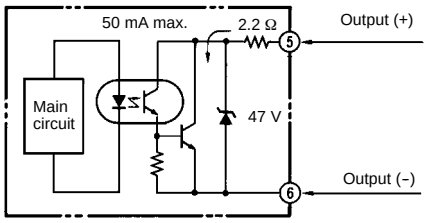
Note: 1. A power supply with full-wave rectification with an average output of 24 VDC±10% can be used with all E2C Amplifier Units except the E2C-GE4 j .

2. The sensing distance adjustable range indicates the sensing range of the E2C Amplifier Unit in satisfactory operation with Sensors.
3. The differential travel is adjustable within a range between 1% and 20% of the rated sensing distance if the E2C-CR5B is used.
4. The built-in Relay is the G2R-114P-V-VS with an operating voltage of 12 V.
5. The weight of each model does not include the weight of the connecting socket.

Operation

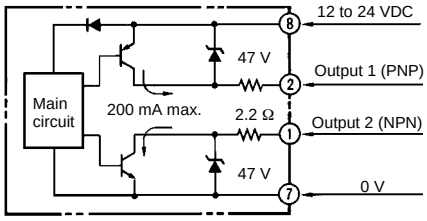
■ Output Circuits

E2C-AK4A (AC-switching Amplifier Unit)

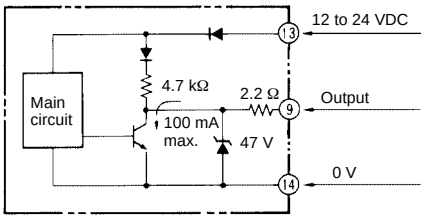


Note: Relay contact output is incorporated.

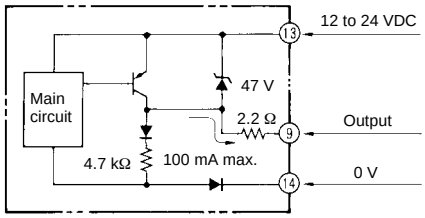
E2C-AM4A (DC-switching Amplifier Unit)



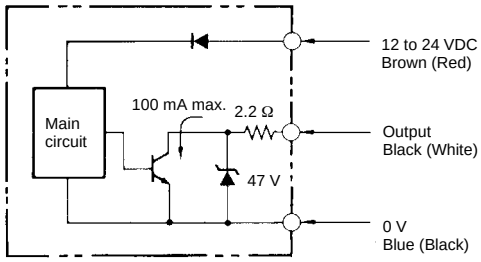
E2C-GE4 j (DC-switching Amplifier Unit)



E2C-GF4 j (DC-switching Amplifier Unit)

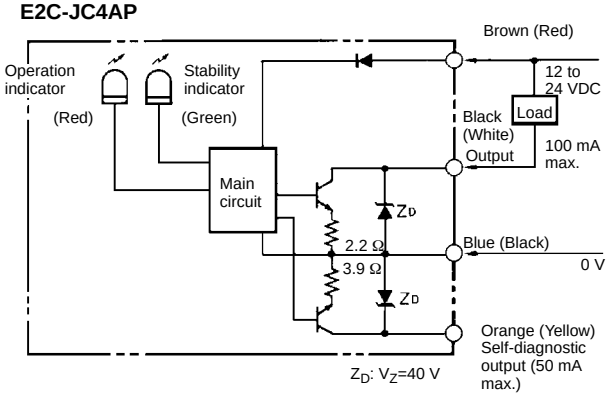


E2C-JC4A (DC-switching Amplifier Unit)

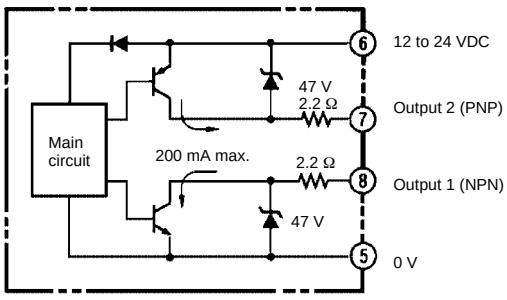


Note: Voltage output from E2C-GE4 j will be available if the operation selector is set to NC. When using voltage output, be sure to reset the E2C-GE4 j after the E2C-GE4 j is turned on, at which moment the E2C-GE4 j generates a pulse for approximately 60 ms. No such pulse is generated from the E2C-GF4 with PNP output.

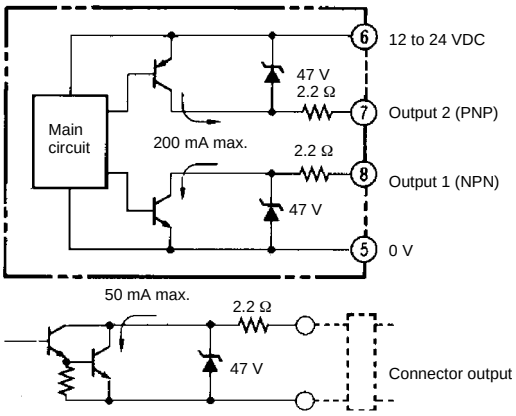
E2C-JC4AP



E2C-WH4A (DC-switching Amplifier Unit)

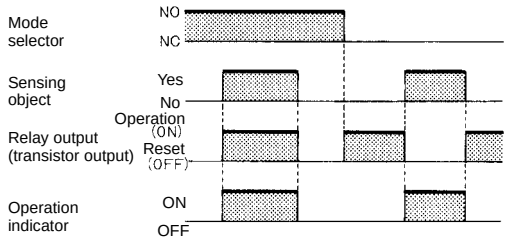


E2C-WH4AF (DC-switching Amplifier Unit with Connector Output)

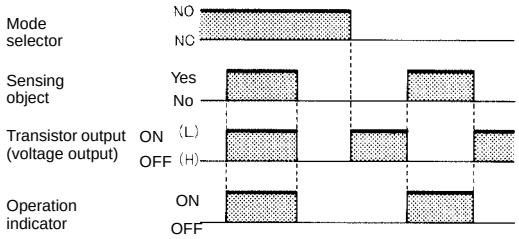


■ Operating Charts

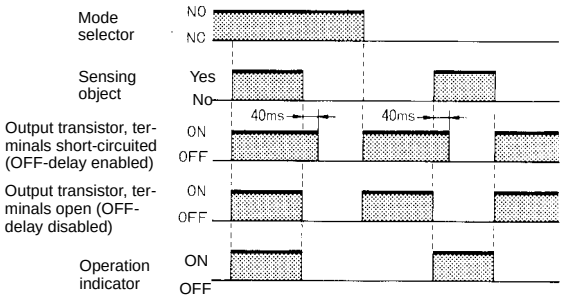
E2C-A j 4A



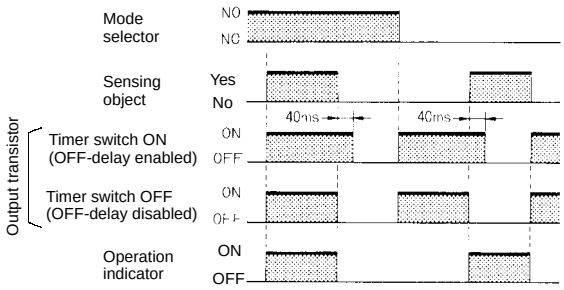
E2C-G j 4 j



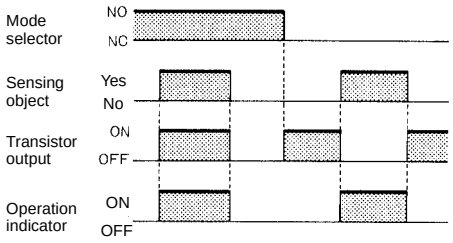
E2C-JC4A



E2C-JC4AP



E2C-WH4A(F)

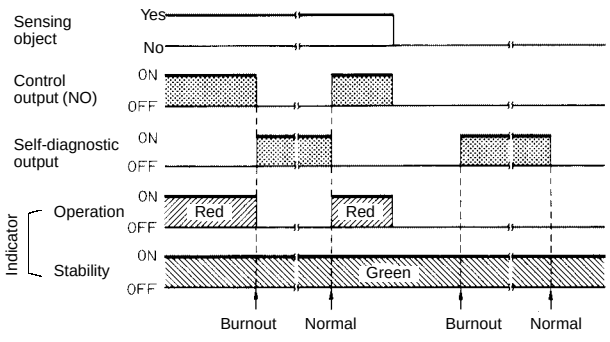


■ Self-diagnostic Function

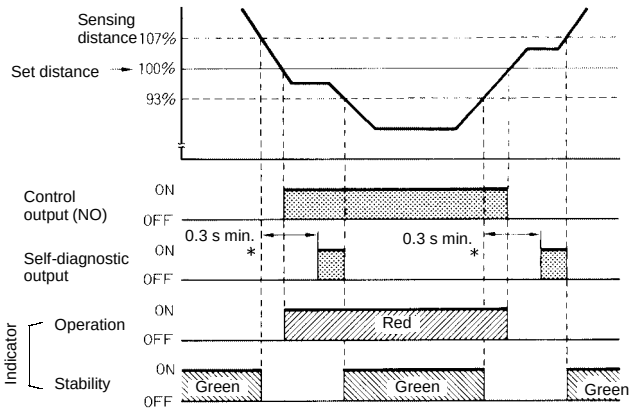
The output transistor of self-diagnostic output will turn on instantly if the E2C detects one of the following events.

1. Sensor wire burnout
2. The operation indicator is ON for 0.3 s or more while the sensing object is at 93% to 100% of the sensing distance. This will occur if the sensing object is in the wrong position, for example.
3. The operation indicator is OFF for 0.3 s or more while the sensing object located at 100% to 107% of the sensing distance. This will occur if the Sensor is influenced by the background of the sensing object, for example.

Sensor Wire is Burnt Out



Sensor Wire is Connected

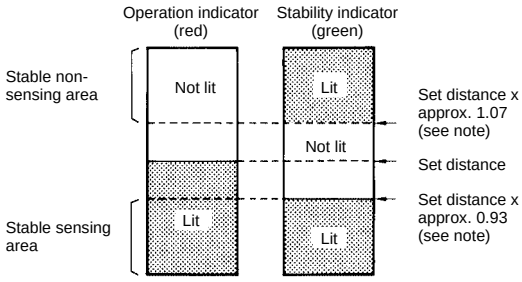


*Self-diagnostic output will be ON if the sensing object moves at slow speed, in which case, add an ON-delay timer circuit.

Note: Replace the 93% value with 96% and the 107% value with 104% for the E2C-X2A.

■ Indicators

- The operation indicator is lit when the sensing object is near the sensing distance.
- The stability indicator is lit when the sensing object position is less than 95% or more than 107% of the sensing distance. The stability indicator indicates the range in which each sensing object is detected smoothly.



Note: Replace the 1.07 value with 1.04 and the 0.93 value with 0.96 for the E2C-X2A.

■ Sensitivity Adjustment

1. Initial Adjustment

After the E2C Amplifier Unit is turned on, adjust the following Sensor according to the status of each indicator without a sensing object.

E2C-G j 4 j Single-function Model
E2C-WH4A(F) Multi-function Model

- Status of Indicators
- Adjustment

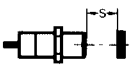
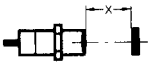
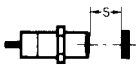
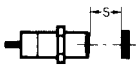
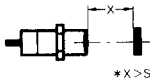
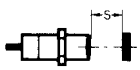
Operation	Sensitivity
Lit	Turn the sensitivity adjuster counterclockwise until the operation indicator turns off.
Not Lit	No adjustment is required.

E2C-JC4A Multi-function Model
E2C-A j 4A Multi-function Model

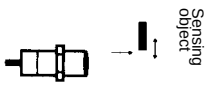
- Status of Indicators
- Adjustment

Indicator mode	Operation	Sensitivity	Sensitivity
A	Lit	Lit	Turn the sensitivity adjuster counterclockwise so that the operation indicator turns off and the stability indicator is lit (i.e., the E2C Amplifier Unit is in mode D).
B	Lit	Not Lit	
C	Not Lit	Not Lit	
D	Not Lit	Lit	No adjustment is required.

2. Sensitivity Adjustment

Item	E2C-G j 4 j Single-function Model			E2C-WH4A(F) Multi-function Model		
Step	1	2	3	1	2	3
Sensing						
Sensitivity adjuster	---		---	---		---
Adjustment	Obtain the sensing distance X from the set distance S divided by 0.8. Determine S so that X will be less than the maximum sensing distance.	Locate the Sensor so that the distance between the Sensor and sensing object is X. Turn the sensitivity adjuster clockwise until the operation indicator is lit.	Return the Sensor to the previous position so that the distance between the Sensor and sensing object is S. Secure the position of the Sensor to complete the sensitivity adjustment.	Obtain the sensing distance X from the set distance S divided by 0.8. Determine S so that X will be less than the maximum sensing distance.	Locate the Sensor so that the distance between the Sensor and sensing object is X. Turn the sensitivity adjuster clockwise until the operation indicator is lit.	Return the Sensor to the previous position so that the distance between the Sensor and sensing object is S. Secure the position of the Sensor to complete the sensitivity adjustment.

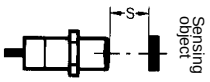
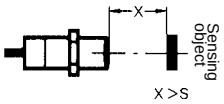
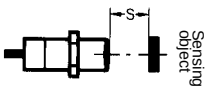
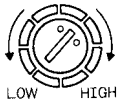
Note: If the E2C Amplifier Unit malfunctions due to radical ambient temperature changes, shorten the distance between the Sensor and sensing object to 80% maximum of the set distance.

Model	E2C-A j 4A and E2C-JC4A Multi-function Models (See note 2)			
Step	1	2	3	4
Sensing	---			
Sensitivity adjuster				---
Adjustment	Set the MD adjuster to the center between “Min” and “Max.”	Locate the sensing object in the adjustment range of sensing distance and turn the sensitivity adjuster clockwise slowly until the operation indicator is lit.	Move the sensing object for a necessary differential travel distance (i.e., 1% to 5% of the rated sensing distance) and turn the MD adjuster counterclockwise slowly until the operation indicator turns off. Then move the sensing object and check that the Sensor detects the object when the object is in the sensing distance range.	Shorten the distance between the Sensor and sensing object and fix the position of the Sensor where both the operation indicator and stability indicator are lit to complete the sensitivity adjustment.

Note: 1. If the E2C Amplifier Unit malfunctions due to radical ambient temperature changes, further shorten the distance between the Sensor and sensing object to 80% maximum of the set distance.

2. The E2C-JC4A has no function to adjust differential travel. Therefore, take steps 2 and 4 only.

■ Adjustment

Model	E2C-JC4AP		
Step	1	2	3
Sensing			
Sensitivity adjuster	---		---
Adjustment	Obtain the sensing distance X from the set distance S divided by 0.8. Determine S so that X will be less than the maximum sensing distance.	Locate the Sensor so that the distance between the Sensor and sensing object is X. Turn the sensitivity adjuster clockwise or counterclockwise until the red operation indicator is lit.	Return the Sensor to the previous position so that the distance between the Sensor and sensing object is S. Secure the position of the Sensor to complete the sensitivity adjustment. The green stability indicator must be lit when the sensing object is located within the sensing distance and not lit when the sensing object is completely outside the sensing distance.

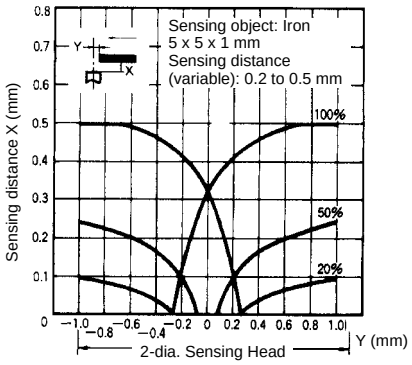
Note: If the E2C Amplifier Unit malfunctions due to radical ambient temperature changes, further shorten the distance between the Sensor and sensing object to 80% maximum of the set distance.

A caution label is provided with the E2C Amplifier Unit. After completing sensitivity adjustment, affix the caution label over the adjuster hole of the cover to prevent mis-operation of the E2C Amplifier Unit.

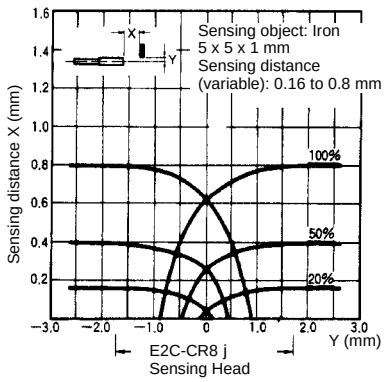
Engineering Data

Operating Range (Typical)

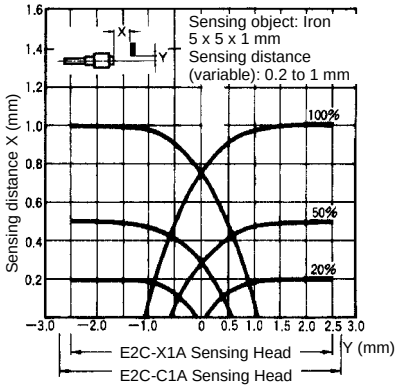
E2C-CR5B



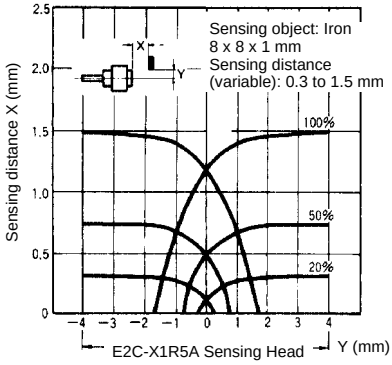
E2C-CR8 j



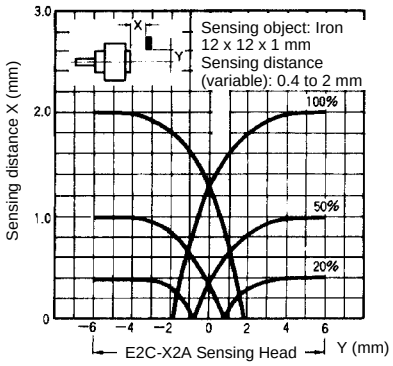
E2C-X1A/E2C-C1A



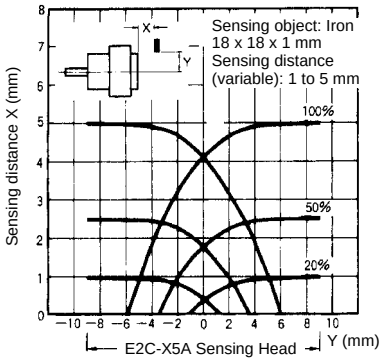
E2EC-X1R5A



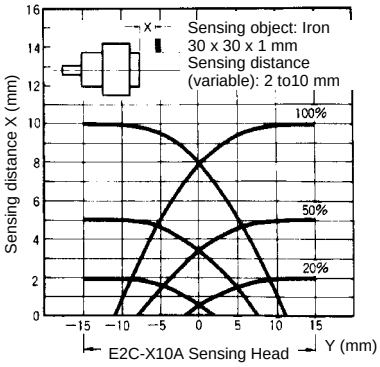
E2EC-X2A



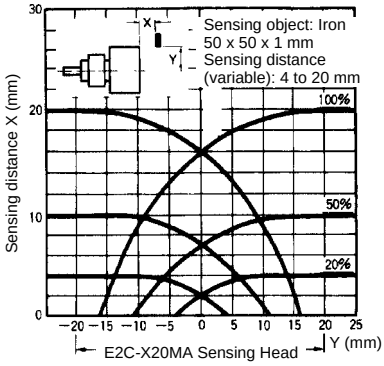
E2EC-X5A



E2EC-CX10A

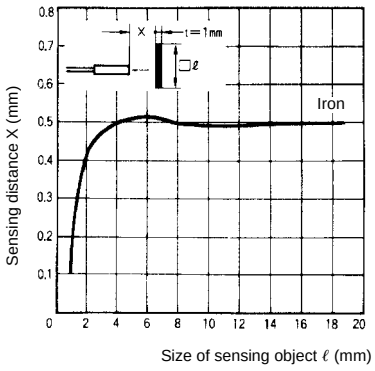


E2EC-C20MA

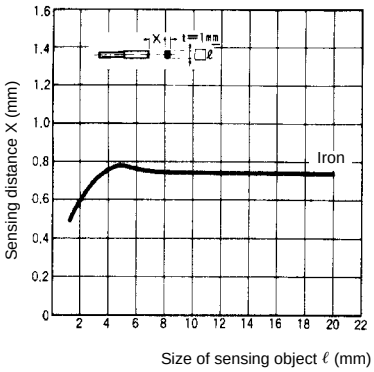


Sensing Distance vs. Sensing Object (Typical)

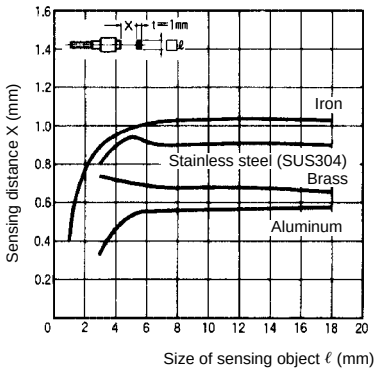
E2EC-CR5B



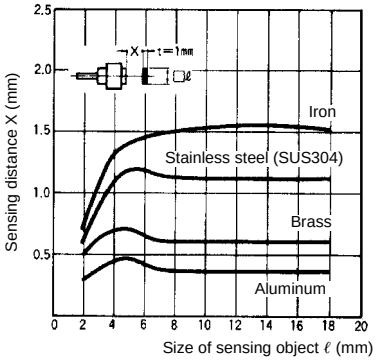
E2C-CR8 j



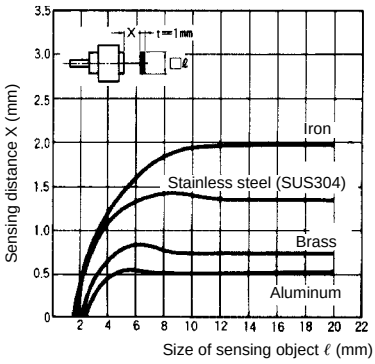
E2C-X1A/E2C-C1A



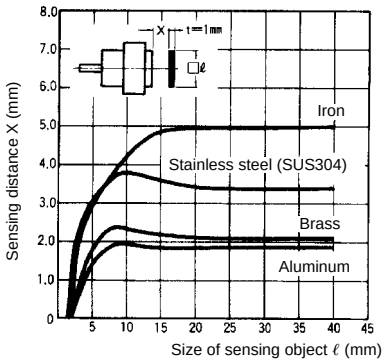
E2EC-X1R5A



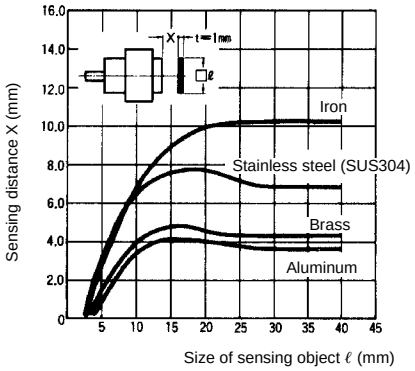
E2EC-X2A



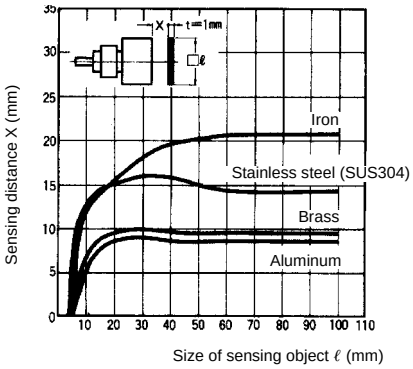
E2EC-X5A



E2EC-CX10A



E2EC-C20MA



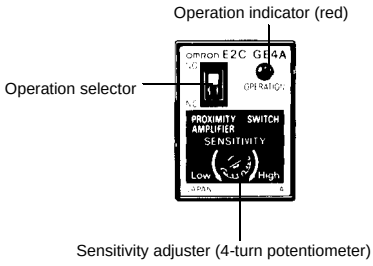
Nomenclature

E2C-G j 4 j Single-function Model

Settings

The output transistor is ON when the sensing object is detected.

The output transistor is ON when the sensing object is not detected.



E2C-JC4A Multi-function Model

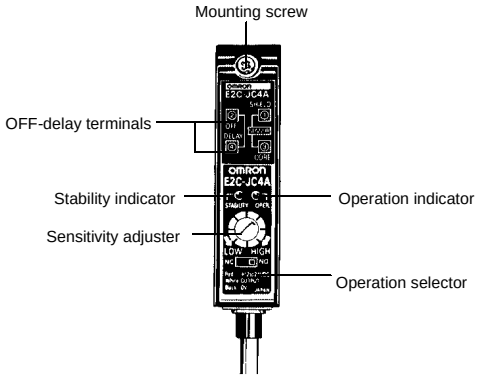
Settings

The output transistor is ON when the sensing object is detected.

The output transistor is ON when the sensing object is not detected.

OFF-delay Timer

The 40-ms OFF-delay timer will be enabled if the OFF-delay terminals are short-circuited.



E2C-JC4AP Self-diagnostic Output Model

Settings

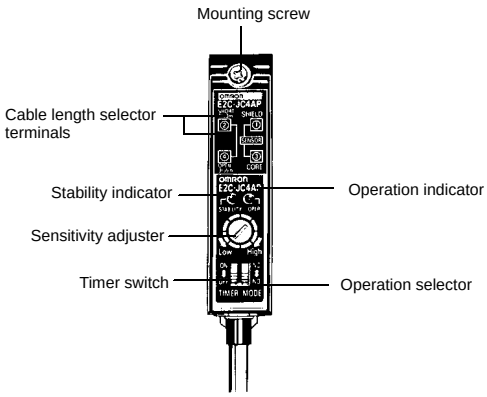
The output transistor is ON when the sensing object is detected.

The output transistor is ON when the sensing object is not detected.

OFF-delay Timer

The OFF-delay timer is disabled.

The 40-ms OFF-delay timer is enabled.



Cable Length Compensation

The type of cable length compensation is selectable with the cable length selector terminals.
1 to 3 m: Short-circuit the cable length selector terminals.
3 to 5 m: Open the cable length selector terminals.

E2C-WH4A(F) Multi-function Model

Settings

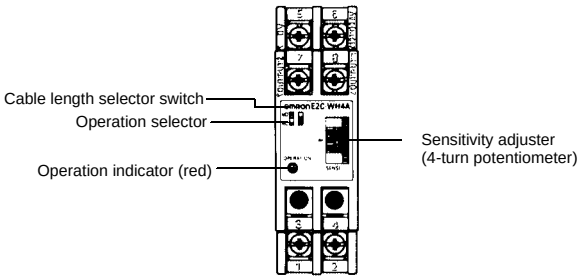
The output transistor is ON when the sensing object is detected.

The output transistor is ON when the sensing object is not detected.

Cable Length Compensation Switch

The cable length of the Proximity Sensor in use is set to 3 m.

The cable length of the Proximity Sensor in use is set to 5 m.

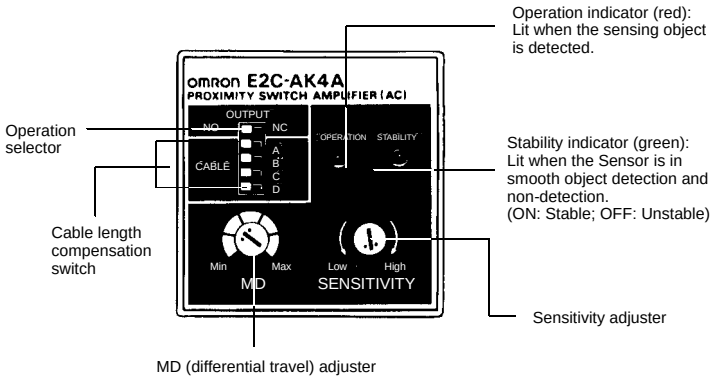


E2C-A j 4A Multi-function Model

Settings

The output transistor is ON when the sensing object is detected.

The output transistor is ON when the sensing object is not detected.



Cable Length Compensation Switch

Refer to the following table to set the cable length compensation switch according to the cable length.

Applicable Sensors \ Cable length		0 to 1 m	1 to 2 m	2 to 3 m	3 to 4 m	4 to 5 m	5 to 6 m	6 to 7 m	7 to 8 m	8 to 9 m	9 to 10 m
E2C-CR8A E2C-CR8B E2C-X1A E2C-C1A E2C-X1R5A	**Switch settings of amplifier unit**						---	---	---	---	---
E2C-X2A E2C-X5A E2C-X10A E2C-X20MA											

Note: 1. If more than two Sensors with the same diameter and length cable are closely mounted side by side, set the switch to a value that is 1 m different from the actual length. Except for the E2C-C20MA, this method can protect the sensors from mutual interference.

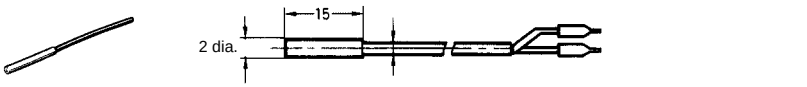
2. Set all the pins of the switch to the left if the E2C-CR5B is used in combination with the E2C-AM4A or E2C-AK4A.

Dimensions

Note: All units are in millimeters unless otherwise indicated.

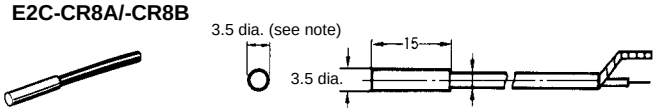
Sensors

E2C-CR5B



1.2-dia. shielded cable with a conductor; standard length: 3 m

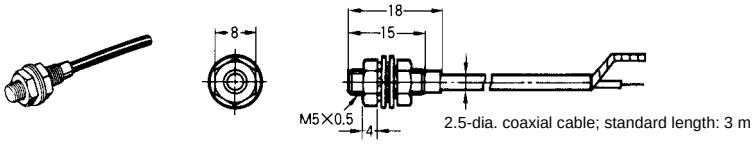
E2C-CR8A/-CR8B



2.5-dia. coaxial cable; standard length: 3 m

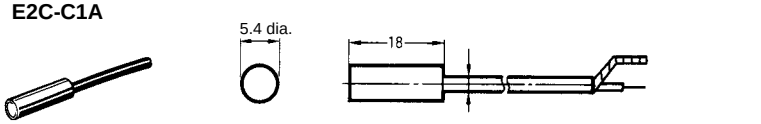
Note: The diameter of the coaxial cable is 3.8 mm for the E2C-CR8B.

E2C-X1A



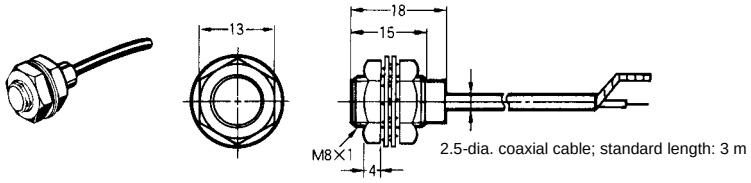
2.5-dia. coaxial cable; standard length: 3 m

E2C-C1A



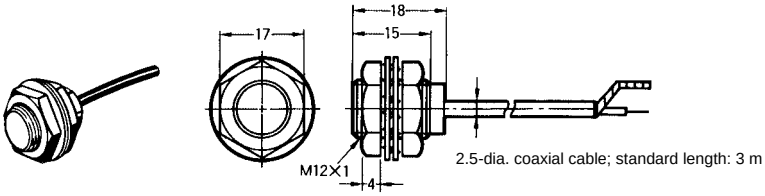
2.5-dia. coaxial cable; standard length: 3 m

E2C-X1R5A



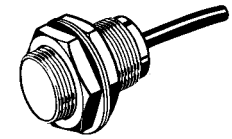
2.5-dia. coaxial cable; standard length: 3 m

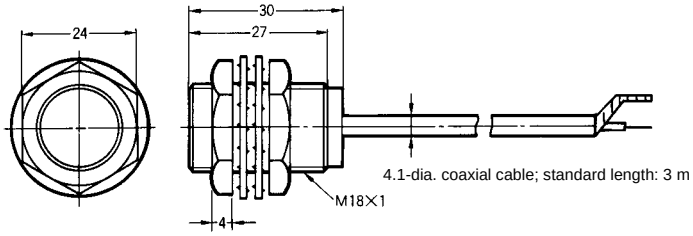
E2C-X2A



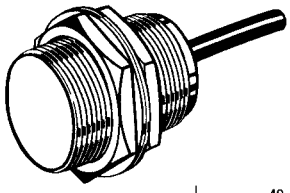
2.5-dia. coaxial cable; standard length: 3 m

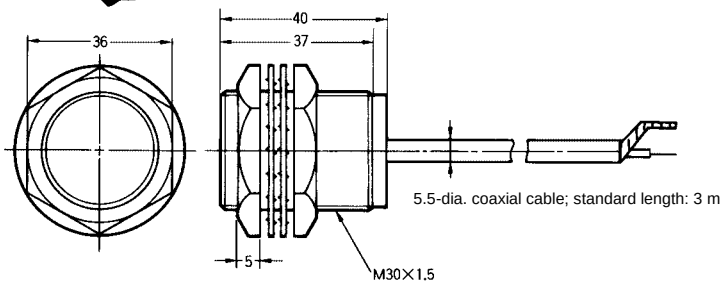
E2C-X5A



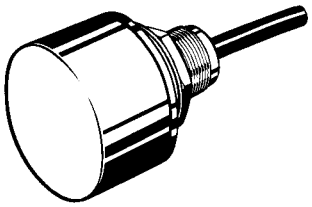


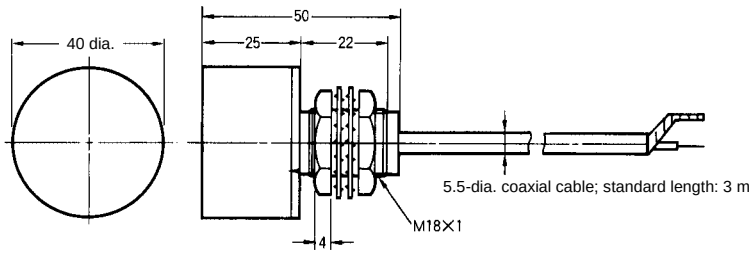
E2C-X10A



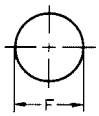


E2C-C20MA





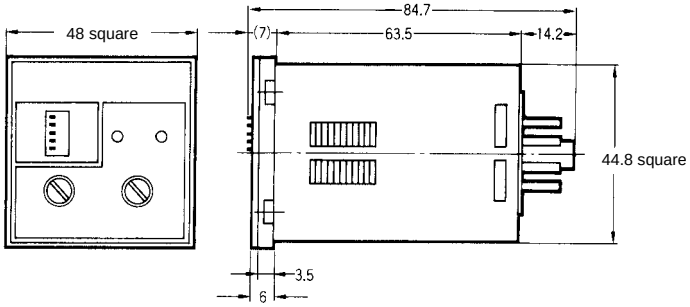
Mounting Hole Dimensions



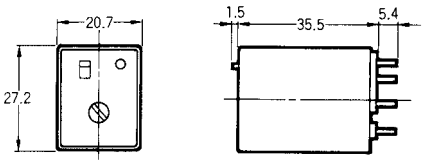
Model	F (mm)
E2C-CR5B	2.2 $^{+0.3}_{-0}$ dia.
E2C-CR8A	3.7 $^{+0.3}_{-0}$ dia.
E2C-CR8B	4.0 $^{+0.3}_{-0}$ dia.
E2C-C1A	5.7 $^{+0.3}_{-0}$ dia.
E2C-X1A	5.5 $^{+0.5}_{-0}$ dia.
E2C-X1R5A	8.5 $^{+0.5}_{-0}$ dia.
E2C-X2A	12.5 $^{+0.5}_{-0}$ dia.
E2C-X5A	18.5 $^{+0.3}_{-0}$ dia.
E2C-X10A	30.5 $^{+0.3}_{-0}$ dia.
E2C-C20MA	18.5 $^{+0.3}_{-0}$ dia.

Amplifier Units

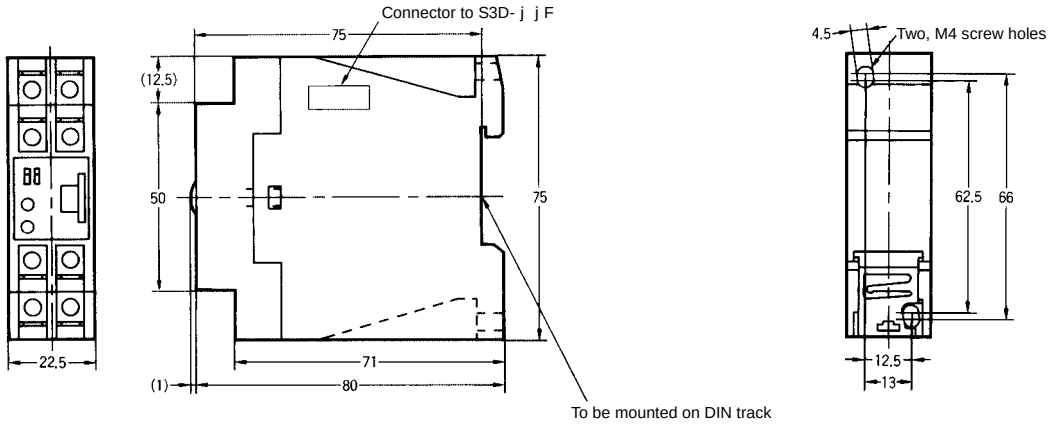
E2C-AM4A



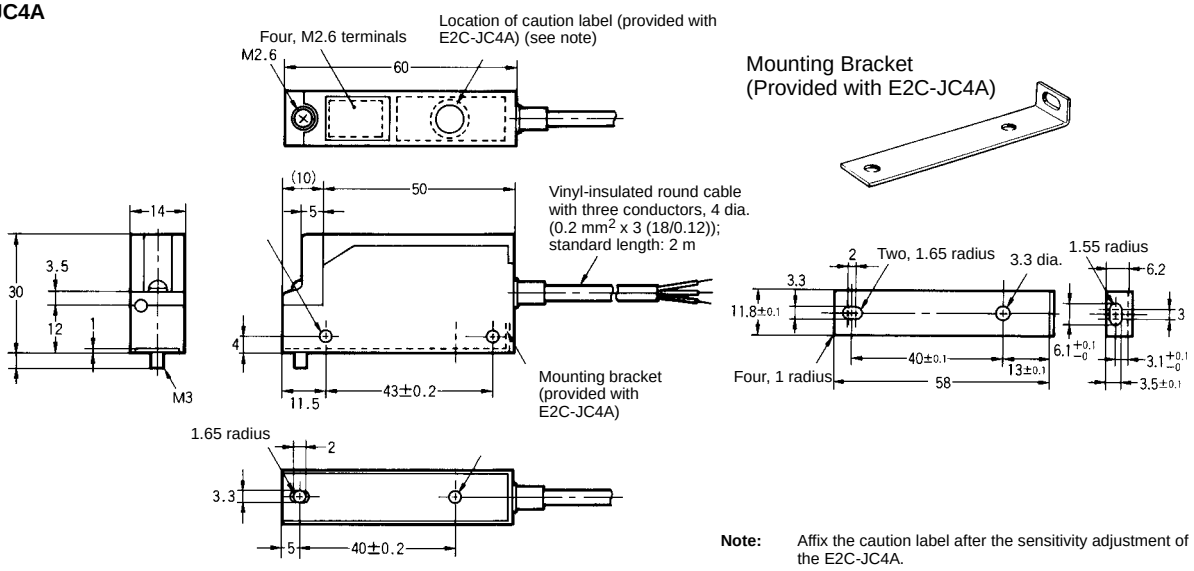
E2C-G j 4 j



E2C-WH4A (F)

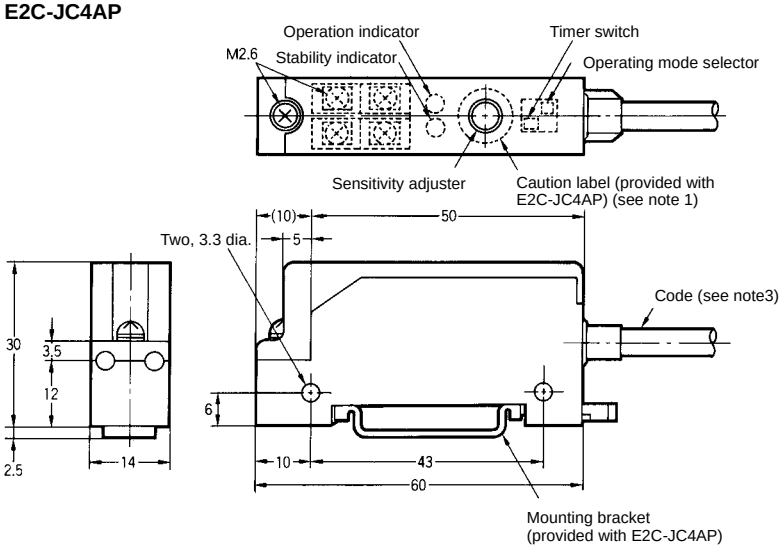


E2C-JC4A

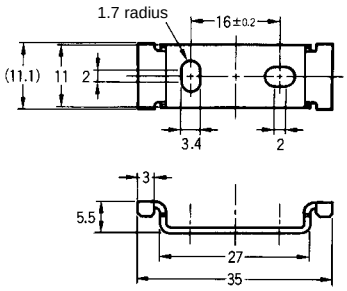


Note: Affix the caution label after the sensitivity adjustment of the E2C-JC4A.

E2C-JC4AP



Mounting Bracket
(provided with E2C-JC4AP)

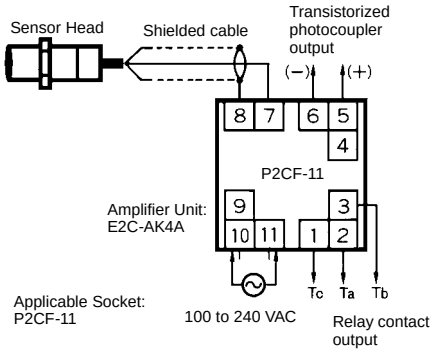


Note:
1. Paste the caution label after the sensitivity adjustment of the E2C-JC4AP to prevent mis-operation.
2. The mounting bracket will not be required if the E2C-JC4AP is mounted to DIN tracks.
3. Vinyl-insulated round cable with four conductors, 4.5 dia. (18/0.12); standard length: 2 m

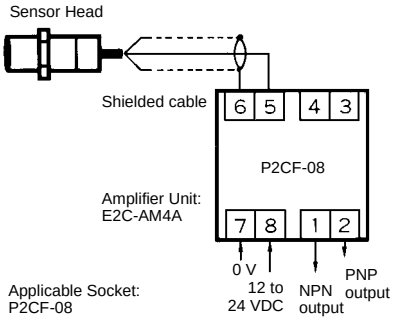
Installation

■ Connection

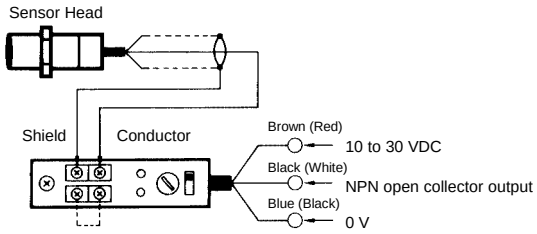
E2C-AK4A



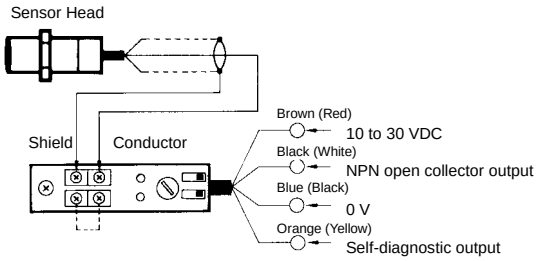
E2C-AM4A



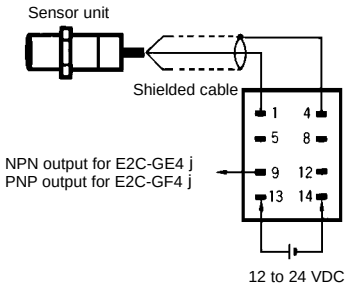
E2C-JC4A



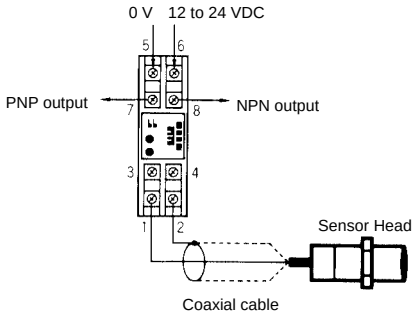
E2C-JC4AP



E2C-G j 4 j

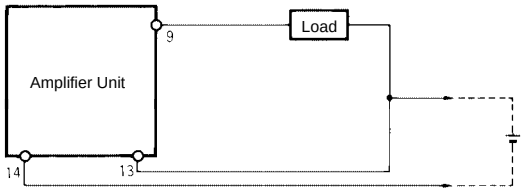
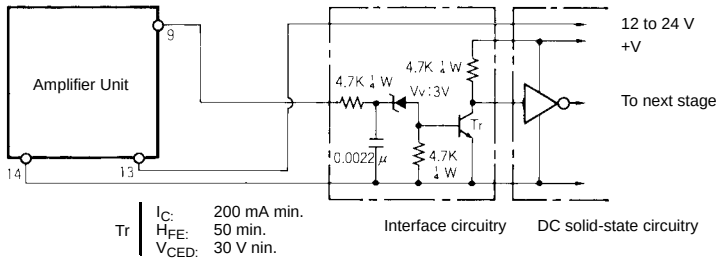


E2C-WH4A (F)

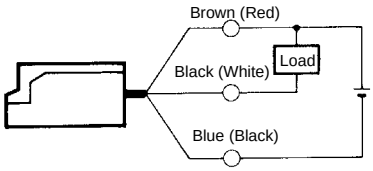
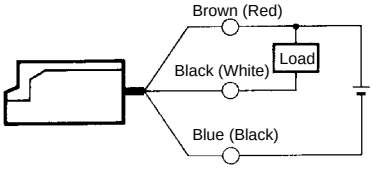
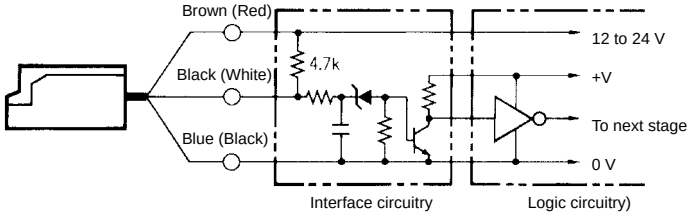


■ Load Connection

E2C-GE4 j

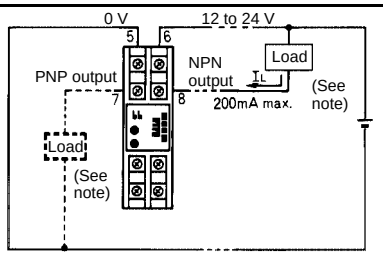
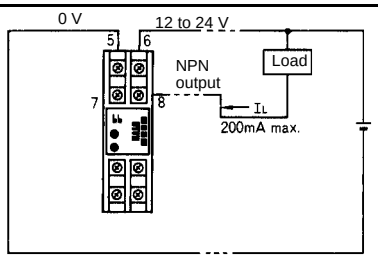
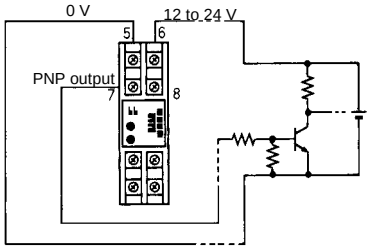
Load/Model	E2C-GE4 j
Direct load driving • Relay • Solenoid	
DC solid-state load • Programmable Controller • Sensor Controller	
Voltage load (logic circuitry)	
Remarks	The C-MOS IC or TTL can be connected to the E2C-GE4 j through the interface and DC solid-state circuitry as shown in the above circuit diagram.

E2C-GC4A

Load/Model	E2C-GC4A
Direct load driving • Relay • Solenoid	
Current-absorbing load • Programmable Controller • Sensor Controller	
Voltage load (logic circuitry)	

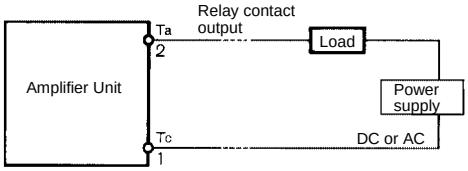
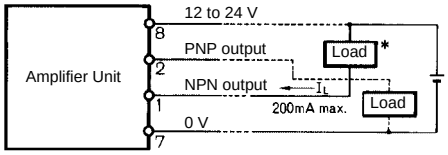
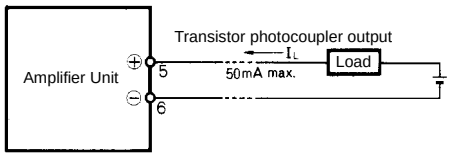
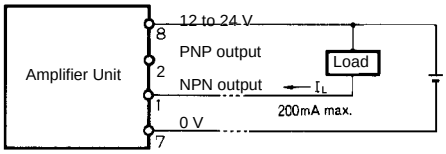
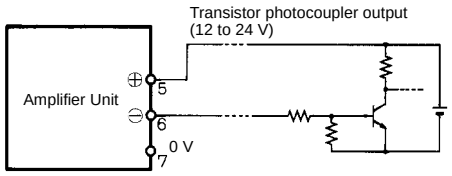
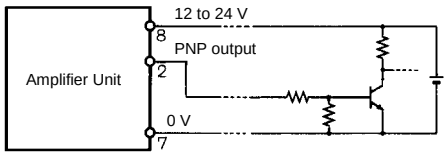
E2C-WH4A(F)

The E2C-WH4A(F) has NPN and PNP open collector outputs. Therefore, there is a degree of freedom in load types and power supply polarity.

Load / Model	Direct load driving Relay Solenoid	DC solid-state load **Current-absorbing load** Programmable Controller S3D8 Sensor Controller	Voltage load (logic load)
E2C-WH4A (F)	 **Note:** Do not impose a voltage exceeding 40 V on the load if the load is connected to an independent power supply.	 **Note:** Connect the load to the PNP output if the load discharges current.	

E2C-AK4A, E2C-AM4A

The E2C-AK4A has relay contact and transistor photocoupler outputs and the E2C-AM4A has NPN and PNP open collector outputs. Therefore, there is a degree of freedom in load types and power supply polarity.

Model / Load		E2C-AK4A	E2C-AM4A
Direct load driving • Relay • Solenoid			 **Note:** Do not impose a voltage exceeding 40 V on the load if the load is connected to an independent power supply.
DC solid-state load	**Current-absorbing load** • Programmable Controller • Sensor Controller (S3D8)	 **Note:** Connect the load to negative transistor photocoupler output if the load discharges current.	 **Note:** Connect the load to PNP output if the load discharges current.
Voltage load (logic load)			

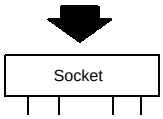
Accessories (Order Separately)

Connecting Socket Models

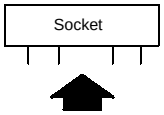
Amplifier Unit	Track-mounting Socket (see note)	Back-connecting Socket	
		Solder terminal	Screw terminal
E2C-AK4A	P2CF1-11	PL11	P3GA-11
E2C-AM4A	P2CF-08	PL08	P3G-08
E2C-G j 4 j	PYF08A	PY08	PYF08M

Note: Track-mounted socket can be used as a front-connecting socket.

Top View

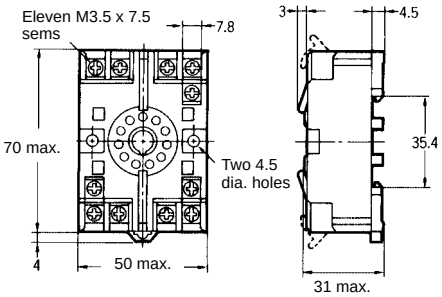


Bottom View

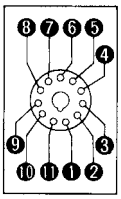


Track-mounted Socket/Front-connecting Socket

P2CF-11

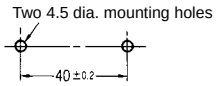


Terminal Arrangement

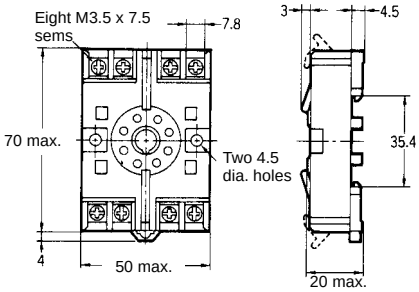


(Top view)

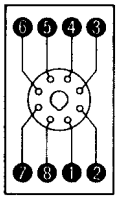
Mounting Holes



P2CF-08

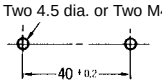


Terminal Arrangement

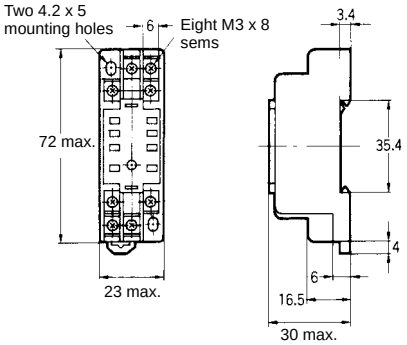


(Top view)

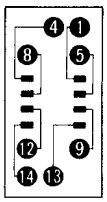
Mounting Holes



PYF08A

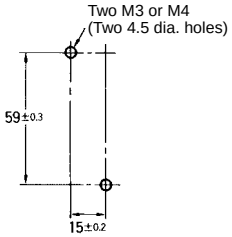


Terminal Arrangement



(Bottom view)

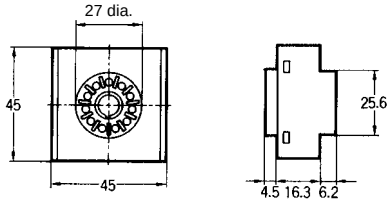
Mounting Holes



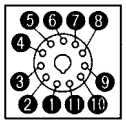
Back-connecting Socket

P3GA-11

Front View

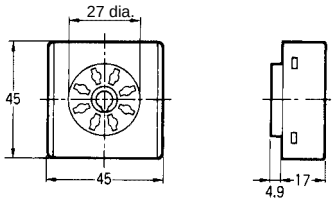


Terminal Arrangement

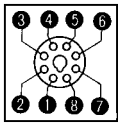


P3G-08

(Front view)

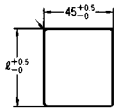


Terminal Arrangement



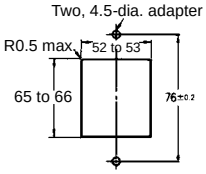
Mounting Dimensions

Embedding Adapter
Y92F-30 (l = 45)
Y92F-71 (l = 55)

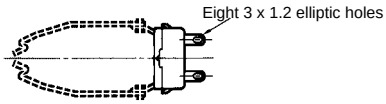


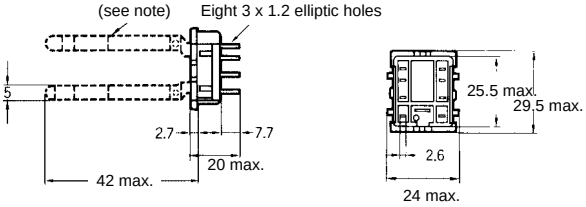
Embedding Adapter
Y92F-70

Two, 4.5-dia. adapter mounting holes



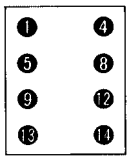
PY08





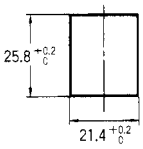
Note: Model PY08-1 includes the dimensions shown in dotted lines.

Terminal Arrangement

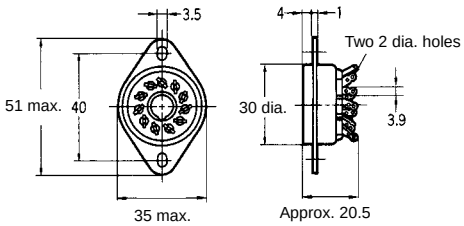


(Bottom view)

Panel Cutout

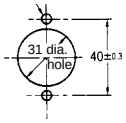


PL11

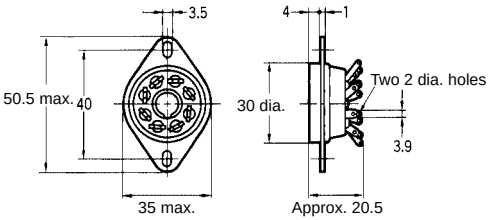


Mounting Holes

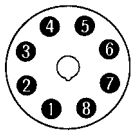
Two 3.5 dia. or two M3 socket-mounting holes



PL08

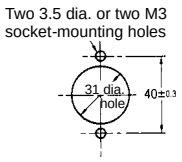


Terminal Arrangement

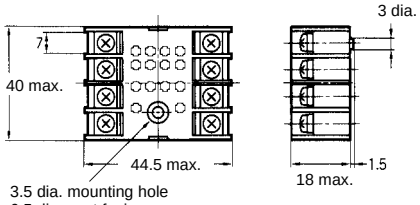


(Bottom view)

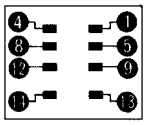
Mounting Holes

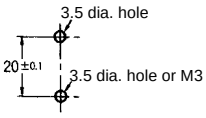


PYF08M



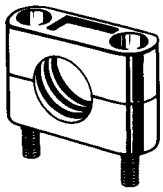
M3.5 sems are used for terminal screws.





Mounting Fixture

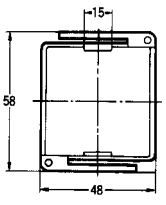
Y92E-B j

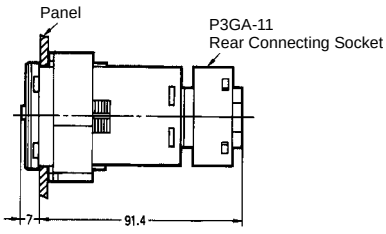


Plastic Mounting Fixtures are available as options.
Select one suited to the dimensions of the Sensor.

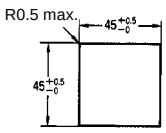
Adapter for Flush Mounting

Y92F-30





Panel Cutout

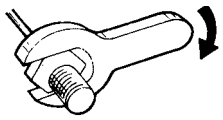


Note: Recommended panel thickness is 1 to 3.2 mm.

Precautions

Mounting

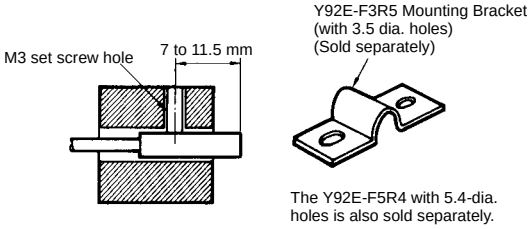
Do not apply excessive torque to the mounting nuts of the E2C-X or E2C-C20MA. Be sure to tighten each nut with a toothed washer.



Model	Tightening torque
E2C-X1A	10 kgf S cm {0.98 N S m}
E2C-X1R5A	20 kgf S cm {2.0 N S m}
E2C-X2A	60 kgf S cm {5.9 N S m}
E2C-X5A	150 kgf S cm {15 N S m}
E2C-X10A	400 kgf S cm {39 N S m}
E2C-X20MA	150 kgf S cm {15 N S m}

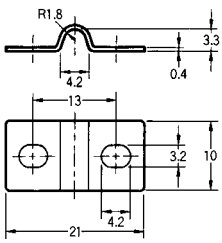
Note: Apply above tightening torque to each nut tightened with a toothed washer.

Tighten the screw to a torque of 2 kgf S cm (0.2N S m) max. to secure the E2C non-screw models.

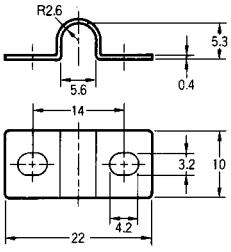


Dimensions

Y92E-F3R5

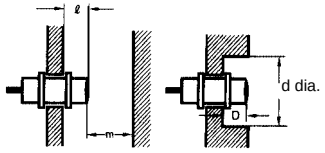


Y92E-F5R4



Effects of Surrounding Metal

When mounting the E2C within a metal panel, ensure that the clearances given in the following table are maintained.



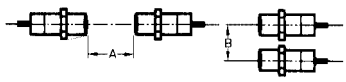
(mm)

Models	ℓ	d	D	m
E2C-CR5B	2	6	2	1.5
E2C-CR8	0	(3.5)	0	2.4
E2C-X1A	0	(5)	0	3
E2C-C1A	0	(5.4)	0	3
E2C-X1R5A	0	(8)	0	4.5
E2C-X2A	0	(12)	0	6
E2C-X5A	0	(18)	0	15
E2C-X10A	0	(30)	0	30
E2C-C20MA	25	120	40	60

Note: Figures in parentheses indicate diameters of shielded models.

Mutual Interference

When mounting more than two E2Cs face to face or side by side, ensure that the minimum distances given in the following table are maintained. Except for the E2C-CR5B, E2C-C20MA, and E2C-G j 4A, mutual interference can be prevented with the setting of the cable length selector of each model. This, however, changes coil characteristics and the ratings may not be ensured at some temperatures or sensing distances. Be sure that the Sensors operate normally after cable length change.



(mm)

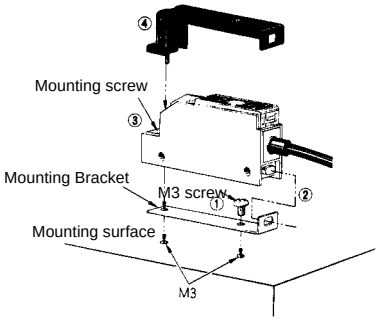
Model	A	B
E2C-CR5B	20	15
E2C-CR8	20	15
E2C-X1A	20	15
E2C-C1A	20	15
E2C-X1R5A	20	15
E2C-X2A	30	20
E2C-X5A	50	35
E2C-X10A	100	70
E2C-C20MA	300	200

Note: The above values are possible with the differential travel of each model set to 5%.

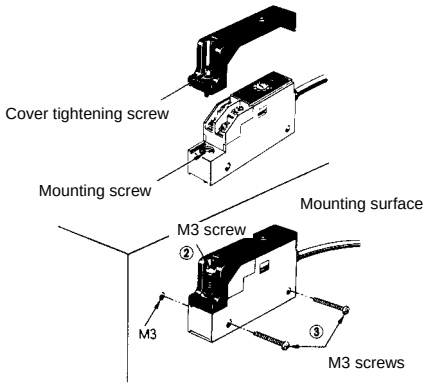
Mounting the Amplifier Unit

E2C-JC4A

- Vertical Mounting
  1. Mount the Mounting Bracket with the M3 screw provided with the E2C-JC4A.
  2. Slide and insert the protruding part of the E2C-JC4A into the hole of the mounting bracket.
  3. Mount the E2C-JC4A with the mounting screw.
  4. Mount the cover on the casing.



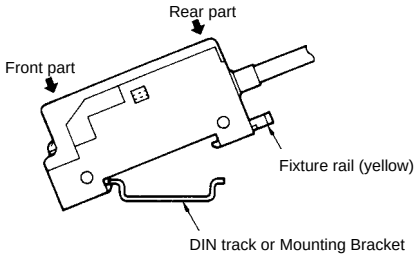
- Side Mounting
  1. Remove the cover tightening screw and mounting screw.
  2. Mount the cover on the casing using the M3 screw provided with the E2C-JC4A.
  3. Mount the E2C-JC4A by inserting and tightening the M3 screws on the side of the E2C-JC4A.



- After adjusting the E2C-JC4A, affix the caution label over the adjuster hole of the cover to prevent the mis-operation.

E2C-JC4AP

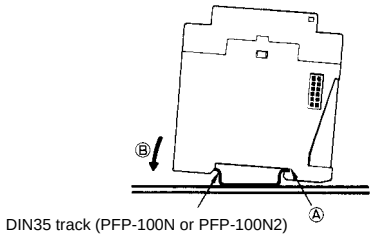
- Mounting
  1. Mount the front part of the E2C-JC4AP to the Mounting Bracket provided or a DIN track.
  2. Press the rear part of the E2C-JC4AP onto the Mounting Bracket or DIN track.



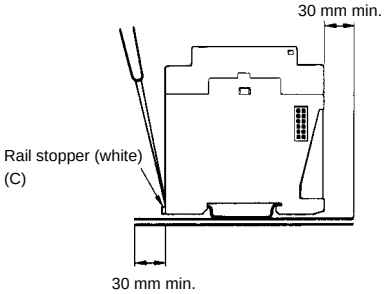
- Dismounting
  3. Pull the fixture rail with a flat-blade screwdriver so that the E2C-JC4AP can be dismounted with ease.

E2C-WH4A(F)

- Mount the E2C-WH4A(F) to a DIN track as shown in the following illustration.
- Hook part (A) of the E2C-WH4A(F) to the DIN track and press E2C-WH4A(F) in the direction indicated by the arrow (B).

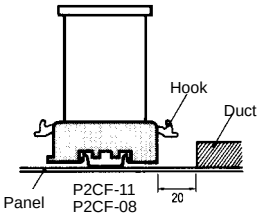


- Dismounting from DIN Track
  Pull the rail stopper indicated by arrow (C) upwards with a flat-blade screwdriver to dismount the E2C-WH4A(F) from the DIN track. If the track is DIN35 track, the E2C-WH4A(F) can be easily dismounted by creating a 30-mm space between the E2C-WH4A(F) and other objects.

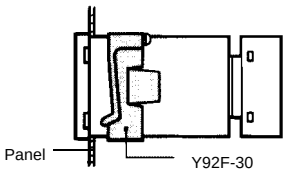


E2C-A j 4A

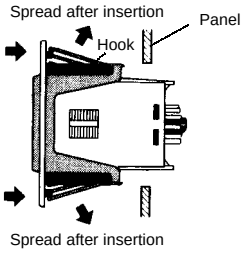
- If more than E2C-A j 4A Amplifier Unit is vertically mounted with the P2CF-11 or P2CF-08 side by side, it will be convenient to leave a 20-mm space on both the upper and lower sides where the hooks are located.



- Panel Mounting
  1. If the Y92F-30 Mounting Adapter is used for the panel mounting of the E2C-A j 4A, insert the E2C-A j 4A into the square hole of the panel first. Next attach the Mounting Adapter from the rear side and press the Mounting Adapter to reduce the space between the Adapter and the panel as much as possible, then secure the Mounting Adapter with screws.

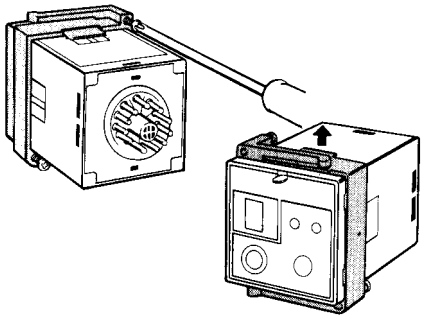


  2. If the Y92F-70 or Y92F-71 Mounting Adapter is used, just insert the E2C-A j 4A into the square panel hole. If the panel coating is too thick and the hooks do not snap on, spread out the hooks appropriately up and down after inserting the E2C-A j 4A into the hole.

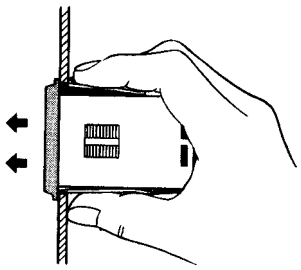


Dismounting the Amplifier Unit

- In the case of the Y92F-30 Mounting Adapter, loosen the screws of the Adapter, spread out the hooks, and remove the Mounting Adapter.



- In the case of the Y92F-70 or Y92F-71 Mounting Adapter, press the hook inwards using the thumb and index finger of both hands, and press the E2C-A j 4A towards the front side.



Wiring the Self-diagnostic Output

- If self-diagnostic output will not be used, connect the yellow lead wire to the 0-V terminal or cut and cover the yellow lead wire with insulation tape so that the yellow lead wire will not be in contact with other terminals.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. D030-E1-5 **In the interest of product improvement, specifications are subject to change without notice.**

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