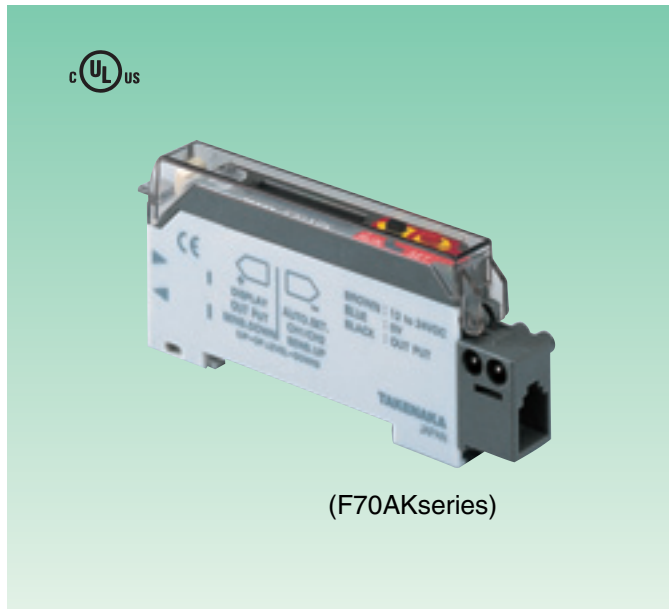


Simplified Wiring Kseries

Simplified-wiring connection type

Fiber optic sensors



(F70AKseries)

- Digital display
- Auto sensitivity setting
- Manual sensitivity setting
- The “new” simplified-wiring connection system employed for each major amplifier model

Up to 16 units of “mixed” model combinations are allowed without a master/slave distinction

48 wires for conventional models are now reduced to 18 wires



Only one output wire required for 15 units
Model F7K-1 uses a dedicated output connector cord

← Model F7K-3 power/output connector cord used for any one of the units in group

Convenient feature

Power supplied to any unit, required output taken out of any unit

Power can be supplied collectively to all units in one group (up to 16 units) at once by simply feeding power supply to any unit through the connector. Stand-alone use is also available. No extra power supply lines required for additional units.

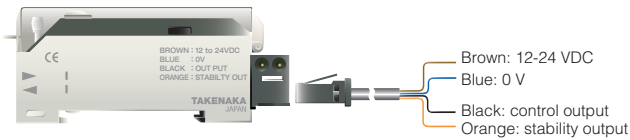
Simplified Wiring K Series

Innovative mini connector employed

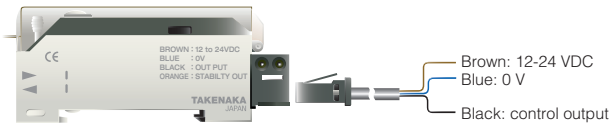
4 types of connector cords available according to input/output function required

Power/output connector cord

- With model F7K-4
(4 leads for power supply, control output, stability output and ground)

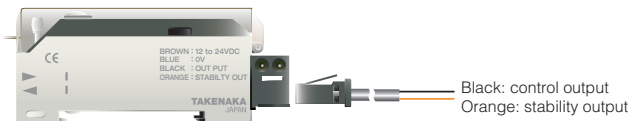


- With model F7K-3
(3 leads for power supply, control output and ground)

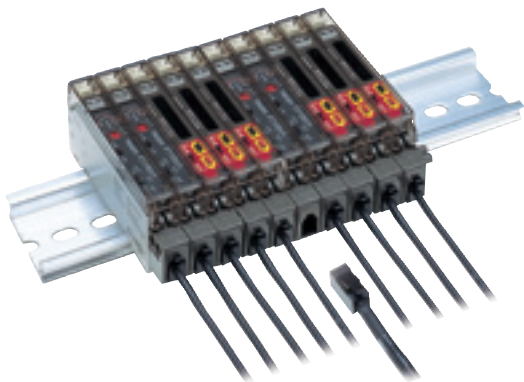
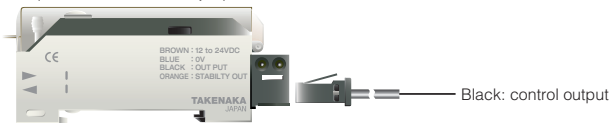


Dedicated output connector cord

- With model F7K-2
(2 leads for control and stability outputs)



- With model F7K-1
(1 lead for control output)



Replacement of connector cords simply by detaching and attaching connectors without moving sensors

Trio capable of serving all types of detection needs

Digital display general-purpose type
F70AK series



Digital display high-performance type
F70K series



Manual sensitivity setting
General-purpose type
High-speed type
F71K series



Simplified Wiring K Series

Type

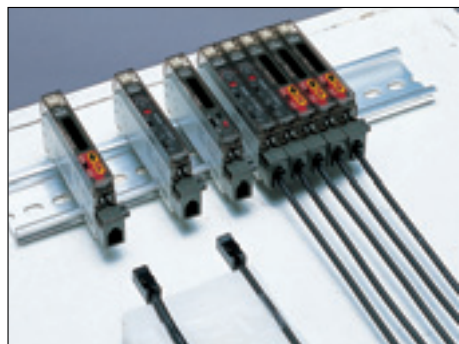
- Amplifier (main unit)

Type	Model		Light source	Output mode	Connection
	NPN output	PNP output			
Digital display general-purpose type	F70ARK	F70ARKPN	Red LED	Open collector (NPN/PNP)	Simplified-wiring connector type {specified connector cord used}
	F70AGK	F70AGKPN	Green LED		
	F70ABK	F70ABKPN	Blue LED		
	F70AWK	F70AWKPN	White LED		
Digital display high-performance type	F70RK	F70RKPN	Red LED		
	F70GK	F70GKPN	Green LED		
	F70BK	F70BKPN	Blue LED		
	F70WK	F70WKPN	White LED		
Manual setting general-purpose type	F71RK	F71RKPN	Red LED		
	F71GK	F71GKPN	Green LED		
	F71BK	F71BKPN	Blue LED		
	F71WK	F71WKPN	White LED		
Manual setting high-speed type	F71RHK	F71RHKPN	Red LED		
	F71GHK	F71GHKPN	Green LED		
	F71BHK	F71BHKPN	Blue LED		
	F71WHK	F71WHKPN	White LED		

- Specified connector cord

Type	Model	Cord length	Description
Power supply / output	F7K-4	2m	4 leads: power supply, 0V, control output, stability output
	F7K-3		3 leads: power supply, 0V, control output
Output only	F7K-2		2 leads: control output, stability output
	F7K-1		1 lead: control output

For the specification of connector cords, see p. 23.



- Fiber optic cable

For different types and prices of fiber optic cables, see pp. 59-.

- Optional parts

Type	Model	Description
End unit	FA7EU	DIN rail mounting stopper

End unit



Simplified Wiring K Series

For Correct Use

Be sure to follow the instructions in the operation manual provided for correct use of the product.

Connection and connector cord

- For simplified wiring, use the specified connector cord separately available.

Type	Power/output connector cord		Dedicated output connector cord	
Model	F7K-4	F7K-3	F7K-2	F7K-1
Maximum number of attachments and detachments of connector	50			
Connector material	Polycarbonate			
Cord	Cord length: 2 m			
	Outer diameter: 4 mm (0.2sq. 4 core)	Outer diameter: 4 mm (0.2sq. 3 core)	Outer diameter: 4 mm (0.2sq. 2 core)	Outer diameter: 2.6 mm (0.2sq. 1 core)
Mass	Approx. 55 g	Approx. 50 g	Approx. 45 g	Approx. 20 g

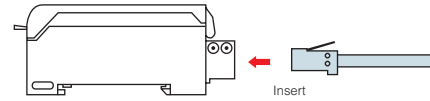
- The connector cord can be attached or detached as amplifiers are joined together without sliding them to either side.
- For the dimensions of connector cords, see p. 34.

Connection diagram

With power/output connector cord model F7K-4	
With power/output connector cord model F7K-3	
Dedicated output connector cord model F7K-2	
Dedicated output connector cord model F7K-1	

Attachment of connector cord

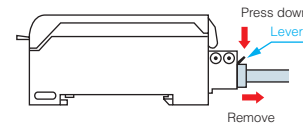
- Join fiber amplifiers.
- Insert the connector cord into each amplifier until it clicks.



- Attach caps on the power supply terminals on the sides of the group of joined amplifiers.

Detachment of connector cord

- Cut the power supply to the fiber sensor.
- Press down the lever of the connector cord to remove the cord.

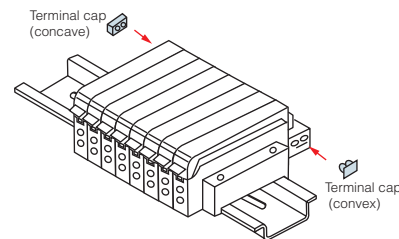


- To extend the cord, use wires of at least 0.3 mm² and limit the length to within 100 m

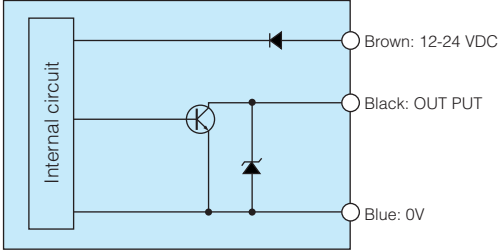
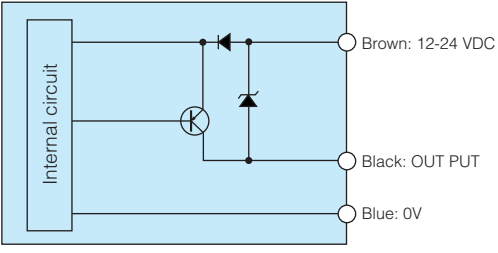
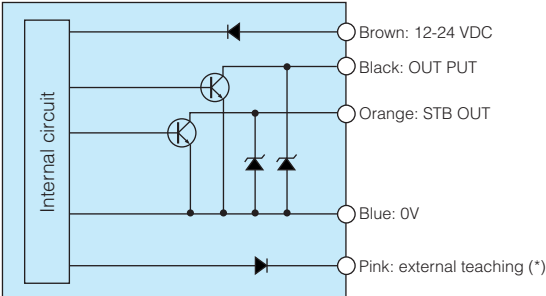
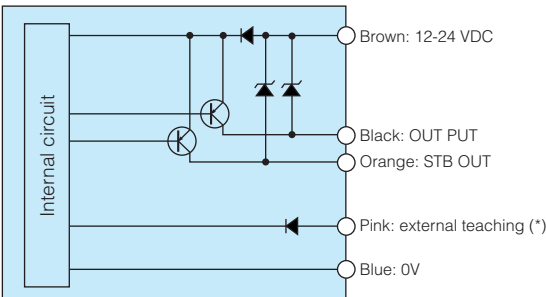
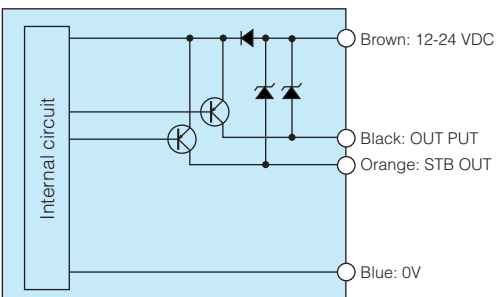
Connector pin short circuit protection

For stand-alone or joined use of amplifiers, be sure to attach the terminal caps that come with amplifiers to the terminals on the ends of a unit or group of units to prevent electrical shock or short circuit with power supply terminals on the back.

Terminal caps are in two types: convex and concave.

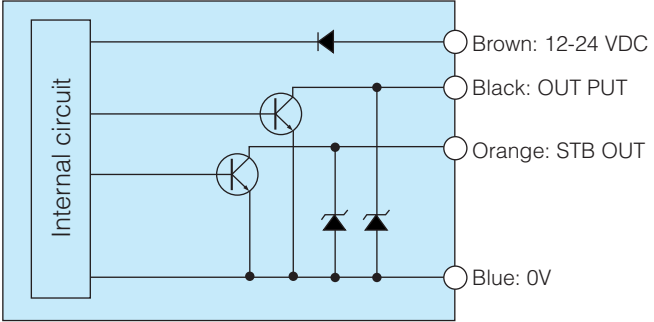
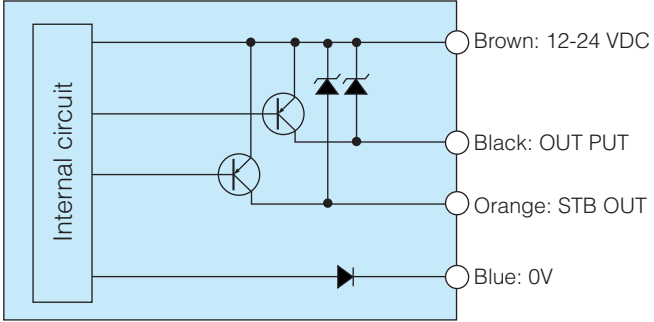


Input/Output Circuit and Connection

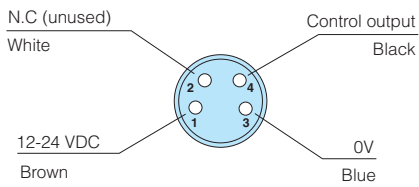
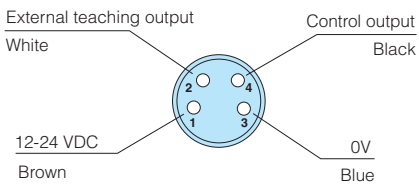
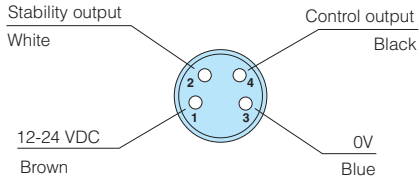
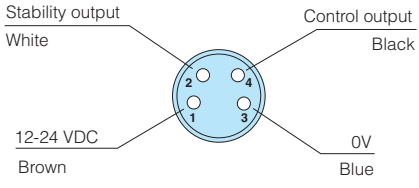
Model	Output circuit diagram
<p>NPN output type</p> <p>F70AR F70ABK F70AG F70AWK F70AB F70AW F70ARK F70AGK</p>	
<p>PNP output type</p> <p>F70ARPN F70ABKPN F70AGPN F70AWKPN F70ABPN F70AWPN F70ARKPN F70AGKPN</p>	
<p>NPN output type</p> <p>F70R F70G F70B F70W</p>	
<p>PNP output type</p> <p>F70RPN F70GPN F70BPN F70WPN</p>	
<p>PNP output type</p> <p>F70RKPN F70GKPN F70BKPN F70WKPN</p>	

(*) When not using external teaching, cut the pink lead at the base or connect it to the positive terminal (for NPN type) or 0V (PNP type) of the power supply.

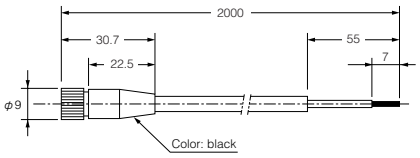
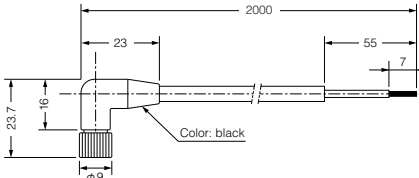
Input/Output Circuit and Connection

Model	Output circuit diagram
<p>NPN output type</p> <p>F70RK F71R F71RK F70GK F71G F71GK F70BK F71B F71BK F70WK F71W F71WK F71RH F71RHK F71GH F71GHK F71BH F71BHK F71WH F71WHK</p>	
<p>PNP output type</p> <p>F71RPN F71RKPN F71GPN F71GKPN F71BPN F71BKPN F71WPN F71WKPN F71RHPN F71RHKPN F71GHPN F71GHKPN F71BHPN F71BHKPN F71WHPN F71WHKPN</p>	

M8 Connector Type IO Specification/Pin Arrangement/Lead Colors

<p>F70A" -J"</p> 	<p>F70" -JE"</p> 
<p>F71" -J"</p> 	<p>F70" -JS"</p> 

- Dimensions of cord with M8 connector (optional) (in mm)

<p>FBC-4R2S (straight)</p> 	<p>FBC-4R2L (angled)</p> 
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Common to F70A/F70/F71 Series

For Correct Use

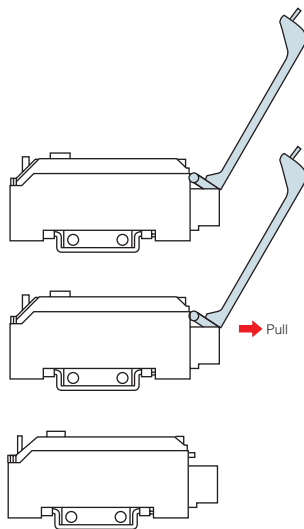
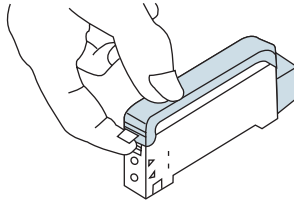
Be sure to follow the instructions in the operation manual provided for correct use of the product.

● Handling of amplifier case cover

① Opening the case cover

While pressing down the front part of the case cover, lift the cover by pulling up the tab.

Just roughly pulling the case cover tab for opening may damage the cover. Be sure to press the front part of the cover when pulling the tab.



The cover opens up to the connector on the back and stays at the half-opened position.

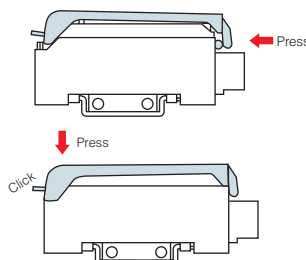
Pulling at the hinge with the cover half open allows removal of the cover.

Cover removed

② Attaching the cover

Put the case cover on the amplifier as shown on the figure on the right and push in at the hinge.

Press down the front part of the cover until it clicks and make sure that the tab is hooked.

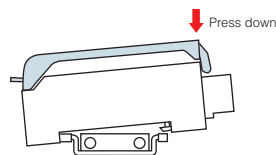


● Attaching amplifier on DIN rail or mounting bracket

The mounting bracket is optional. The amplifier cannot be side-mounted with a mounting bracket used.

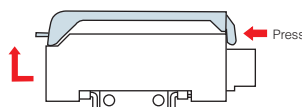
① Attachment

Put the front hook of the amplifier on the rail (or mounting bracket) and press down the back of the amplifier.



② Detachment

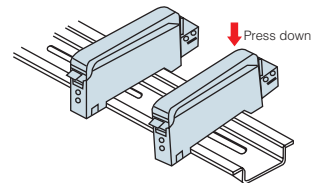
While pressing the amplifier forward, lift the front part and detach the front hook.



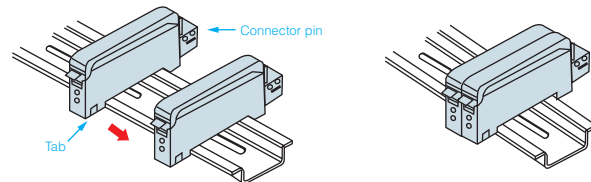
● Attachment of amplifiers for joined use

When using two or more amplifiers by joining them together, be sure to use a DIN rail for mounting. Up to 16 units can be joined for use. Be sure to cut the power supply before attempting to join or separate units.

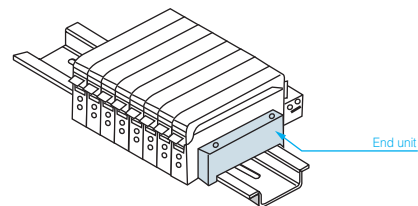
① Mount one amplifier at a time on the DIN rail while keeping a certain space between amplifiers.



② Slide the amplifiers so that the tabs on the front and the connector pins on the back are respectively joined together.



③ To prevent the connections from coming loose due to vibration, etc., attach end units (optional) on the ends of the group of amplifiers to secure them.



④ To detach the amplifiers, follow the steps in reverse order and remove one amplifier at a time.

Removing the amplifiers as they are joined together without sliding may damage the amplifiers.

Common to F70A/F70/F71 Series

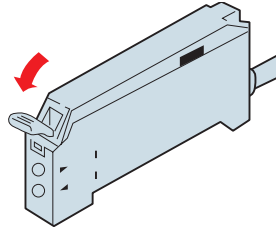
■ For Correct Use

Be sure to follow the instructions in the operation manual provided for correct use of the product.

● Attachment of fiber optic cable

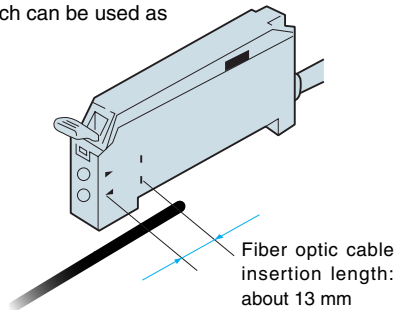
Attachment to amplifier

1. Open the case cover and press down the single-touch lock lever.

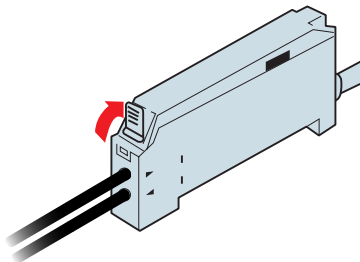


2. Insert the fiber optic cable all the way until it stops.

To prevent inadequate insertion of a fiber optic cable, marks to indicate the insertion length are provided on the case side, which can be used as gauges.

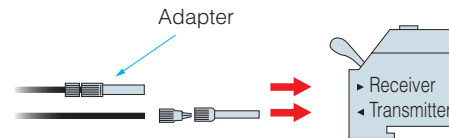


3. Lift the single-touch lock lever.



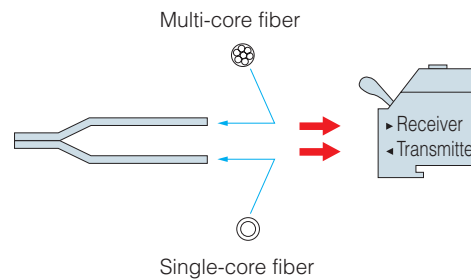
Attachment of small-diameter fiber optic cable

When attaching a small-diameter fiber optic cable, use the adapter that comes with the fiber optic cable.



Attachment of coaxial reflective fiber optic cable

Attach the multi-core fiber to the receiver and single-core fiber to the transmitter.



● Notes on usage

- When using two or more amplifiers joined together, be sure to use a DIN rail for mounting. Different ambient temperatures apply according to the number of joined amplifiers.

No. of amplifiers	Ambient temperature
1-3	-25 - +55 °C
4-10	-25 - +50 °C
11-16	-25 - +45 °C

- Be sure to turn off the power supply before wiring.
- To extend the cord, use wires of at least 0.3 mm² and limit the length to within 100 m.
- Using the same conduit for the amplifier wiring and power transmission or high-voltage lines may cause faulty operation

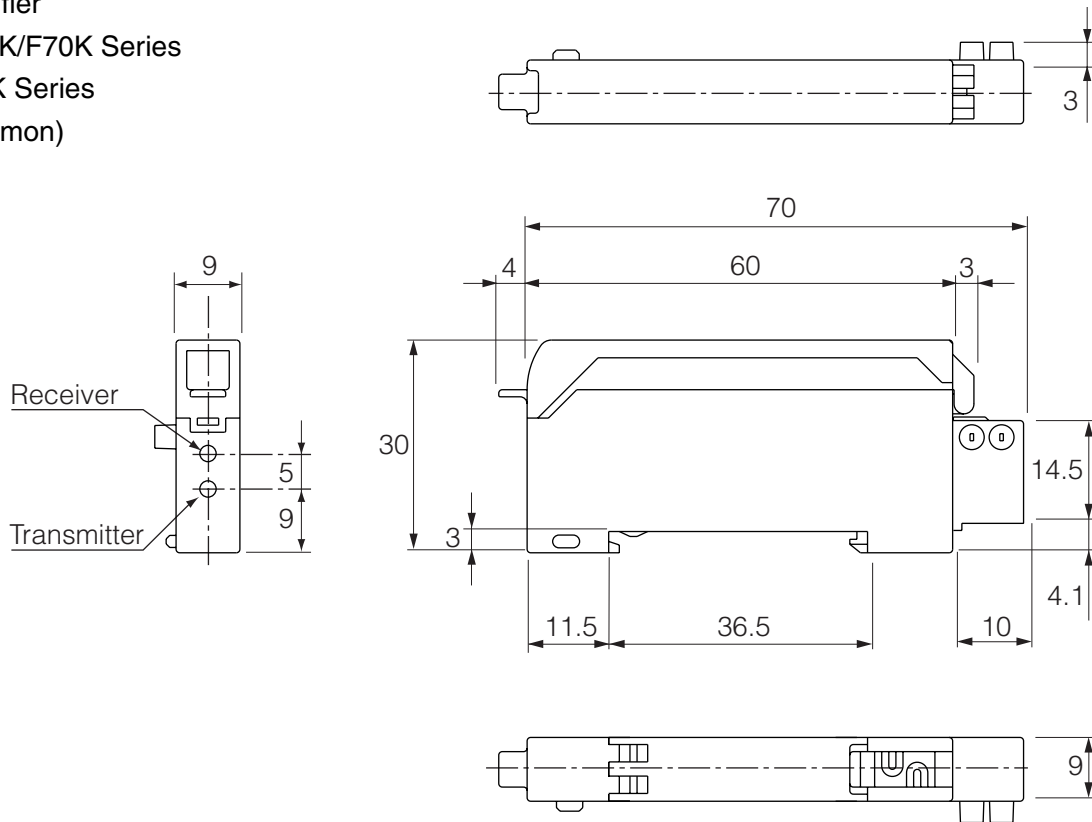
or damage due to noise. Be sure to route them separately.

- Make sure that the power fluctuation is within an allowable range so that the power input will not exceed the rating.
- When using a commercially-available switching regulator, use the frame ground or ground terminal.
- For output, avoid the transient condition (0.5 seconds) immediately after power-up.
- Do not use the sensor in a place subject to steam, large amount of dust or direct exposure to water or oil.
- Do not use the sensor outdoors or in a place subject to direct disturbing light on the light receiving surface.
- Use of a reflective-type fiber optic cable at the maximum sensitivity may cause inadequate light blocking. Be sure to use a work for sensitivity setting.

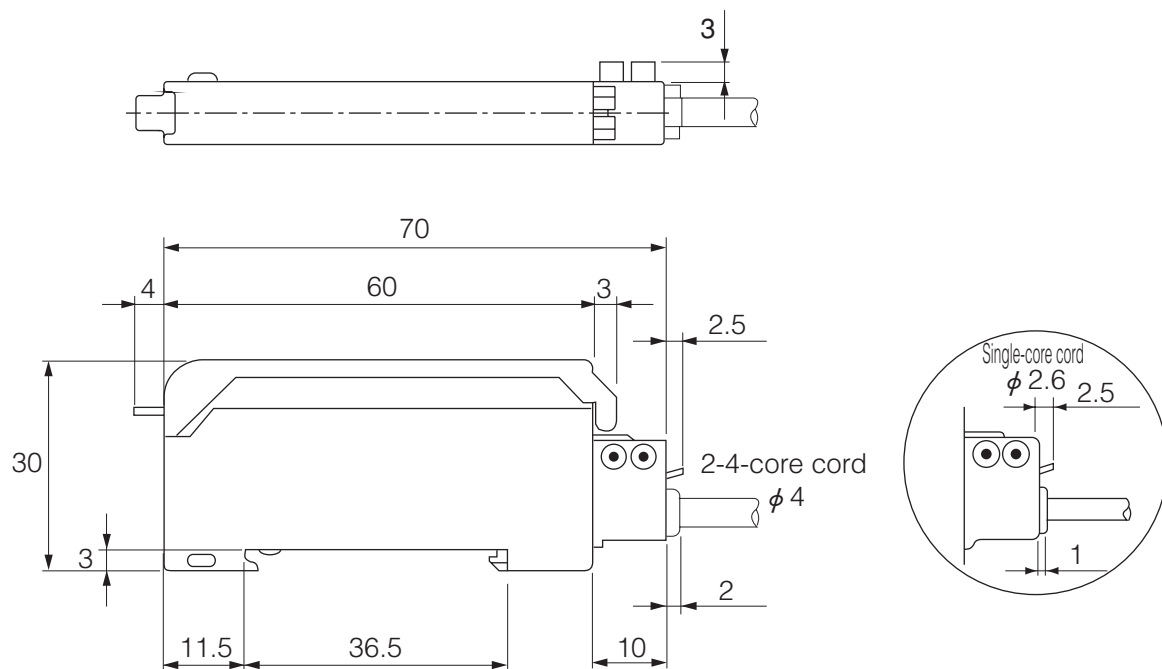
Simplified-Wiring Connective Type

Dimensions (in mm)

Amplifier
F70AK/F70K Series
F 71K Series
(Common)



With specified connector cord attached



For dimensions of fiber optic cables, see pp. 67-.

Simplified-Wiring Connective Type

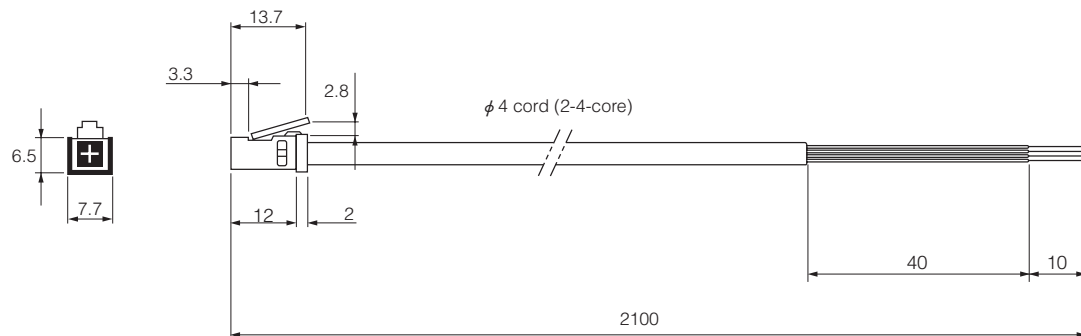
■ Dimensions (in mm)

Specified connector cord

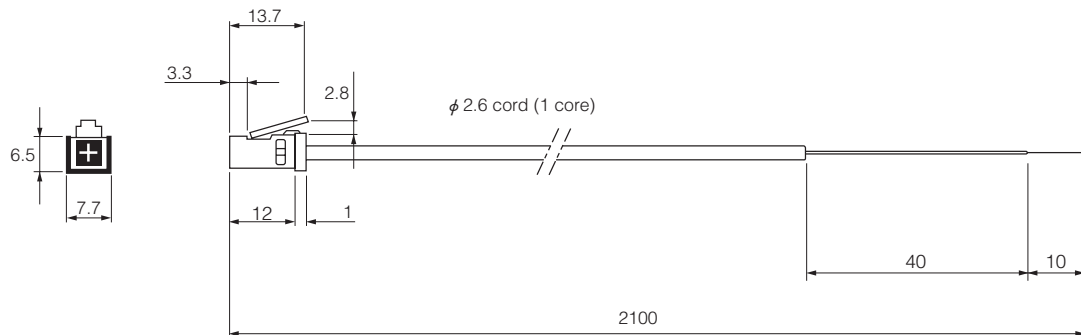
Model F7K-2

Model F7K-3

Model F7K-4

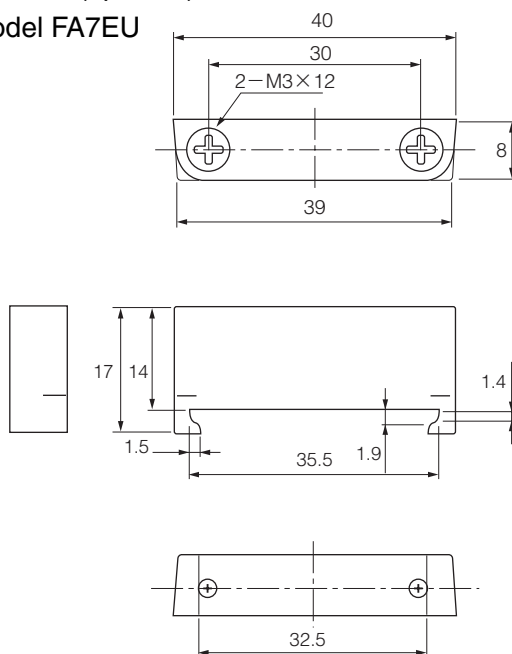


Model F7K-1



End unit (optional)

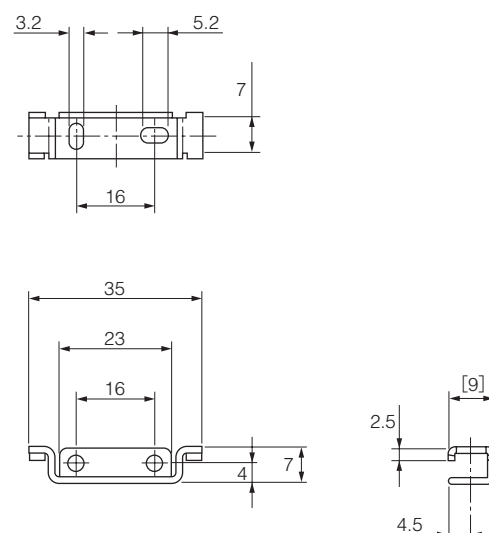
Model FA7EU



(Common to all models)

Mounting bracket (optional)

Model AC-BF2



(Provided as accessory for models other than simplified-wiring connective type)