Digital Fiber Sensor for Leak Detection / Liquid Detection Fibers Only

FX-301-F7 FX-301-F

Related Information
■ General terms and conditions..... F-3
■ Selection guide ..... P.3~
■ Glossary of terms / General precautions....P.1549~ / P.1552~
■ Korea's S-mark P.1602



panasonic.net/id/pidsx/global

CE
Recognition
Certified (**FX-301-F** only)

PNP output type available
Light intensity monitor
Timer
Automatic sensitivity setting

Easy operation even for beginners! Optimum settings can be realized with simple operations

For use with leak detection or liquid detection fiber only

The **FX-301-F7** (Note 1) dedicated for the leak detection fiber **FD-F71** and the **FX-301-F** dedicated for the liquid detection fiber **FT-F93** are available. Optimal setting is possible with easy operation.

Note: The **FX-301-F** can be also used by setting it to leak detection mode. However, the functions are different from the **FX-301-F7** dedicated for the leak detection fiber, so it is recommended to use the **FX-301-F7** when using the leak detection fiber.

Leak detection fiber
FD-F71



Liquid detection fiber
FT-F93



Dedicated amplifier for the leak detection fiber
FX-301-F7

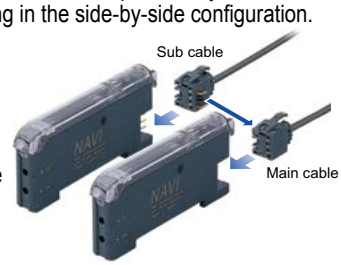


Dedicated amplifier for the liquid detection fiber
FX-301-F



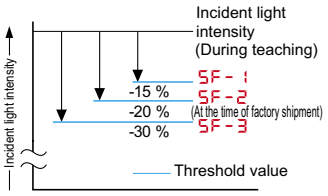
Easy maintenance, as main and sub units are identical

Both main and sub units utilize the same amplifier body. This feature allows for easy mounting in the side-by-side configuration. The main and sub unit functions are distinguished only by the proper use of 3-core main cable and the 1-core sub cable. Moreover, by utilizing the same body for both main and sub units, inventory management and maintenance is simplified.



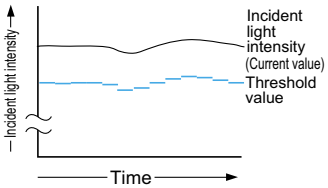
Sets the optimal threshold value FX-301-F7

Threshold value will be set automatically to -20 % of the incident light intensity during the teaching to steadily detect the leak. It is also possible to change the threshold value to -15 % or -30 %.



Threshold follow-up function FX-301-F7

Incident light intensity is checked at regular time interval (10 min.), and threshold value is reset automatically.



*Function is set to OFF at the time of factory shipment.

Flashing function incorporated

When the leak detection fiber is connected (F7 mode), if a leak is detected, you will recognize which fiber detects the leak at a single glance because the emitter will start flashing.

Long life and stable operational settings due to the newly developed emitting element

The newly developed "four-chemical emitting element" used for **FX-301-F7** / **FX-301-F** can suppress the secular change of the light emitting element to minimum, allowing stable detection for long period of time.

Easy to operate with individual / collective teaching mode

Individual teaching mode (TEACH)

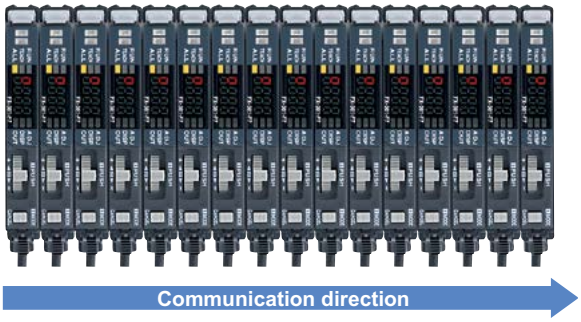
Optimal threshold value is set automatically on **FX-301-F7** just by setting the MODE indicator to "TEACH" and pressing the jog switch.

(The threshold value is set after selecting the liquid detection fiber for **FX-301-F**.)

Collective teaching mode (ALL)

Teaching is performed collectively for all the connected amplifiers with an optical communication function when the MODE indicator is set to "ALL". Each amplifier will be set with an optimal threshold value.

(At the same time, other setting in the master unit will be copied to the slave unit.)



Collective teaching mode is possible for 16 units max.

LEAK DETECTION FIBER (FD-F71)

Low profile liquid detection fiber with high chemical resistance



SEMI S2 compliant!

Leak detection fiber cannot be used in combination with the **FX-100/300/311/410** series.

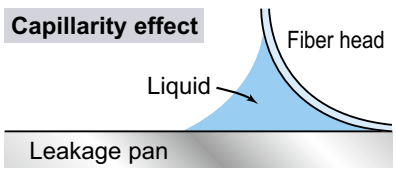
Stable detection performance

The unique effect of capillarity enables reliable detection of small leaks and viscous liquids.





Capillarity effect



Compact, space-saving

This slim (10 mm 0.394 in) side-mounting fiber head is especially good for use in confined spaces.

Labor-saving design

- Because all you need to install is one screw, one-touch mounting of the fiber head is possible.
- Replacement parts even for resetting after a leak are unnecessary.
- Because the fiber head is simply designed, wiping off leaks is rendered easy.

Superb explosion resistance / chemical resistance

Explosion resistance is enhanced by adopting the fiber method (SEMI S2 compliant). The head unit made of fluorocarbon polymers also has superb chemical resistance.

Amplifier Built-in Leak Detection Sensor

High-speed detection
even a little liquid leak

EX-F70 SERIES
EX-F60 SERIES



P.877～

LIQUID DETECTION FIBER (PIPE-MOUNTABLE) (FT-F93)

Stably detect the liquid inside the pipe!



SEMI S2 compliant!

Leak detection fiber cannot be used in combination with the **FX-100/300/311/410** series.

Superior explosion resistance compatible to SEMI S2

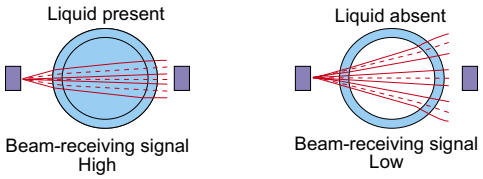
Because there is no electric circuitry in the fiber head, it boasts excellent explosion resistance.

Easy to use and reliable detection

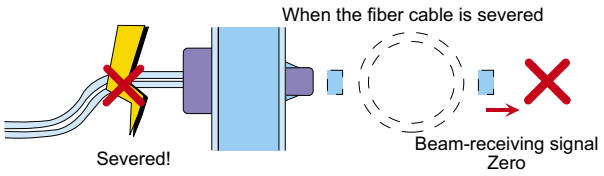
Even when the shape and thickness of the pipe vary, this fiber head uses a method where the beam axis follows the diameter of the pipe, and so when compared to conventional methods, the shape and thickness of the pipe have no influence over the performance of this fiber head.

Stable design that doesn't permit liquid-absent or sensor errors

- When liquid is present, its effect on the lens causes light to focus and enter.



- When abnormalities such as a severed or removed fiber or a cutoff cable occur, light does not enter and the sensor will output the same as "liquid-absent".



Reliable detection not affected by bubbles or droplets

Latest optical fiber techniques have solved problems caused by bubbles, droplets or liquid leakage that arise in conventional pipe-mountable fiber heads.

ORDER GUIDE

Amplifiers

Quick-connection cable is not supplied with the amplifier. Please order it separately.

Type		Appearance	Model No.	Emitting element	Output
Leak detection fiber only	NPN output		**FX-301-F7**	Red LED	NPN open-collector transistor
	PNP output		**FX-301P-F7**		PNP open-collector transistor
Liquid detection fiber only	NPN output		**FX-301-F**	Red LED	NPN open-collector transistor
	PNP output		**FX-301P-F**		PNP open-collector transistor

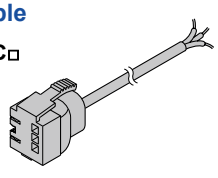
Quick-connection cables

Quick-connection cable is not supplied with the amplifier. Please order it separately.

Type	Model No.	Description	
Main cable (3-core)	**CN-73-C1**	Length: 1 m 3.281 ft	0.2 mm² 3-core cabtyre cable, with connector on one end Cable outer diameter: ø3.3 mm ø0.130 in
	CN-73-C2	Length: 2 m 6.562 ft	
	CN-73-C5	Length: 5 m 16.404 ft	
Sub cable (1-core)	**CN-71-C1**	Length: 1 m 3.281 ft	0.2 mm² 1-core cabtyre cable, with connector on one end Cable outer diameter: ø3.3 mm ø0.130 in
	CN-71-C2	Length: 2 m 6.562 ft	
	CN-71-C5	Length: 5 m 16.404 ft	

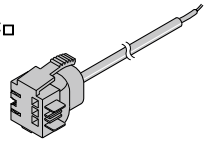
Main cable

- **CN-73-C□**



Sub cable

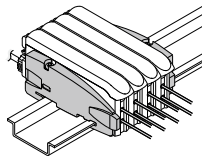
- **CN-71-C□**



ORDER GUIDE

End plates

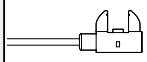
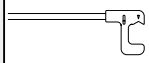
End plates are not supplied with the amplifier. Please order it separately when the amplifiers are mounted in cascade.

Appearance	Model No.	Description
	**MS-DIN-E**	When amplifiers are mounted in cascade, or when an amplifier moves depending on the way it is installed on a DIN rail, these end plates clamp amplifiers into place on both sides. Make sure to use end plates when cascading multiple amplifiers together. 2 pcs. per set

Fiber heads

Tough : Refers to a fiber which possesses both unbreakable (bending radius: R10 mm R0.394 in, reciprocating bending: 180°) and more flexible (bending radius: R4 mm R0.157 in or less) features.

Bending durability : Refers to a fiber which possesses unbreakable bending-resistant feature (bending radius: R10 mm R0.394 in, reciprocating bending: 180°).

Designation	Shape of fiber head (mm in)	Model No.	Bending radius (mm)	Fiber cable length ✂: Free-cut	Description	Protection	Ambient temp.	Dimensions
Leak detection fiber	SEMI S2 compliant W20 × H30 × D10 W0.787 × H1.181 × D0.394 	Tough Bending durability **FD-F71**	R4	✂ 5 m 16.405 ft	Liquid leak detection Leak absent: Beam received, Leak present: Beam not received Dedicated amplifier for the leak detection fiber : **FX-301-F7**	IP67	−20 to +60 °C −4 to +140 °F	P.68
Liquid detection fiber	SEMI S2 compliant W23 × H20 × D17 W0.906 × H0.787 × D0.669 	Tough Bending durability **FT-F93**	Protective tube R20 Fiber R2	✂ 2 m 6.562 ft	Applicable pipe diameter: Outer dia. ø3 to ø10 mm ø0.118 to ø0.394 in Transparent pipe [PFA (fluorine resin) or equivalently transparent pipe, wall thickness 0.3 to 1.0 mm 0.012 to 0.039 in Liquid absent: Beam not received, Liquid present: Beam received] Dedicated amplifier for the liquid detection fiber : **FX-301-F**	IP40	−40 to +60 °C −40 to +140 °F	P.58

About the handling of the fiber cable length changed product

The type with fiber cable length changed is prepared as a semi-custom product with fast response.
Please contact the sales regarding the model name, standard price, and delivery.
- Applicable fiber cable length: Up to 25 m 82.021 ft, in 1 m 3.281 ft intervals.
- Applicable protective tube length: Up to 10 m 32.808 ft, in 0.5 m 1.641 ft intervals.

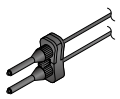
Accessories

FX-CT2 (Fiber cutter)
FX-AT4 (Attachment for ø1 mm ø0.039 in fiber, black)
MS-FD-F7-1 (SUS mounting bracket for **FD-F71**)
MS-FD-F7-2 (PVC mounting bracket for **FD-F71**)

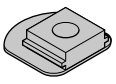
- **FX-CT2**



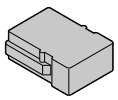
- **FX-AT4**



- **MS-FD-F7-1**
(SUS mounting bracket for **FD-F71**)



- **MS-FD-F7-2**
(PVC mounting bracket for **FD-F71**)

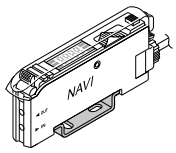


OPTIONS

Designation	Model No.	Description
Amplifier mounting bracket	**MS-DIN-2**	Mounting bracket for amplifier
Fiber sensor amplifier protection seal	**FX-MB1**	10 sets of 2 communication window seals and 1 connector seal Communication window seal: It prevents malfunction due to transmission signal from another amplifier, as well as, prevents effect on another amplifier. Connector seal: It prevents contact of any metal, etc., with the pins of the quick-connection cable.

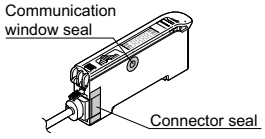
Amplifier mounting bracket

- **MS-DIN-2**



Fiber sensor amplifier protection seal

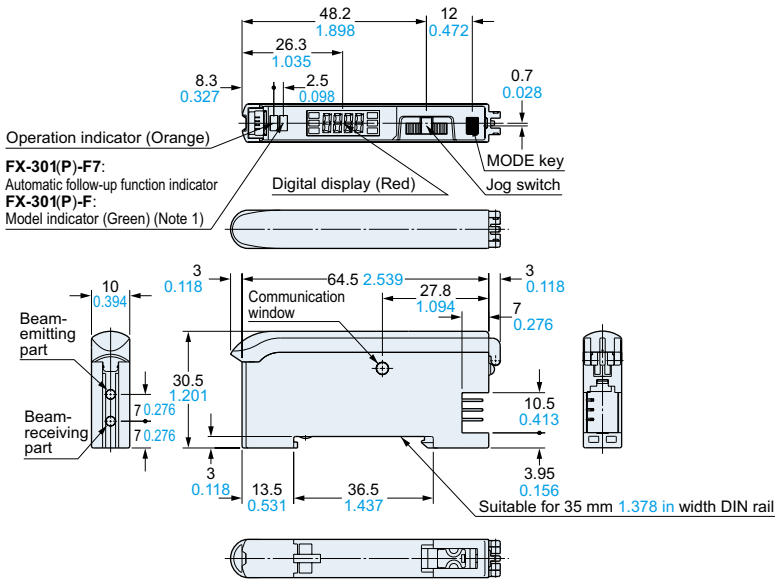
- **FX-MB1**



DIMENSIONS (Unit: mm in)

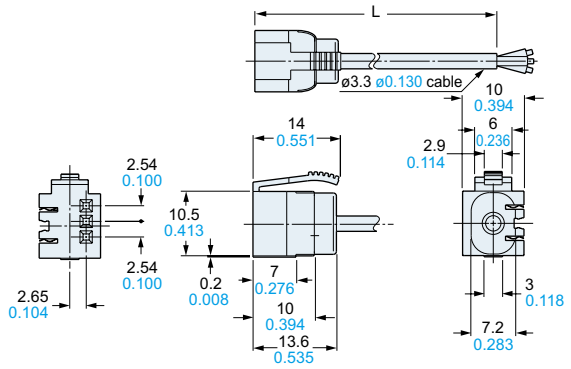
The CAD data can be downloaded from our website.

FX-301(P)-F7 FX-301(P)-F — Amplifier



Note: Above figure is an external dimension drawing of the **FX-301(P)-F7**. Shape of the indicator for **FX-301(P)-F** is little different.

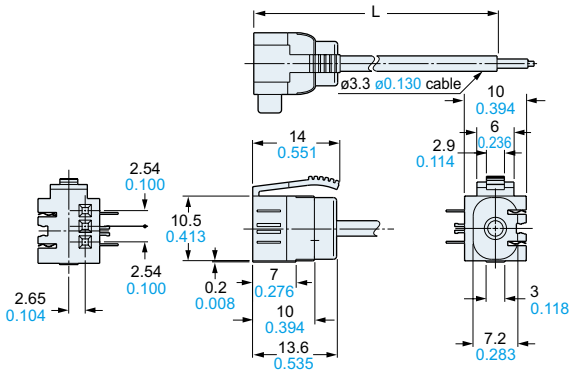
CN-73-C□ — Main cable (Optional)



• Length L

Model No.	Length L
CN-73-C1	1,000 39.390
CN-73-C2	2,000 78.740
CN-73-C5	5,000 196.850

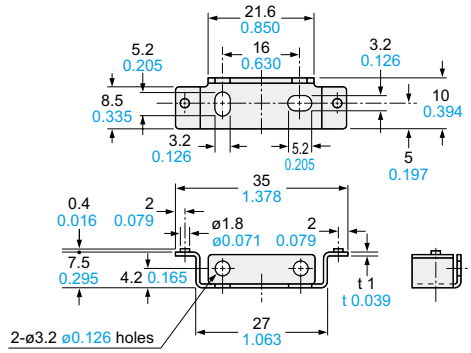
CN-71-C□ — Sub cable (Optional)



• Length L

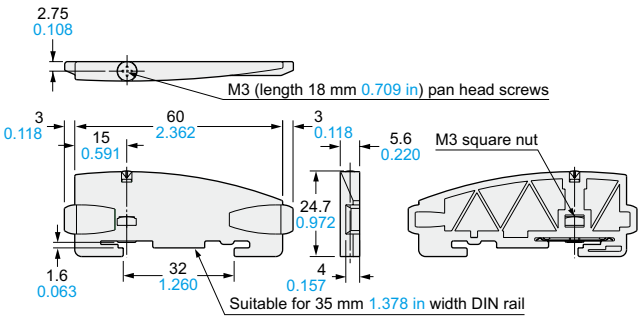
Model No.	Length L
CN-71-C1	1,000 39.390
CN-71-C2	2,000 78.740
CN-71-C5	5,000 196.850

MS-DIN-2 — Amplifier mounting bracket (Optional)



Material: Cold rolled carbon steel (SPCC)
(Uni-chrome plated)

MS-DIN-E — End plates (Optional)



Material: Polycarbonate

DIMENSIONS (Unit: mm in)

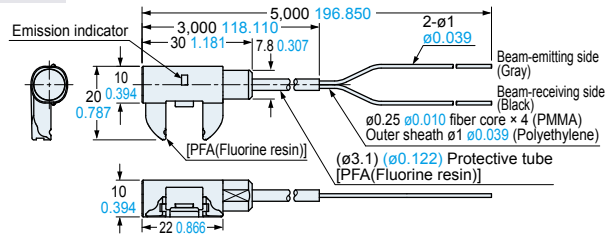
The CAD data can be downloaded from our website.

FD-F71

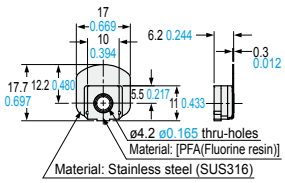
Free-cut

<with **FX-AT4**>

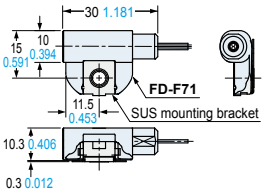
Fiber



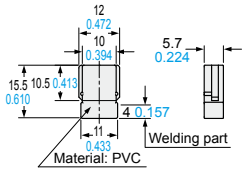
SUS mounting bracket (MS-FD-F7-1)



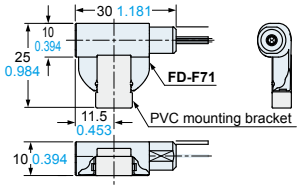
SUS mounting bracket mounting diagram



PVC mounting bracket (MS-FD-F7-2)



PVC mounting bracket mounting diagram



FT-F93

Free-cut

<with **FX-AT4**>

