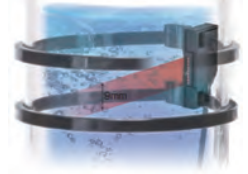


New product introduction
Tough Fiber

Liquid Leak / Liquid Detection

It corresponds to various liquid events, from the contact (wetted) type to the pipe mounting type, and up to leak detection.



Fiber Selection Guide

Model

Choose by shape/application

How to read Model No

Earlier models comparison table

Fibers

Super Quality

Threaded Type

Square Head Type

Cylindrical Type

Sleeve

Flat Type

Small Spot

Narrow Beam

Wide Beam

Convergent Reflective Type

Retroreflective Type

Chemical / Oil-resistant

Heat-resistant

Vacuum-resistant

Liquid Leak / Liquid Detection

Fiber Options

Semi-custom fibers

Fiber Dimensions

Thru-beam Type

Retroreflective Type

Reflective Type

Others

Amplifiers

FX-500 series

FX-100 series

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For detecting the upper limit of liquid surface level, sensor that receives beam when “liquid is absent” is recommended.

The sensor will turn OFF during abnormal conditions (excess fluid, fiber disconnection, etc.)!
Liquid absent: Beam received (Output ON)
Liquid present / fiber is cutoff: Beam not received (Output OFF)

FD-FA93 Strong against air bubbles

Applicable pipe: Transparent pipe, Outer diameter $\varnothing 8$ mm $\varnothing 0.315$ in or more
(When used with the tying bands: $\varnothing 8$ to $\varnothing 80$ mm $\varnothing 0.315$ to $\varnothing 3.150$ in)

FD-F41

Standard type

FD-F4

For 1 mm 0.039 in thick pipes manufactured by PFA



For detecting the lower limit of liquid surface level, sensor that receives beam when “liquid is present” is recommended.

The sensor will turn OFF during abnormal conditions (insufficient liquid, fiber disconnection, etc.)!
Liquid present: Beam received (Output ON)
Liquid absent / fiber is cutoff: Beam not received (Output OFF)

FT-F93 Thru-beam



Full-protection type

FD-HF40Y / FD-F41Y (Liquid level sensing) Metal-free

Small diameter type
($\varnothing 4$ mm $\varnothing 0.157$ in)

Bends easily with its small bending radius, protective tube is cuttable and extendable

FD-HF40Y

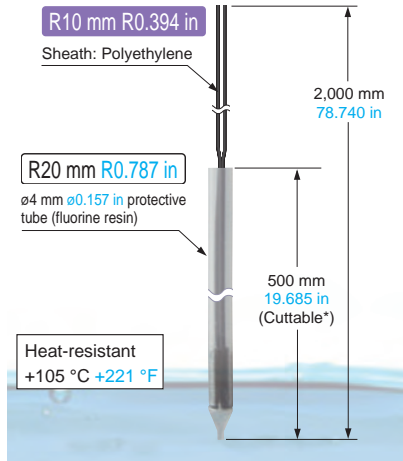
R10 mm R0.394 in

Sheath: Polyethylene

R20 mm R0.787 in

$\varnothing 4$ mm $\varnothing 0.157$ in protective tube (fluorine resin)

Heat-resistant
+105 °C +221 °F



FD-F41Y

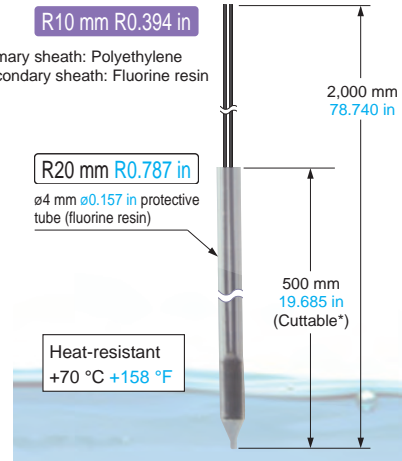
R10 mm R0.394 in

Primary sheath: Polyethylene
Secondary sheath: Fluorine resin

R20 mm R0.787 in

$\varnothing 4$ mm $\varnothing 0.157$ in protective tube (fluorine resin)

Heat-resistant
+70 °C +158 °F



* The range of 50 mm 1.969 in from the fiber tip cannot be cut. Also, fiber length can be extended using MS-FX-02Y (optional).

Full-protection type

FD-F71 (Liquid level sensing) SEMI S2 compliant

Detect chemical leaks in semiconductor and LCD manufacturing processes.

Compact, space-saving

Side-mountable fiber head as slim as 10 mm 0.394 in is good to use in confined spaces.

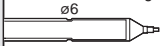


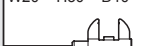



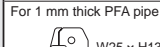


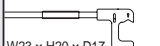
Ideal for use with chemicals and volatile materials

This fiber type sensor is safer to use with volatile materials (SEMI S2 compliant). The fluorine resin fiber head makes it ideal for use with chemicals.



LIST OF FIBERS

Reflective type / Thru-beam type

Type	Shape of fiber head (mm)	Model No.	Bending radius (mm)	Fiber cable length ✂ Free-cut	Description		Protection	Ambient temp.	Dimensions
					FX-500 series (STD mode)	FX-101 FX-102			
Contact type	Liquid level sensing 	Heat resistant 125 °C Fluorine resin coating ø6	FD-F8Y	Protective tube R40 Fiber R15	 2 m (Note 1)	ø6 mm ø0.236 in Protective tube: Fluorine resin, length 1,000 mm 39.370 in (not cuttable) Liquid surface not contacted: Beam received, Liquid surface contacted: Beam not received	IP68	-40 to +125 °C	P.59
		Heat resistant 105 °C Fluorine resin coating Metal-free ø4	FD-HF40Y (Note 2)	Protective tube R20 Fiber R10	 2 m	ø4 mm ø0.157 in Protective tube: Fluorine resin, length 500 mm 19.685 in (cuttable) Liquid surface not contacted: Beam received, Liquid surface contacted: Beam not received	IP68G	-40 to +105 °C	P.61
		Heat resistant 70 °C Fluorine resin coating throughout the fiber Metal-free ø4	FD-F41Y (Note 2)			ø4 mm ø0.157 in Protective tube: Fluorine resin, length 500 mm 19.685 in (cuttable) Liquid surface not contacted: Beam received, Liquid surface contacted: Beam not received			
Liquid leak detection	SEMI S2 compliant W20 × H30 × D10 	Tough FD-F71	R4 Bending durability	 5 m	Liquid leak detection Leak absent: Beam received, Leak present: Beam interrupted Compatible amplifire: FX500 series only	IP67	-20 to +60 °C		
Pipe-mountable type	Liquid level sensing	Standard  W25 × H13 × D20	FD-F41	R10	 2 m	Applicable pipe diameter: Outer dia. ø6 to ø26 mm ø0.236 to ø1.024 in transparent pipe [PVC (vinyl chloride), fluorine resin, polycarbonate, acrylic, glass, wall thickness 1 to 3 mm 0.039 to 0.118 in] Liquid absent: Beam received, Liquid present: Beam not received	-	-40 to +100 °C	P.59
		For 1 mm thick PFA pipe  W25 × H13 × D20	FD-F4			Applicable pipe diameter: Outer dia. ø6 to ø26 mm ø0.236 to ø1.024 in transparent pipe [PFA (fluorine resin) or equivalently transparent pipe, wall thickness 1 mm 0.039 in] Liquid absent: Beam received, Liquid present: Beam not received			
	Liquid sensing	Mountable on pipe-array fiber  W6.5 × H28.3 × D17	Tough FD-FA93	R4 Bending durability	 2 m	Applicable pipe diameter: Outer dia. ø8 mm ø0.315 in or more transparent pipe (When used with the tying bands: ø8 to ø80 mm ø0.315 to ø3.150 in) [PFA (fluorine resin), including translucent] Liquid absent: Beam received, Liquid present: Beam not received	IP40	-40 to +70 °C	P.49
		SEMI S2 compliant  W23 × H20 × D17	Tough FT-F93	Protective tube R20 Fiber R2 Bending durability		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 mm 0.012 to 0.039 in] Liquid absent: Beam not received, Liquid present: Beam received Compatible amplifire: FX500 series only			

Notes: 1) The allowable cutting range is 1,000 mm **39.370 in** from the end that the amplifire inserted.
2) Liquid inflow prevention joint, protective tube extension joint, fiber mounting joint is available.

Accessories for additional supply

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

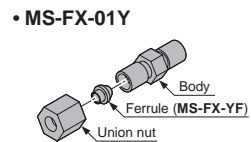
• **MS-FD-F7-2**
(PVC mounting bracket for FD-F71) 

FIBER OPTIONS

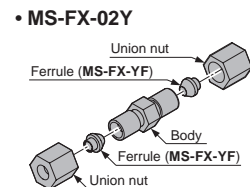
Designation	Model No.	Description	
Liquid inflow prevention joint (Note)	MS-FX-01Y	Applicable fibers FD-HF40Y FD-F41Y	This joint suppresses false operations due to liquid slip-in from the top of the protective tube.
Protective tube extension joint (Note)	MS-FX-02Y		The protective tube can be extended.
Fiber mounting joint (Note)	MS-FX-03Y		The joint is used for mounting fibers on a tank.

Note: The joint internal ferrule (**MS-FX-YF**) is available as a spare part. A distorted ferrule may result in leakage.

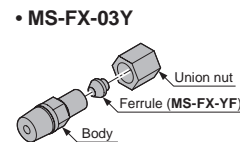
Liquid inflow prevention joint



Protective tube extension joint

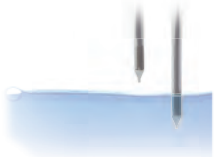


Fiber mounting joint



Applications

Detecting liquid level in a tank



Leak detection for use in semiconductor device manufacturing



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.

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