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)

**FT-F93**
- Thru-beam

**FD-FA93**
- Strong against air bubbles

Applicable pipe: Transparent pipe, Outer diameter ø8 mm ø0.315 in or more
(When used with the tying bands: ø8 to ø80 mm ø0.315 to ø3.150 in)

**FD-F41**
- Standard type
  - For 1 mm 0.039 in thick pipes manufactured by PFA

**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

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

**FD-HF40Y**
- Small diameter type
  - (ø4 mm ø0.157 in)
  - Bends easily with its small bending radius, protective tube is cuttable and extendable
  - R10 mm R0.394 in
  - Sheath: Polyethylene
  - 2,000 mm 78.740 in

**FD-F41Y**
- Small diameter type
  - (ø4 mm ø0.157 in)
  - R20 mm R0.787 in
  - ø4 mm ø0.157 in protective tube (fluorine resin)
  - 500 mm 19.685 in (Cuttable*)
  - 2,000 mm 78.740 in

- Heat-resistant +105 °C +221 °F
- 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).

**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

<table>
<thead>
<tr>
<th>Type</th>
<th>Shape of fiber head (mm)</th>
<th>Model No.</th>
<th>Bending radius (mm)</th>
<th>Fiber cable length</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat resistant 125 °C Fluorine resin coating</td>
<td>FD-F8Y</td>
<td>Protective tube R40 Fiber R15</td>
<td>2 m (Note 1)</td>
<td>ø6 mm ø0.236 in Liquid surface not contacted: Beam received, Liquid surface contacted: Beam not received</td>
<td></td>
</tr>
<tr>
<td>Heat resistant 105 °C Fluorine resin coating Metal-free</td>
<td>FD-HF40Y</td>
<td>Protective tube R20 Fiber R15</td>
<td>2 m (Note 2)</td>
<td>ø6 mm ø0.236 in Liquid surface not contacted: Beam received, Liquid surface contacted: Beam not received</td>
<td></td>
</tr>
<tr>
<td>Heat resistant 70 °C Fluorine resin coating throughout the fiber Metal-free</td>
<td>FD-F41Y</td>
<td>Protective tube R10 Fiber R40</td>
<td>2 m (Note 2)</td>
<td>ø6 mm ø0.236 in Protective tube: Fluorine resin, length 500 mm. 19.685 in (cuttable) Liquid surface not contacted: Beam received, Liquid surface contacted: Beam not received</td>
<td></td>
</tr>
</tbody>
</table>

Notes: 1) The allowable cutting range is 1,000 mm 39.370 in from the end that the amplifier 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

<table>
<thead>
<tr>
<th>Designation</th>
<th>Model No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid inflow prevention joint (Note)</td>
<td>MS-FX-01Y</td>
<td>This joint suppresses false operations due to liquid slip-in from the top of the protective tube.</td>
</tr>
<tr>
<td>Protective tube extension joint (Note)</td>
<td>MS-FX-02Y</td>
<td>The protective tube can be extended.</td>
</tr>
<tr>
<td>Fiber mounting joint (Note)</td>
<td>MS-FX-03Y</td>
<td>The joint is used for mounting fibers on a tank.</td>
</tr>
</tbody>
</table>

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

Applications

Detecting liquid level in a tank
- MS-FX-01Y

Leak detection for use in semiconductor device manufacturing
- MS-FX-02Y

- MS-FX-03Y

Tough: Refers to a fiber which possesses both unbreakable (bending radius: R10 mm ø0.236 in, reciprocating bending: 180°) and more flexible (bending radius: R4 mm ø0.157 in or less) features.