Panasonic **INSTRUCTION MANUAL**

Liquid Level Detection Fiber **FD-F8Y**

CMJE-FDF8Y No.0054-42V

Thank you very much for purchasing Panasonic products. Please read this Instruction Manual carefully and thoroughly for the correct and optimum use of this product. Kindly keep this manual in a convenient place for quick reference.

Please refer to the instruction manual enclosed with the fiber sensor amplifier.

1 SPECIFICATIONS

Type / Item / Model No.	Refelctive
	FD-F8Y
Applicable fiber amplifiers	**FX-301(P)**, **FX-311(P)**
Sensing object	Liquid (Note 1)
Repeatability	0.5mm or less (with water)
Allowable bending radius	Tube: R40mm or more (Do not bend 26mm length from the tip) Fiber cable: R15mm or more
Fiber cable length	2m free-cut [Do not cut the tube (Note 2)]
Ambient temperature (Note 3) (Note 4)	-40 to +125°C (No dew condensation or icing allowed), Storage: -40 to +125°C
Ambient humidity	35 to 85% RH, Storage: 35 to 85% RH
Ambient pressure (Note 4)	-49 to +490kPa
Material	Tube: Fluorine resin, Fiber sheath: Polypropylene
Accessory	**FX-CT2** (Fiber cutter): 1 pc. **FX-AT3** (ø2.2mm fiber attachment): 1pc.

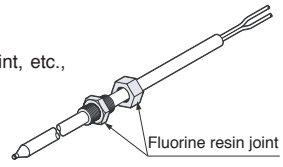
Notes: 1) Unclear liquid may not be sensed stably.
2) 1,000mm from the amplifier insertion end is the cutting range.
3) Liquid being detected should also be kept within the rated ambient temperature range.
4) The ambient temperature and pressure under which these devices are used are set separately.
For usage with both of these at or near the maximum permissible value, please contact our office.

2 CAUTIONS

- Take care that unclear liquid may not be sensed stably.
- Take care that the tube may stretch by maximum 2% of the total length if it is used at a high temperature.
- Bending radius of the fiber cable must be R15mm or more (tube: R40mm or more). However, do not bend 26mm length from the tip.
If the bending radius is smaller than the specified value, the sensing performance may deteriorate.
- Do not use the fiber at places having intense vibrations, as this can cause malfunction.
- Keep the fiber head surface intact. If it is scratched or spoiled, the detectability will deteriorate.
- Ensure that any strong extraneous light is not incident on the receiving face of the fiber head.
- Do not apply excessive tensile force to the fiber cable.
- Take care that the sensor is not directly exposed to fluorescent light from a rapid-starter lamp or a high frequency lighting device, as it may affect the sensing performance.

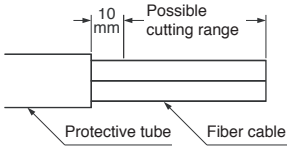
3 MOUNTING

- Use a commercially available fluorine resin joint, etc., to install **FD-F8Y**.



4 CUTTING FIBER CABLE

- The fiber cables should be cut off at the ends with the fiber cutter **FX-CT2** (accessory) before insertion into the fiber amplifier.
- For the usage of the fiber cutter (**FX-CT2**), refer to the instruction manual enclosed with this product other than this instruction manual.
- Do not scratch the fiber sheath while cutting the fluorine resin tube.



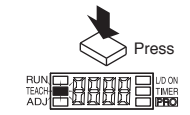
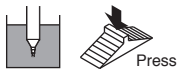
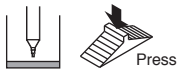
5 SENSITIVITY SETTING

Do not move or bend the fiber cable after the sensitivity setting. Detection may become unstable.

When using the FX-301(P)

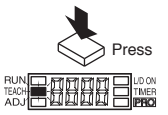
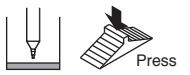
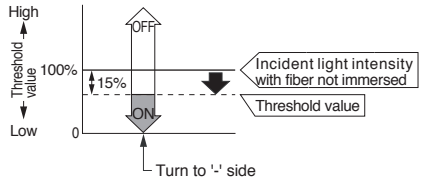
<2-level teaching>

- This is the method of setting the threshold value by teaching two levels, corresponding to the immersed and not immersed conditions. Normally, setting is done by this method.

Step	Display	Description
①	3000	・ The fibers are mounted in the tank. ・ Press MODE key to light up MODE indicator / TEACH (yellow). 
②	0	・ Press jog switch in the fiber immersed condition. ・ If the teaching is accepted, the read incident light intensity blinks in the digital display. 
③	3000	・ MODE indicator / TEACH (yellow) blinks. ・ Press jog switch in the fiber not immersed condition. 
④	Good HArd	・ If the teaching is accepted, the read incident light intensity blinks in the digital display and the threshold value is set at the mid-value between the incident light intensities in the immersed and the not immersed conditions. After this, the judgment on the stability of sensing is displayed. In case stable sensing is possible: 'Good' is displayed. Stability indicator (green) blinks. In case stable sensing is not possible: 'HArd' is displayed. Stability indicator (green) is off.
⑤	1500	・ The threshold value is displayed.
⑥	----	・ '----' blinks in the digital display.
⑦	3000	・ The incident light intensity appears in the digital dispaly and the setting is complete.

<Limit teaching>

- This is the method of setting the threshold value by teaching only the water absent condition (not immersed condition).

Step	Display	Description
①	3000	・ The fibers are mounted in the tank. ・ Press MODE key to light up MODE indicator / TEACH (yellow). 
②	3000	・ Press jog switch in the not immersed condition. ・ If the teaching is accepted, the read incident light intensity blinks in the digital display. 
③	3000	・ MODE indicator / TEACH (yellow) blinks. ・ Turn jog switch to the '-' side.
④	,	・ If jog switch is turned to the '-' side, ' , ' scrolls (twice) the digital display from left to right, and the threshold level is shifted to a value approx. 15% lower (higher sensitivity) than that set at ②. (Note)  
⑤	Good HArd	・ After this, the judgment on the setting shift amount can be shifted or not is displayed. In case shifting is possible: 'Good' is displayed. In case shifting is not possible: 'HArd' is displayed.
⑥	2550	・ The threshold value is displayed.
⑦	----	・ '----' blinks in the digital display.
⑧	3000	・ The incident light intensity appears in the digital dispaly and the setting is complete.

Note: The approx. 15% amount of shift is the initial value. The amount of shift can be changed in the PRO mode from approx. 5 to 80% (5% step).
Refer to '**our web site (http://panasonic.net/id/pidsx/global)**' for the setting method.

When using the FX-311(P)

- Adjust the sensitivity, observing the operation indicator (orange).
  However, since the condition for lighting up of the indicator depends on the combination of the sensing condition and selected operation for L/D-ON, verify it from the table on the right.
- The sensitivity adjuster is a 12-turn potentiometer. The maximum sensitivity is obtained by turning it fully clockwise.
- The pointer shows the present sensitivity level.

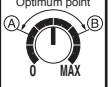
☀: Lights up, ○ : Lights off

Sensing condition	MODE	Operation indicator
Immersed	L-ON (ON when not immersed)	○
	D-ON (ON when immersed)	☀
Not immersed	L-ON (ON when not immersed)	☀
	D-ON (ON when immersed)	○

<Assist function>

- This product incorporates an 'assist function', which helps to easily search the optimum sensitivity position by blinking of the pointer.
  In order to make 'assist function' effective, switch the operation selection switch in the order L-ON (not immersed ON) → D-ON (immersed ON) → L-ON (not immersed ON).

Notes: 1) 'Assist function' turns off automatically once the sensitivity adjustment has been completed.
2) In case 'assist function' is not to be used, set the operation selection switch to D-ON (immersed ON) and wait for 2 sec., or more, to make 'assist function' ineffective.

Step	Sensing method	Operation	Sensitivity indicator
①	★ Make sure that the operation selection switch is set to L-ON (not immersed ON). In case 'assist function' is to be used, switch the operation selection switch in the order of L-ON → D-ON → L-ON.	Turn the sensitivity adjuster fully counterclockwise. (Minimum sensitivity)	
②	Fiber not immersed 	In the fiber not immersed condition, slowly turn the adjuster clockwise and find the point Ⓐ where the sensor is switched ON. The pointer blinks once at the point Ⓐ. (Note 1)	
③	Fiber immersed 	In the fiber immersed condition, slowly turn the adjuster further clockwise until the sensor goes into the ON state again. Once it is switched on, turn the adjuster counterclockwise a little and find the point Ⓑ where it is switched OFF. The pointer blinks twice at the point Ⓑ. (Note 1) If the sensor does not go into the ON state, MAX is the point Ⓑ.	
④	———	Turn the adjuster towards the point Ⓐ from the point Ⓑ slowly. The pointer starts blinking when it approaches the optimum sensitivity point and blinks faster at the optimum sensitivity point for 3 sec. This point is the optimum sensitivity point. (Note 2)	
⑤	Select either L-ON (not immersed ON) or D-ON (immersed ON) according to your application.		

Notes: 1) When 'assist function' is not used, the pointer does not blink.
2) When 'assist function' is not used, the middle point of Ⓐ and Ⓑ is regarded as the optimum sensitivity point.
3) In order to protect the mechanism, the sensitivity adjuster idles when over turned, which may result in a backlash of 1 to 2 divisions.
4) Depending upon the sensing conditions, stable sensing may be possible at a position which is slightly shifted from the optimum sensitivity point.

Troubleshooting

- **In case output chatter is caused by a liquid drop on the fiber head:**
  FX-301(**P**):
  Use the limit teaching, or the timer function.
  FX-311(**P**):
  Turn the sensitivity adjuster further clockwise to raise the sensitivity level, or use the timer function.
- **In case the tank bottom, etc., gets sensed:**
  Readjust the sensitivity after setting at the actual depth at which detection is to be done.

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http://panasonic.net/id/pidsx/global

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