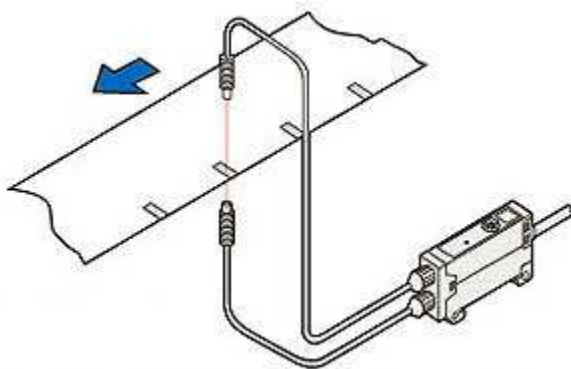


**High-speed response time: 15  $\mu$ s (FX2-A3R)**

**LED sensing type (FX2-A3R-LED) is also available**

## DESCRIPTION

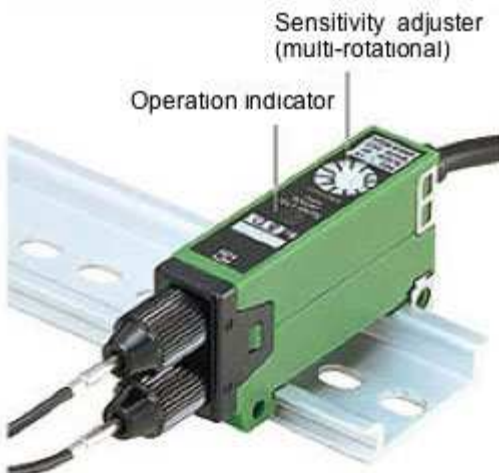
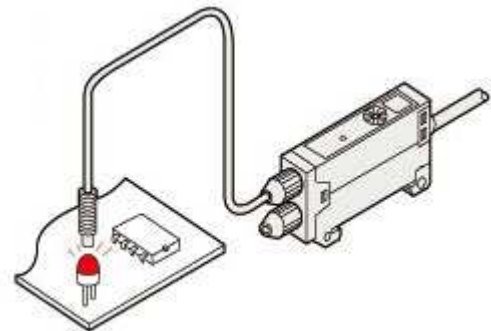
Lineup of high-speed response time: 15 $\mu$ s type (FX2-A3R) and LED sensing type (FX2-A3R-LED)



It has a high-speed response time of 15 $\mu$ s (in light receiving condition), and is suitable for detecting small objects or objects traveling at high-speed.

Note: FX2-A3R-LED response time is 50ms.

LED sensing type, which can detect weak lighting from LED, is also available.



The sensor has a multi-rotational adjuster for fine sensitivity adjustment. Moreover, the idling mechanism of the adjuster makes it free from damage due to over-turning.



[FX-LE1 (expansion lens)]

It expands the sensing range.

[FX-SV1 (side view lens)]

Light is bent at right angle direction to perfectly fit in narrow spaces.



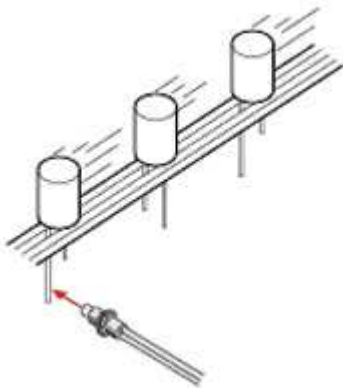
[FX-MR1 (pinpoint spot lens)]

With a spot diameter:  $\varnothing 0.5\text{mm}$ , it is best effective in detecting minute objects or small marks.

## APPLICATIONS

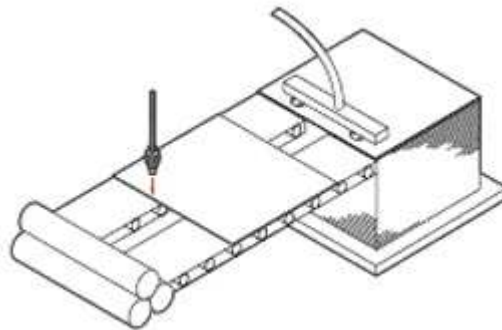
### Detection of capacitor leg pins

(FX2-A3R)



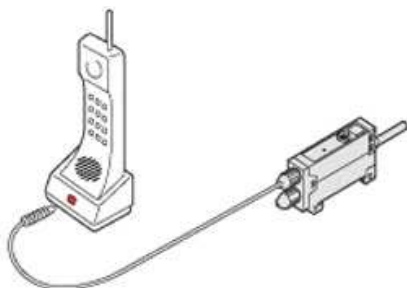
### Checking of printer feed paper

(FX2-A3R)



### Checking of LED light of cordless telephone

(FX2-A3R-LED)



# SPECIFICATIONS

## Fibers

Type	For high-speed type		For LED sensing type
	Thru-beam type with lens	Reflective type	
Model No.	<b>FT-SFM2L</b>	<b>FD-G500</b>	<b>FT-FM2 (Note 5)</b>
Sensing range	50 mm <b>1.969 in</b> (Note 2)	4 mm <b>0.158 in</b> (Convergent point: 1.5 mm <b>0.059 in</b> ) (Note 3)	Using a combination of FT-FM2 and FX-LE1, amber colored LED having a luminous intensity of 2 mcd or more (peak wavelength: 590 nm <b>0.023 mil</b> ) can be detected. (Setting distance: 10 mm <b>0.394 in</b> , with no extraneous light)
Min. sensing object (Note 4)	ø2 mm <b>ø0.079 in</b> opaque object	ø0.05 mm <b>ø0.002 in</b> copper wire	-
Hysteresis	-	10 % or less of operation distance (Note 3)	-
Fiber cable length	2 m <b>0.079 ft</b> free-cut	500 mm <b>19.685 in</b>	2 m <b>0.079 ft</b> free-cut
Allowable bending radius	R25 mm <b>0.984 in</b> or more		
Ambient temperature	-40 to +70 °C <b>-40 to +158 °F</b> (No dew condensation or icing allowed), Storage: -40 to +70 °C <b>-40 to +158 °F</b>		
Material	Fiber core: Acrylic, Sheath: Polyethylene		
Fiber head dimensions	ø2.5 x 8 mm <b>ø0.098 x 0.315 in</b>	M4 x 25 mm <b>0.984 in</b>	M4 x 15 mm <b>0.984 in</b>
Accessories	FX-CT2 (fiber cutter): 1 pc. Fiber attachment: 1 set (Note 6)	M4 Nut: 2 pcs. Toothed lock washer: 1 pc.	M4 Nut: 4 pcs., Toothed lock washer: 2 pcs. FX-CT2 (fiber cutter): 1 pc. Fiber attachment: 1 set (Note 6)

### Notes:

- 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +23 °C **+73.4 °F**.
- 2) Please take care that the sensing range of the free-cut type fiber may be reduced by 20 % max. depending upon how the fiber is cut.
- 3) The sensing range and the hysteresis of reflective type are specified for white non-glossy paper (15 x 15 mm **0.591 x 0.591 in**) as the object.
- 4) The minimum sensing object size of reflective type is the value for type at maximum sensitivity. Also, note that the corresponding setting distance is different from the rated sensing distance.
- 5) Two fibers make up one set for the FT-FM2. However, when using it together with the LED sensing type (FX2-A3R-LED), only one fiber is used.
- 6) The fiber attachment is not used with the FX2 series.



## Amplifiers

Type	High-speed type	LED sensing type
Model No.	<b>FX2-A3R</b>	<b>FX2-A3R-LED</b>
Supply voltage	12 V DC $\pm$ 10 % Ripple P-P 10 % or less	12 to 24 V DC $\pm$ 10 % Ripple P-P 10 % or less
Power consumption	55 mA or less	20 mA or less
Output	NPN transistor universal • Maximum sink current: 100 mA • Residual voltage: 1.0 V or less (at 100 mA sink current) 0.4 V or less (at 16 mA sink current)	
Output operation	Selectable either Light-ON or Dark-ON, by the control input	
Response time	In light state: 15 $\mu$ s or less, In dark state: 35 $\mu$ s or less	In light state: 50 ms or less, In dark state: 100 ms or less
Operation indicator	Red LED (lights up when the output is ON)	
Sensitivity adjuster	3-turn endless potentiometer	
Protection	IP66 (IEC) (Note 2)	IP62 (IEC)
Ambient temperature	-10 to +50 °C <b>-14 to +122 °F</b> (FX2-A3R-LED: 0 to +50°C <b>+32 to +122 °F</b> ) (No dew condensation or icing allowed), Storage: -30 to +70 °C <b>-22 to +158 °F</b>	
Ambient luminance	500 lx	-
Emitting / Receiving element	Emitting element: Red LED (Peak emission wavelength: 660 nm <b>0.026 mil</b> , non-modulation)	Receiving element: Photodiode (Peak wavelength: 590 nm <b>0.023 mil</b> )
Material	Polycarbonate	
Weight	Net weight: 120 g approx.	
Dimensions	W14 x H30 x D56 mm <b>W0.551 x H1.181 x D2.205 in</b>	
Accessories	MS-FX-1 (Amplifier mounting bracket): 1 set, Adjusting screwdriver: 1 pc., Adjusting knob: 1 pc.	




### Notes:

- 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +23 °C **+73.4 °F**.
- 2) This is the value when the combination fiber has been attached. However, the value is IP65 when combined with the free-cut type fiber.
- 3) The voltage withstands ability and the insulation resistance values given in the above table are for the amplifier only.

## OPTIONS

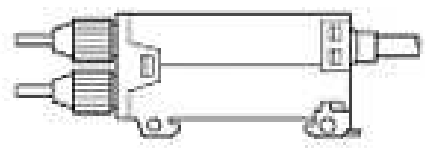
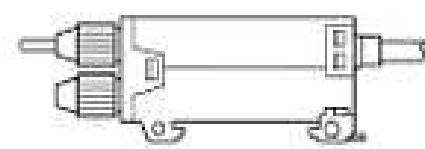
Designation	Model No.	Description	
		Applicable fibers	
Expansion lens	FX-LE1	FT-FM2	<ul style="list-style-type: none"> <li>• Sensing range (FX2-A3R-LED + FT-FM2): 10 mm 0.394 in</li> <li>• Ambient temperature: -60 to +350 °C -76 to +662 °F</li> <li>• Ambient humidity: 35 to 85 % RH</li> </ul> 
Pinpoint spot lens	FX-MR1	FD-G500	<ul style="list-style-type: none"> <li>• Enables detection of minute objects or small marks.</li> <li>• Spot diameter: <math>\phi 0.5</math> mm <math>\phi 0.020</math> in approx.</li> <li>• Distance to focal point: <math>6 \pm 1</math> mm <math>0.236 \pm 0.039</math> in</li> <li>• Ambient temperature: -60 to +300 °C -76 to +572 °F</li> <li>• Ambient humidity: 35 to 85 % RH</li> </ul> 

## ORDER GUIDE

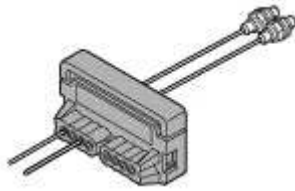
Type		Shape of head (mm in)	Sensing range (Note 1) [ ( ) is min. sensing object ]	Characteristics	Fiber cable length Free-cut	Model No.
For high-speed type	Thru-beam type with lens	 $\phi 2.5$ $\phi 0.098$	1.969 in 50mm [ $\phi 2$ mm $\phi 0.079$ in opaque object]	• Long range • Free-cut type	2m 6.562 ft	FT-SFM2L
	Reflective type	Coaxial • Lens mountable 	0.157 in 4mm [ $\phi 0.05$ mm $\phi 0.002$ in copper wire]	• Coaxial reflective type enables highly-precise position determination	500mm 19.685 in	FD-G500
For LED sensing type		Lens mountable  M4	Detectable when used in combination of FX-LE1, amber LED (peak wavelength 590 nm 0.023 mil) of light intensity of 2mcd or more (Sensing range of 10 mm 0.394 in with no ambient light)	• Free-cut type	2m 6.562 ft	FT-FM2 (Note 2)

Notes:

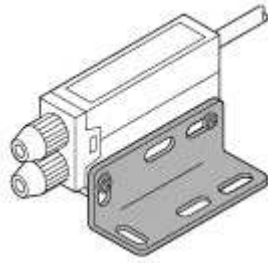
- 1) Please note that the sensing range of free-cut fiber may be reduced by 20 % max. depending upon how the fiber is cut.
- 2) FT-FM2 comes in a set of two. However, when used in combination with LED sensing type FX2-A3R-LED, please use just one fiber.

Type	Appearance	Model No.	Response time (In light receiving condition)
For high-speed type		FX2-A3R	15 $\mu$ s or less
For LED sensing type		FX2-A3R-LED	50 ms or less

FX-CT2 (Fiber cutter)

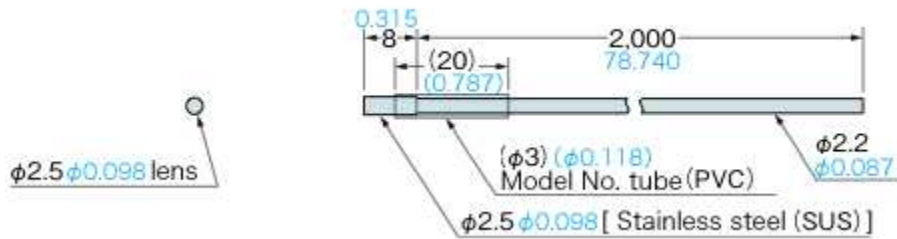


MS-FX-1 (Amplifier mounting bracket)

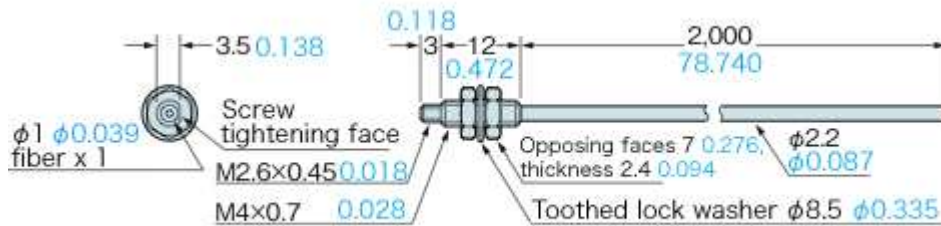


## DIMENSIONS (Unit: mm in)

Thru-beam type fiber

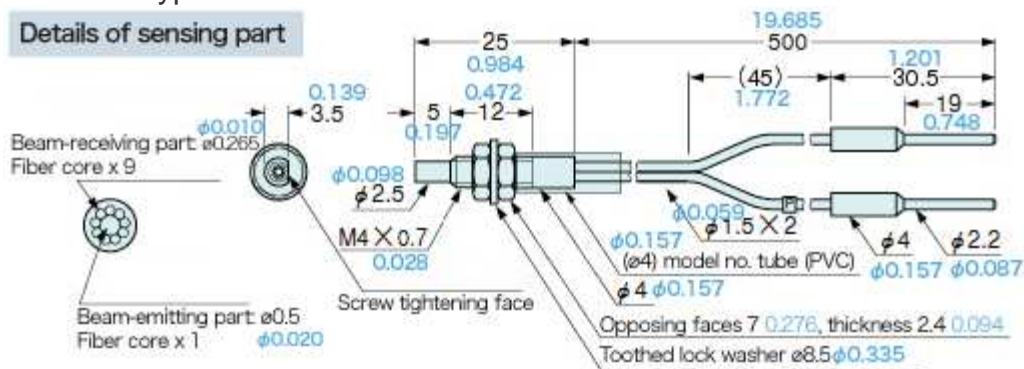


Thru-beam type fiber

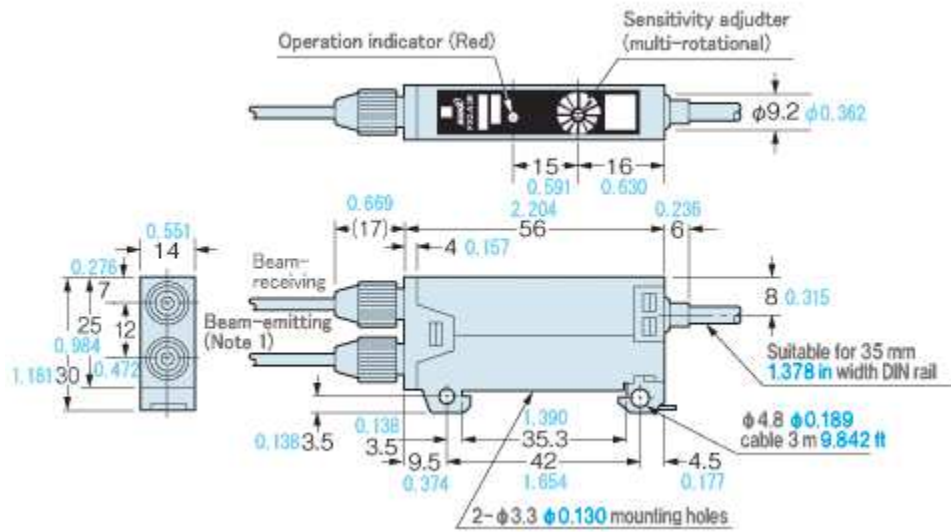


Reflective type fiber

### Details of sensing part



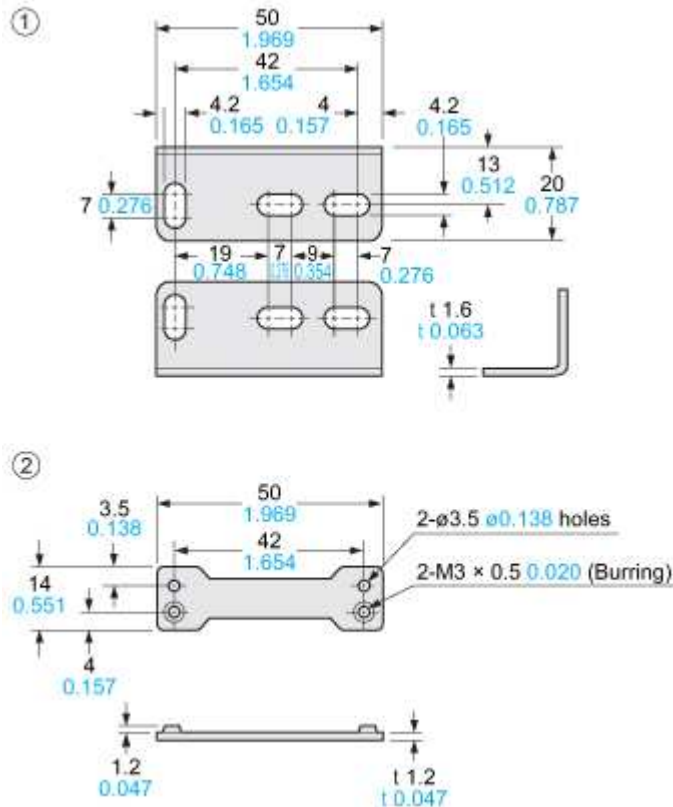
# Amplifier



Note:

Emitting part of FX2-A3R-LED is not to be equipped with a fiber.

## Amplifier mounting bracket (Accessory for Amplifier)



Material:

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

Two M3 (length 20 mm 0.787 in) screws with washers are attached.

Assembly dimensions

