
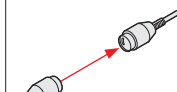


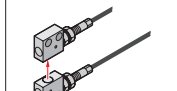


## FIBER OPTIONS

## Lens (For thru-beam type fiber)

The dimensions are on p.120~.

Designation	Model No.	Description																																																																																																										
Expansion lens (Note 1)	FX-LE1		Increases the sensing range by 5 times or more.  • Ambient temperature: -60 to +350 °C -76 to +662 °F (Note 5)	Sensing range for FX-300 red LED type (mm) [Lens on both sides] (Note 3)																																																																																																								
				<table><tr><th>Fiber</th><th>Mode</th><th>U-LG</th><th>LONG</th><th>STDF</th><th>STD</th><th>FAST</th><th>S-D</th><th>H-SP</th></tr><tr><td>FT-B8</td><td></td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,000</td><td>2,500</td><td>2,000</td><td>1,000</td><td>1,000</td></tr><tr><td>FT-FM2</td><td></td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>2,500</td><td>1,300</td><td>1,000</td></tr><tr><td>FT-T80</td><td></td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>2,500</td><td>1,300</td><td>1,000</td></tr><tr><td>FT-R80</td><td></td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>2,300</td><td>1,600</td><td>800</td><td>750</td></tr><tr><td>FT-W8</td><td></td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>2,900</td><td>2,000</td><td>1,000</td><td>900</td></tr><tr><td>FT-P80</td><td></td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>2,500</td><td>1,100</td><td>1,000</td></tr><tr><td>FT-P60</td><td></td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>1,500</td><td>900</td><td>800</td></tr><tr><td>FT-P81X</td><td></td><td>1,600 (Note 2)</td><td>1,600 (Note 2)</td><td>1,600 (Note 2)</td><td>1,600 (Note 2)</td><td>1,600 (Note 2)</td><td>1,100</td><td>950</td></tr><tr><td>FT-H35-M2</td><td></td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>2,500</td><td>2,000</td><td>1,500</td><td>750</td><td>700</td></tr><tr><td>FT-H20W-M1</td><td></td><td>1,600 (Note 2)</td><td>1,600 (Note 2)</td><td>1,600 (Note 2)</td><td>1,300</td><td>900</td><td>500</td><td>400</td></tr><tr><td>FT-H20-M1</td><td></td><td>1,600 (Note 2)</td><td>1,600 (Note 2)</td><td>1,600 (Note 2)</td><td>1,600 (Note 2)</td><td>1,100</td><td>900</td><td>600</td></tr></table>	Fiber	Mode	U-LG	LONG	STDF	STD	FAST	S-D	H-SP	FT-B8		3,500 (Note 2)	3,500 (Note 2)	3,000	2,500	2,000	1,000	1,000	FT-FM2		3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	2,500	1,300	1,000	FT-T80		3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	2,500	1,300	1,000	FT-R80		3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	2,300	1,600	800	750	FT-W8		3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	2,900	2,000	1,000	900	FT-P80		3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	2,500	1,100	1,000	FT-P60		3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	1,500	900	800	FT-P81X		1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,100	950	FT-H35-M2		3,500 (Note 2)	3,500 (Note 2)	2,500	2,000	1,500	750	700	FT-H20W-M1		1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,300	900	500	400	FT-H20-M1		1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)
Fiber	Mode	U-LG	LONG	STDF	STD	FAST	S-D	H-SP																																																																																																				
FT-B8		3,500 (Note 2)	3,500 (Note 2)	3,000	2,500	2,000	1,000	1,000																																																																																																				
FT-FM2		3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	2,500	1,300	1,000																																																																																																				
FT-T80		3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	2,500	1,300	1,000																																																																																																				
FT-R80		3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	2,300	1,600	800	750																																																																																																				
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FT-P60		3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	1,500	900	800																																																																																																				
FT-P81X		1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,100	950																																																																																																				
FT-H35-M2		3,500 (Note 2)	3,500 (Note 2)	2,500	2,000	1,500	750	700																																																																																																				
FT-H20W-M1		1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,300	900	500	400																																																																																																				
FT-H20-M1		1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,100	900	600																																																																																																				
Super-expansion lens (Note 1)	FX-LE2		Tremendously increases the sensing range with large diameter lenses.  • Ambient temperature: -60 to +350 °C -76 to +662 °F (Note 5)	Sensing range for FX-300 red LED type (mm) [Lens on both sides] (Note 3)																																																																																																								
				<table><tr><th>Fiber</th><th>Mode</th><th>U-LG</th><th>LONG</th><th>STDF</th><th>STD</th><th>FAST</th><th>S-D</th><th>H-SP</th></tr><tr><td>FT-B8</td><td></td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td></tr><tr><td>FT-FM2</td><td></td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td></tr><tr><td>FT-R80</td><td></td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td></tr><tr><td>FT-W8</td><td></td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td></tr><tr><td>FT-P80</td><td></td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td></tr><tr><td>FT-P60</td><td></td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td></tr><tr><td>FT-P81X</td><td></td><td>1,600 (Note 2)</td><td>1,600 (Note 2)</td><td>1,600 (Note 2)</td><td>1,600 (Note 2)</td><td>1,600 (Note 2)</td><td>1,600 (Note 2)</td><td>1,600 (Note 2)</td></tr><tr><td>FT-H35-M2</td><td></td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td></tr><tr><td>FT-H20W-M1</td><td></td><td>1,600 (Note 2)</td><td>1,600 (Note 2)</td><td>1,600 (Note 2)</td><td>1,600 (Note 2)</td><td>1,600 (Note 2)</td><td>1,500</td><td>1,600 (Note 2)</td></tr><tr><td>FT-H20-M1</td><td></td><td>1,600 (Note 2)</td><td>1,600 (Note 2)</td><td>1,600 (Note 2)</td><td>1,600 (Note 2)</td><td>1,600 (Note 2)</td><td>1,600 (Note 2)</td><td>1,600 (Note 2)</td></tr><tr><td>FT-H13-FM2</td><td></td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td><td>3,500 (Note 2)</td></tr></table>	Fiber	Mode	U-LG	LONG	STDF	STD	FAST	S-D	H-SP	FT-B8		3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	FT-FM2		3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	FT-R80		3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	FT-W8		3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	FT-P80		3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	FT-P60		3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	FT-P81X		1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	FT-H35-M2		3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	FT-H20W-M1		1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,500	1,600 (Note 2)	FT-H20-M1		1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	FT-H13-FM2		3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)
Fiber	Mode	U-LG	LONG	STDF	STD	FAST	S-D	H-SP																																																																																																				
FT-B8		3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)																																																																																																				
FT-FM2		3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)																																																																																																				
FT-R80		3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)																																																																																																				
FT-W8		3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)																																																																																																				
FT-P80		3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)																																																																																																				
FT-P60		3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)																																																																																																				
FT-P81X		1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)																																																																																																				
FT-H35-M2		3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)																																																																																																				
FT-H20W-M1		1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,500	1,600 (Note 2)																																																																																																				
FT-H20-M1		1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)	1,600 (Note 2)																																																																																																				
FT-H13-FM2		3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)	3,500 (Note 2)																																																																																																				
Side-view lens	FX-SV1		Beam axis is bent by 90°.  • Ambient temperature: -60 to +300 °C -76 to +572 °F (Note 5)	Sensing range for FX-300 red LED type (mm) [Lens on both sides] (Note 3)																																																																																																								
				<table><tr><th>Fiber</th><th>Mode</th><th>U-LG</th><th>LONG</th><th>STDF</th><th>STD</th><th>FAST</th><th>S-D</th><th>H-SP</th></tr><tr><td>FT-B8</td><td></td><td>1,450</td><td>1,100</td><td>660</td><td>530</td><td>400</td><td>186</td><td>180</td></tr><tr><td>FT-FM2</td><td></td><td>1,800</td><td>1,200</td><td>810</td><td>600</td><td>440</td><td>210</td><td>210</td></tr><tr><td>FT-T80</td><td></td><td>1,800</td><td>1,200</td><td>810</td><td>600</td><td>440</td><td>210</td><td>210</td></tr><tr><td>FT-W8</td><td></td><td>1,300</td><td>900</td><td>600</td><td>450</td><td>330</td><td>160</td><td>160</td></tr><tr><td>FT-P80</td><td></td><td>1,800</td><td>1,200</td><td>810</td><td>600</td><td>440</td><td>210</td><td>210</td></tr><tr><td>FT-P60</td><td></td><td>850</td><td>650</td><td>400</td><td>300</td><td>200</td><td>130</td><td>120</td></tr><tr><td>FT-P81X</td><td></td><td>1,800</td><td>1,200</td><td>810</td><td>600</td><td>440</td><td>200</td><td>200</td></tr><tr><td>FT-H35-M2</td><td></td><td>840</td><td>550</td><td>370</td><td>280</td><td>200</td><td>90</td><td>90</td></tr><tr><td>FT-H20W-M1</td><td></td><td>400</td><td>310</td><td>180</td><td>140</td><td>100</td><td>50</td><td>50</td></tr><tr><td>FT-H20-M1</td><td></td><td>840</td><td>550</td><td>370</td><td>280</td><td>200</td><td>90</td><td>90</td></tr></table>	Fiber	Mode	U-LG	LONG	STDF	STD	FAST	S-D	H-SP	FT-B8		1,450	1,100	660	530	400	186	180	FT-FM2		1,800	1,200	810	600	440	210	210	FT-T80		1,800	1,200	810	600	440	210	210	FT-W8		1,300	900	600	450	330	160	160	FT-P80		1,800	1,200	810	600	440	210	210	FT-P60		850	650	400	300	200	130	120	FT-P81X		1,800	1,200	810	600	440	200	200	FT-H35-M2		840	550	370	280	200	90	90	FT-H20W-M1		400	310	180	140	100	50	50	FT-H20-M1		840	550	370	280	200	90	90					
Fiber	Mode	U-LG	LONG	STDF	STD	FAST	S-D	H-SP																																																																																																				
FT-B8		1,450	1,100	660	530	400	186	180																																																																																																				
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FT-P60		850	650	400	300	200	130	120																																																																																																				
FT-P81X		1,800	1,200	810	600	440	200	200																																																																																																				
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FT-H20W-M1		400	310	180	140	100	50	50																																																																																																				
FT-H20-M1		840	550	370	280	200	90	90																																																																																																				
Expansion lens for vacuum fiber (Note 1)	FV-LE1		Sensing range increases by 4 times or more. • Ambient temperature: -60 to +350 °C -76 to +662 °F (Note 5)	Sensing range for FX-300 red LED type (mm) [Lens on both sides] (Note 3, 4)																																																																																																								
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Fiber	Mode	U-LG	LONG	STDF	STD	FAST	S-D	H-SP																																																																																																				
FT-H30-M1V		1,600	1,200	650	450	300	150	200																																																																																																				
Vacuum resistant side-view lens (Note 1)	FV-SV2		Beam axis is bent by 90°. • Ambient temperature: -60 to +300 °C -76 to +572 °F (Note 5)	Sensing range for FX-300 red LED type (mm) [Lens on both sides] (Note 3, 4)																																																																																																								
				<table><tr><th>Fiber</th><th>Mode</th><th>U-LG</th><th>LONG</th><th>STDF</th><th>STD</th><th>FAST</th><th>S-D</th><th>H-SP</th></tr><tr><td>FT-H30-M1V</td><td></td><td>1,600</td><td>1,200</td><td>650</td><td>450</td><td>300</td><td>150</td><td>200</td></tr></table>	Fiber	Mode	U-LG	LONG	STDF	STD	FAST	S-D	H-SP	FT-H30-M1V		1,600	1,200	650	450	300	150	200																																																																																						
Fiber	Mode	U-LG	LONG	STDF	STD	FAST	S-D	H-SP																																																																																																				
FT-H30-M1V		1,600	1,200	650	450	300	150	200																																																																																																				

- Notes: 1) Be careful when installing the thru-beam type fiber equipped with the expansion lens, as the beam envelope becomes narrow and alignment is difficult. Especially when installing a fiber with many cores (sharp bending fibers and heat-resistant glass fiber), please be sure to use it only after you have adjusted it sufficiently.
- 2) The fiber cable length practically limits the sensing range to 3,500 mm **137.795 in** long (FT-H20W-M1, FT-P81X and FT-H20-M1: 1,600 mm **62.992 in**).
- 3) The sensing ranges are the values for **FX-300** series red LED type amplifier. Please contact our office for details on sensing ranges for other types of amplifiers.
- 4) The fiber cable length for the **FT-H30-M1V** is 1 m **3.281 ft**. The sensing ranges in U-LG and LONG modes take into account the length of the **FT-J8** atmospheric side fiber.
- 5) Refer to p.101~ for the ambient temperatures of fibers to be used in combination.

FIBER SENSORS

LASER SENSORS

PHOTO-ELECTRIC SENSORS

MICRO PHOTO-ELECTRIC SENSORS

AREA SENSORS

SAFETY COMPONENTS

PRESSURE SENSORS

INDUCTIVE PROXIMITY SENSORS

PARTICULAR USE SENSORS

SENSOR OPTIONS

WIRE- SAVING SYSTEMS

MEASURE- MENT SENSORS

STATIC CONTROL DEVICES

LASER MARKERS

Selection Guide

Fibers

FT / FD / FR

Fiber Sensor Amplifiers

FX-100

FX-300

FX-410

FX-311

FX-11A


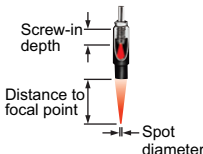
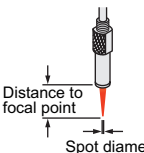
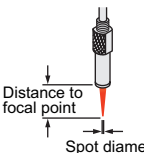
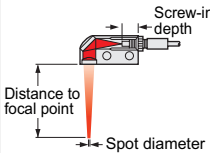
FX-301-F

Other Products

## FIBER OPTIONS

### Lens (For reflective type fiber)

The dimensions are on p.121~.

Designation		Model No.	Description															
For reflective type fiber	Pinpoint spot lens	FX-MR1		<p>Pinpoint spot of <math>\phi 0.5</math> mm <math>\phi 0.020</math> in. Enables detection of minute objects or small marks.</p> <ul style="list-style-type: none"><li>Distance to focal point: <math>6 \pm 1</math> mm <math>0.236 \pm 0.039</math> in</li><li>Applicable fibers: <b>FD-WG4, FD-G4</b></li><li>Ambient temperature: <math>-40</math> to <math>+70</math> °C <math>-40</math> to <math>+158</math> °F (Note 1)</li></ul>														
	Zoom lens	FX-MR2		<p>The spot diameter is adjustable from <math>\phi 0.7</math> to <math>\phi 2</math> mm <math>\phi 0.028</math> to <math>\phi 0.079</math> in according to how much the fiber is screwed in.</p> <ul style="list-style-type: none"><li>Applicable fibers: <b>FD-WG4, FD-G4</b></li><li>Ambient temperature: <math>-40</math> to <math>+70</math> °C <math>-40</math> to <math>+158</math> °F (Note 1)</li><li>Accessory: <b>MS-EX-3</b> (mounting bracket)</li></ul> <p><b>Sensing range for red LED type (Note 2)</b></p> <table><tr><th>Screw-in depth</th><th>Distance to focal point</th><th>Spot diameter</th></tr><tr><td>7mm</td><td>18.5 mm approx.</td><td><math>\phi 0.7</math> mm</td></tr><tr><td>12mm</td><td>27 mm approx.</td><td><math>\phi 1.2</math> mm</td></tr><tr><td>14mm</td><td>43 mm approx.</td><td><math>\phi 2.0</math> mm</td></tr></table>	Screw-in depth	Distance to focal point	Spot diameter	7mm	18.5 mm approx.	$\phi 0.7$ mm	12mm	27 mm approx.	$\phi 1.2$ mm	14mm	43 mm approx.	$\phi 2.0$ mm		
	Screw-in depth	Distance to focal point	Spot diameter															
	7mm	18.5 mm approx.	$\phi 0.7$ mm															
	12mm	27 mm approx.	$\phi 1.2$ mm															
14mm	43 mm approx.	$\phi 2.0$ mm																
Finest spot lens	FX-MR3		<p>Extremely fine spot of <math>\phi 0.3</math> mm <math>\phi 0.012</math> in approx. achieved.</p> <ul style="list-style-type: none"><li>Applicable fibers: <b>FD-WG4, FD-G4, FD-EG1, FD-EG2, FD-EG3, FD-G6X, FD-G6</b></li><li>Ambient temperature: <math>-40</math> to <math>+70</math> °C <math>-40</math> to <math>+158</math> °F (Note 1)</li></ul> <p><b>Sensing range for red LED type (Note 2)</b></p> <table><tr><th>Fiber model No.</th><th>Distance to focal point</th><th>Spot diameter</th></tr><tr><td><b>FD-EG3</b></td><td><math>7.5 \pm 0.5</math> mm</td><td><math>\phi 0.15</math> mm approx.</td></tr><tr><td><b>FD-EG2</b></td><td><math>7.5 \pm 0.5</math> mm</td><td><math>\phi 0.2</math> mm approx.</td></tr><tr><td><b>FD-EG1</b></td><td><math>7.5 \pm 0.5</math> mm</td><td><math>\phi 0.3</math> mm approx.</td></tr><tr><td><b>FD-WG4/G4/G6X/G6</b></td><td><math>7.5 \pm 0.5</math> mm</td><td><math>\phi 0.5</math> mm approx.</td></tr></table>	Fiber model No.	Distance to focal point	Spot diameter	<b>FD-EG3</b>	$7.5 \pm 0.5$ mm	$\phi 0.15$ mm approx.	<b>FD-EG2</b>	$7.5 \pm 0.5$ mm	$\phi 0.2$ mm approx.	<b>FD-EG1</b>	$7.5 \pm 0.5$ mm	$\phi 0.3$ mm approx.	<b>FD-WG4/G4/G6X/G6</b>	$7.5 \pm 0.5$ mm	$\phi 0.5$ mm approx.
Fiber model No.	Distance to focal point	Spot diameter																
<b>FD-EG3</b>	$7.5 \pm 0.5$ mm	$\phi 0.15$ mm approx.																
<b>FD-EG2</b>	$7.5 \pm 0.5$ mm	$\phi 0.2$ mm approx.																
<b>FD-EG1</b>	$7.5 \pm 0.5$ mm	$\phi 0.3$ mm approx.																
<b>FD-WG4/G4/G6X/G6</b>	$7.5 \pm 0.5$ mm	$\phi 0.5$ mm approx.																
Finest spot lens	FX-MR6		<p>Extremely fine spot of <math>\phi 0.1</math> mm <math>\phi 0.004</math> in approx. achieved.</p> <ul style="list-style-type: none"><li>Applicable fibers: <b>FD-WG4, FD-G4, FD-EG1, FD-EG2, FD-EG3, FD-G6X, FD-G6</b></li><li>Ambient temperature: <math>-20</math> to <math>+60</math> °C <math>-4</math> to <math>+140</math> °F (Note 1)</li></ul> <p><b>Sensing range for red LED type (Note 2)</b></p> <table><tr><th>Fiber model No.</th><th>Distance to focal point</th><th>Spot diameter</th></tr><tr><td><b>FD-EG3</b></td><td><math>7 \pm 0.5</math> mm</td><td><math>\phi 0.1</math> mm approx.</td></tr><tr><td><b>FD-EG2</b></td><td><math>7 \pm 0.5</math> mm</td><td><math>\phi 0.15</math> mm approx.</td></tr><tr><td><b>FD-EG1</b></td><td><math>7 \pm 0.5</math> mm</td><td><math>\phi 0.2</math> mm approx.</td></tr><tr><td><b>FD-WG4/G4/G6X/G6</b></td><td><math>7 \pm 0.5</math> mm</td><td><math>\phi 0.4</math> mm approx.</td></tr></table>	Fiber model No.	Distance to focal point	Spot diameter	<b>FD-EG3</b>	$7 \pm 0.5$ mm	$\phi 0.1$ mm approx.	<b>FD-EG2</b>	$7 \pm 0.5$ mm	$\phi 0.15$ mm approx.	<b>FD-EG1</b>	$7 \pm 0.5$ mm	$\phi 0.2$ mm approx.	<b>FD-WG4/G4/G6X/G6</b>	$7 \pm 0.5$ mm	$\phi 0.4$ mm approx.
Fiber model No.	Distance to focal point	Spot diameter																
<b>FD-EG3</b>	$7 \pm 0.5$ mm	$\phi 0.1$ mm approx.																
<b>FD-EG2</b>	$7 \pm 0.5$ mm	$\phi 0.15$ mm approx.																
<b>FD-EG1</b>	$7 \pm 0.5$ mm	$\phi 0.2$ mm approx.																
<b>FD-WG4/G4/G6X/G6</b>	$7 \pm 0.5$ mm	$\phi 0.4$ mm approx.																
Zoom lens (side-view type)	FX-MR5		<p><b>FX-MR2</b> is converted into a side-view type and can be mounted in a very small space.</p> <ul style="list-style-type: none"><li>Applicable fibers: <b>FD-WG4, FD-G4</b></li><li>Ambient temperature: <math>-40</math> to <math>+70</math> °C <math>-40</math> to <math>+158</math> °F (Note 1)</li></ul> <p><b>Sensing range for red LED type (Note 2)</b></p> <table><tr><th>Screw-in depth</th><th>Distance to focal point</th><th>Spot diameter</th></tr><tr><td>8 mm</td><td>13 mm approx.</td><td><math>\phi 0.5</math> mm</td></tr><tr><td>10 mm</td><td>15 mm approx.</td><td><math>\phi 0.8</math> mm</td></tr><tr><td>14 mm</td><td>30 mm approx.</td><td><math>\phi 3.0</math> mm</td></tr></table>	Screw-in depth	Distance to focal point	Spot diameter	8 mm	13 mm approx.	$\phi 0.5$ mm	10 mm	15 mm approx.	$\phi 0.8$ mm	14 mm	30 mm approx.	$\phi 3.0$ mm			
Screw-in depth	Distance to focal point	Spot diameter																
8 mm	13 mm approx.	$\phi 0.5$ mm																
10 mm	15 mm approx.	$\phi 0.8$ mm																
14 mm	30 mm approx.	$\phi 3.0$ mm																

Notes: 1) Refer to p.101~ for the ambient temperatures of fibers to be used in combination.

2) The sensing ranges are the values when used in combination with **FX-300** series red LED type amplifier. Please contact our office for details on sensing ranges for other types of amplifier.

Selection Guide

Fibers

FT / FD / FR

Fiber Sensor Amplifiers

**FX-100**

**FX-300**

**FX-410**

**FX-311**

**FX-11A**

**FX-301-F**

Other Products

## FIBER OPTIONS

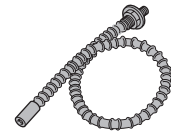
## Others

Designation	Model No.	Description				
Protective tube (For thru-beam type fiber)	FTP-500 (0.5 m 1.640 ft)	For M4 thread	Applicable fibers	FT-B8 FT-FM2 FT-FM2S FT-H13-FM2	FT-P80 FT-P60 FT-FM2S4	The protective tube, made of non-corrosive stainless steel, protects the inner fiber cable from any external forces.
	FTP-1000 (1 m 3.281 ft)					
	FTP-1500 (1.5 m 4.921 ft)					
	FTP-N500 (0.5 m 1.640 ft)	For M3 thread		FT-T80 FT-NFM2 FT-NFM2S FT-NFM2S4	FT-P40 FD-T40 FD-P40	
	FTP-N1000 (1 m 3.281 ft)					
	FTP-N1500 (1.5 m 4.921 ft)					
Protective tube (For reflective type fiber)	FDP-500 (0.5 m 1.640 ft)	For M6 thread		FD-B8 FD-FM2 FD-FM2S FD-FM2S4	FD-P80 FD-H13-FM2	
	FDP-1000 (1 m 3.281 ft)					
	FDP-1500 (1.5 m 4.921 ft)					
	FDP-N500 (0.5 m 1.640 ft)	For M4 thread		FD-T80 FD-NFM2 FD-NFM2S FD-NFM2S4		
	FDP-N1000 (1 m 3.281 ft)					
	FDP-N1500 (1.5 m 4.921 ft)					
Fiber bender	FB-1	The fiber bender bends the sleeve part of the fiber head at the proper radius. (Note 1)				
Universal sensor mounting stand (Note 2)	MS-AJ1-F	Horizontal mounting type	Mounting stand assembly for fiber (For M3, M4 or M6 threaded head fiber)			
	MS-AJ2-F	Vertical mounting type				
Fiber cutter	FX-CT2	The free-cut type fiber can be easily cut. [ Accessory. FX-CT1 is attached with the FT-P80 or the FD-P80. The FX-CT2 is provided with fibers other than this. ]				
	FX-CT1					
Attachment for fixed-length fiber	FX-AT2	This is the attachment for the fixed length fiber. (Accessory)				
Attachment for ø2.2 mm ø0.087 in fiber	FX-AT3	This is the attachment for the ø2.2 mm ø0.087 in fiber. (Accessory. Does not attach with the FT-P80 or the FD-P80.)				
Attachment for ø1 mm ø0.039 in fiber	FX-AT4	This is the attachment for the ø1 mm ø0.039 in fiber. (Accessory)				
Attachment for ø1.3 mm ø0.051 in fiber	FX-AT5	This is the attachment for the ø1.3 mm ø0.051 in fiber. (Accessory)				
Attachment for ø1 mm ø0.039 in / ø1.3 mm ø0.051 in mixed fiber	FX-AT6	This is the attachment for the ø1 mm ø0.039 in / ø1.3 mm ø0.051 in mixed fiber. (Accessory)				

Notes: 1) Do not bend the sleeve part of any side-view type fiber or ultra-small diameter head type fiber.  
2) Refer to p.799 for details of the universal sensor mounting stand.

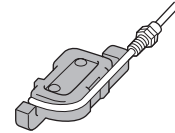
## Protective tube

- FTP-□
- FDP-□



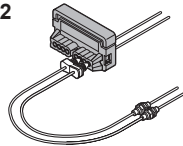
## Fiber bender

- FB-1

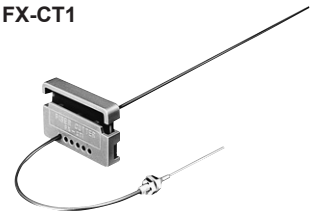


## Fiber cutter

- FX-CT2



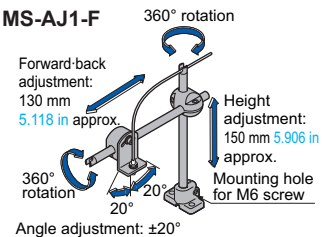
- FX-CT1



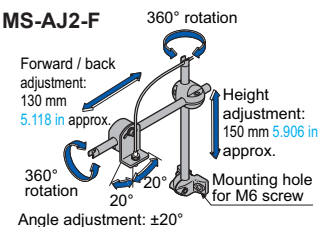
## Universal sensor mounting stand

Using the arm which enables adjustment in the horizontal direction, sensing can also be done from above an assembly line.

- MS-AJ1-F



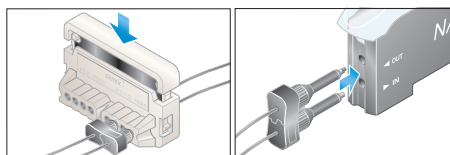
- MS-AJ2-F



## Fiber attachment

It's possible to simultaneously cut two fibers to the same length

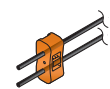
Each fiber (with some exceptions) has a newly developed two-in-one fiber attachment (FX-AT3/AT4/AT5/AT6) which enables two fibers to be cut simultaneously to the same length with the new fiber cutter (FX-CT2). Also, since the fibers can be attached to the amplifier while being fixed in position in the two-in-one fiber attachment, sensitivity changes resulting from variation in the amount of fiber insertion do not occur.



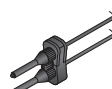
- FX-AT2  
(for fixed-length fiber)



- FX-AT3  
(for ø2.2 mm ø0.087 in fiber)



- FX-AT4  
(for ø1 mm ø0.039 in fiber)



- FX-AT5  
(for ø1.3 mm ø0.051 in fiber)



- FX-AT6  
(for ø1 mm ø0.039 in / ø1.3 mm ø0.051 in mixed fiber)



## FIBER SENSORS

## LASER SENSORS

## PHOTO-ELECTRIC SENSORS

## MICRO PHOTO-ELECTRIC SENSORS

## AREA SENSORS

## SAFETY COMPONENTS

## PRESSURE SENSORS

## INDUCTIVE PROXIMITY SENSORS

## PARTICULAR USE SENSORS

## SENSOR OPTIONS

## WIRE- SAVING SYSTEMS

## MEASURE- MENT SENSORS

## STATIC CONTROL DEVICES

## LASER MARKERS

## Selection Guide

## Fibers

## FT / FD / FR

## Fiber Sensor Amplifiers

## FX-100

## FX-300

## FX-410

## FX-311

## FX-11A

## FX-301-F

## Other Products