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**FX-301 / FX-305 (Red LED type) sensing range (Note 1)**

**Thru-beam type (one pair set)**



The **FX-305** and **FX-301(-HS)** have different sensing modes.  
**FX-305:** H-SP, FAST, STD, STDF, LONG, U-LG (no S-D mode)  
**FX-301(-HS):** S-D, H-SP (Note 1), FAST, STD, LONG (no STDF or U-LG mode)

Fibers are listed in alphabetic order. Refer to p.5~ "Fiber Selection" for details of each fiber.

Model No.	Sensing range (mm in) (Note 2)								Dimensions
	Red LED								
	U-LG	LONG	STDF	STD	FAST	H-SP	S-D		
<b>FT-140</b>	19,600 771.654 (Note 3)	19,600 771.654 (Note 3)	19,600 771.654 (Note 3)	16,000 629.921	16,000 629.921	8,700 342.520	8,700 342.520	P.51	
<b>FT-30</b>	450 17.717	310 12.205	210 8.268	150 5.906	110 4.331	60 2.362	60 2.362	P.51	
<b>FT-31</b>	440 17.323	290 11.417	200 7.874	142 5.591	105 4.134	58 2.283	49 1.929	P.51	
<b>FT-31S</b>	440 17.323	290 11.417	200 7.874	140 5.512	100 3.937	55 2.165	49 1.929	P.51	
<b>FT-31W</b>	300 11.811	230 9.055	130 5.118	100 3.937	65 2.559	30 1.181	30 1.181	P.51	
<b>FT-40</b>	1,300 51.181	900 35.433	600 23.622	450 17.717	330 12.992	180 7.087	180 7.087	P.51	
<b>FT-42</b>	1,100 43.307	800 31.496	550 21.654	400 15.748	285 11.220	160 6.299	150 5.906	P.51	
<b>FT-42S</b>	1,100 43.307	800 31.496	550 21.654	400 15.748	285 11.220	160 6.299	150 5.906	P.51	
<b>FT-42W</b>	1,000 39.370	710 27.953	460 18.110	330 12.992	240 9.449	130 5.118	130 5.118	P.51	
<b>FT-43</b>	1,900 74.803	1,400 55.118	800 31.496	610 24.016	440 17.323	240 9.449	250 9.843	P.51	
<b>FT-45X</b>	1,600 62.992 (Note 3)	1,100 43.307	780 30.709	570 22.441	410 16.142	230 9.055	230 9.055	P.52	
<b>FT-A11</b>	3,600 141.732 (Note 3)	3,600 141.732 (Note 3)	3,600 141.732 (Note 3)	2,700 106.299	1,800 70.866	1,100 43.307	1,000 39.370	P.52	
<b>FT-A11W</b>	3,600 141.732 (Note 3)	3,600 141.732 (Note 3)	3,600 141.732 (Note 3)	3,100 122.047	2,300 90.551	1,200 47.244	1,200 47.244	P.52	
<b>FT-A32</b>	3,600 141.732 (Note 3)	3,600 141.732 (Note 3)	3,600 141.732 (Note 3)	3,600 141.732 (Note 3)	3,600 141.732 (Note 3)	2,900 114.173	2,900 114.173	P.52	
<b>FT-A32W</b>	3,600 141.732 (Note 3)	3,600 141.732 (Note 3)	3,600 141.732 (Note 3)	3,600 141.732 (Note 3)	3,600 141.732 (Note 3)	2,000 78.740	2,100 82.677	P.52	
<b>FT-AL05</b>	760 29.921	680 26.772	340 13.386	330 12.992	230 9.055	130 5.118	130 5.118	P.52	
<b>FT-E13</b>	20 0.787	13 0.512	9 0.354	6 0.236	5 0.197	2 0.079	2 0.079	P.52	
<b>FT-E23</b>	95 3.740	65 2.559	42 1.654	31 1.220	22 0.866	12 0.472	12 0.472	P.52	
<b>FT-H13-FM2</b>	1,200 47.244	880 34.646	550 21.654	440 17.323	300 11.811	150 5.906	155 6.102	P.52	
<b>FT-H20-J20-S (Note 4)</b>	530 20.866	390 15.354	225 8.858	200 7.874	140 5.512	60 2.362	60 2.362	P.53	
<b>FT-H20-J30-S (Note 4)</b>	530 20.866	390 15.354	225 8.858	200 7.874	140 5.512	60 2.362	60 2.362	P.53	
<b>FT-H20-J50-S (Note 4)</b>	530 20.866	390 15.354	225 8.858	200 7.874	140 5.512	60 2.362	60 2.362	P.53	
<b>FT-H20-M1</b>	750 29.528	550 21.654	320 12.598	280 11.024	200 7.874	85 3.346	90 3.543	P.53	
<b>FT-H20-VJ50-S (Note 4)</b>	840 33.071	550 21.654	370 14.567	280 11.024	200 7.874	90 3.543	90 3.543	P.53	
<b>FT-H20-VJ80-S (Note 4)</b>	840 33.071	550 21.654	370 14.567	280 11.024	200 7.874	90 3.543	90 3.543	P.53	
<b>FT-H20W-M1</b>	420 16.535	310 12.205	180 7.087	140 5.512	100 3.937	40 1.575	50 1.969	P.53	
<b>FT-H30-M1V-S (Note 5)</b>	350 13.78	250 9.843	150 5.906	125 4.921	90 3.543	50 1.969	40 1.575	P.53	
<b>FT-H35-M2</b>	750 29.528	550 21.654	330 12.992	280 11.024	200 7.874	85 3.346	90 3.543	P.53	
<b>FT-H35-M2S6</b>	750 29.528	550 21.654	330 12.992	280 11.024	200 7.874	85 3.346	90 3.543	P.53	
<b>FT-HL80Y</b>	3,500 137.795 (Note 3)	3,500 137.795 (Note 3)	1,800 70.866	1,350 53.150	900 35.433	450 17.717	480 18.898	P.53	
<b>FT-KS40</b>	3,600 141.732 (Note 3)	3,600 141.732 (Note 3)	3,600 141.732 (Note 3)	2,700 106.299	1,900 74.803	1,000 39.370	850 33.465	P.54	
<b>FT-KV26</b>	800 31.496	710 27.953	340 13.386	310 12.205	20 0.787	120 4.724	120 4.724	P.54	
<b>FT-KV40</b>	3,600 141.732 (Note 3)	3,600 141.732 (Note 3)	3,200 125.984	2,500 98.425	1,800 70.866	1,000 39.370	1,000 39.370	P.54	
<b>FT-KV40W</b>	3,600 141.732 (Note 3)	3,600 141.732 (Note 3)	3,200 125.984	2,000 78.740	1,400 55.118	790 31.102	810 31.890	P.54	
<b>FT-L80Y</b>	3,500 137.795	3,500 137.795	2,000 78.740	1,500 59.055	1,000 39.370	500 19.685	530 20.866	P.54	

- Notes: 1) Please contact our office about the sensing ranges for **FX-301-HS** in H-SP mode.  
 2) Note 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 fiber cable length practically limits the sensing range.  
 4) Heat-resistant joint fibers and ordinary-temperature fibers (**FT-42**) are sold as a set.  
 5) Sold as a set comprising vacuum type fiber + photo-terminal (**FV-BR1**) + fiber at atmospheric side (**FT-J8**).

**LIST OF FIBERS**

**FX-301 / FX-305 (Red LED type) sensing range (Note 1)**

**Thru-beam type (one pair set)** 

The **FX-305** and **FX-301(-HS)** have different sensing modes.  
**FX-305:** H-SP, FAST, STD, STDF, LONG, U-LG (no S-D mode)  
**FX-301(-HS):** S-D, H-SP (Note 1), FAST, STD, LONG (no STDF or U-LG mode)

Fibers are listed in alphabetic order. Refer to p.5~ "Fiber Selection" for details of each fiber.

Model No.	Sensing range (mm in) (Note 2)												Dimensions		
	Red LED														
	U-LG		LONG		STDF		STD		FAST		H-SP			S-D	
<b>FT-R31</b>	340	13.386	290	11.417	150	5.906	130	5.118	95	3.740	49	1.929	49	1.929	P.54
<b>FT-R40</b>	1,000	39.370	710	27.953	470	18.504	330	12.992	240	9.449	130	5.118	130	5.118	P.54
<b>FT-R41W</b>	1,000	39.370	710	27.953	460	18.110	330	12.992	240	9.449	130	5.118	130	5.118	P.54
<b>FT-R42W</b>	2,800	110.236	1,600	62.992	890	35.039	770	30.315	560	22.047	310	12.205	320	12.598	P.54
<b>FT-R43</b>	1,000	39.370	710	27.953	450	17.717	290	11.417	210	8.268	110	4.331	110	4.331	P.54
<b>FT-R44Y</b>	1,000	39.370	710	27.958	450	17.717	290	11.417	210	8.268	110	4.330	110	4.330	P.55
<b>FT-R60Y</b>	2,650	104.330	1,800	70.866	1,200	47.244	830	32.677	610	24.016	335	13.189	350	13.780	P.55
<b>FT-S11</b>	100	3.937	80	3.150	50	1.969	31	1.220	22	0.866	13	0.512	14	0.551	P.55
<b>FT-S20</b>	450	17.717	310	12.205	210	8.268	150	5.906	110	4.331	60	2.362	60	2.362	P.55
<b>FT-S21</b>	440	17.323	290	11.417	200	7.874	142	5.591	105	4.134	58	2.283	49	1.929	P.55
<b>FT-S21W</b>	300	11.811	230	9.055	130	5.118	100	3.937	65	2.559	30	1.181	30	1.181	P.55
<b>FT-S30</b>	1,300	51.181	900	35.433	600	23.622	450	17.717	330	12.992	180	7.087	180	7.087	P.55
<b>FT-S31W</b>	1,000	39.370	710	27.953	460	18.110	330	12.992	240	9.449	130	5.118	130	5.118	P.55
<b>FT-S32</b>	3,600	141.732	2,400	94.488	1,500	59.055	1,100	43.307	840	33.071	460	18.110	510	20.079	P.55
<b>FT-V23</b>	590	23.228	380	14.961	270	10.630	170	6.693	125	4.921	60	2.362	63	2.480	P.55
<b>FT-V24W</b>	120	4.724	90	3.543	55	2.165	40	1.575	30	1.181	13	0.512	15	0.591	P.56
<b>FT-V25</b>	310	12.205	200	7.874	130	5.118	90	3.543	60	2.362	35	1.378	35	1.378	P.56
<b>FT-V30</b>	620	24.409	420	16.535	270	10.630	200	7.874	140	5.512	70	2.756	70	2.756	P.56
<b>FT-V40</b>	3,600	141.732 (Note 3)	3,600	141.732 (Note 3)	1,600	62.992	1,700	66.929	1,200	47.244	680	26.772	690	27.165	P.56
<b>FT-V80Y</b>	1,000	39.370	800	31.496	500	19.685	400	15.748	280	11.024	120	4.724	140	5.512	P.56
<b>FT-Z20HBW</b>	400	15.748	290	11.417	160	6.299	130	5.118	90	3.543	50	1.969	50	1.969	P.56
<b>FT-Z20W</b>	830	32.677	570	22.441	370	14.567	250	9.843	180	7.087	90	3.543	90	3.543	P.56
<b>FT-Z30</b>	2,600	102.362	1,900	74.803	1,100	43.307	850	33.465	620	24.409	330	12.992	340	13.386	P.56
<b>FT-Z30E</b>	3,600	141.732 (Note 3)	3,100	122.047	2,100	82.677	1,600	62.992	1,100	43.307	650	25.591	670	26.378	P.56
<b>FT-Z30EW</b>	3,600	141.732 (Note 3)	2,700	106.299	1,400	55.118	1,200	47.244	900	35.433	500	19.685	500	19.685	P.57
<b>FT-Z30H</b>	3,600	141.732 (Note 3)	3,100	122.047	2,200	86.614	1,600	62.992	1,100	43.307	650	25.591	670	26.378	P.57
<b>FT-Z30HW</b>	3,600	141.732 (Note 3)	3,100	122.047	2,200	86.614	1,500	59.055	1,000	39.370	590	23.228	610	24.016	P.57
<b>FT-Z30W</b>	2,000	78.740	1,400	55.118	890	35.039	640	25.197	460	18.110	250	9.843	260	10.236	P.57
<b>FT-Z40HBW</b>	1,000	39.370	710	27.953	460	18.110	330	12.992	240	9.449	130	5.118	130	5.118	P.57
<b>FT-Z40W</b>	1,900	74.803	1,300	51.181	900	35.433	630	24.803	460	18.110	240	9.449	260	10.236	P.57
<b>FT-Z802Y</b>	3,500	137.795	3,500	137.795	3,000	118.110	1,500	59.055	1,000	39.370	500	19.685	530	20.866	P.57

- Notes: 1) Please contact our office about the sensing ranges for **FX-301-HS** in H-SP mode.  
 2) Note 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 fiber cable length practically limits the sensing range.

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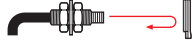
FA COMPONENTS

MACHINE VISION SYSTEMS

UV CURING SYSTEMS

**FX-301 / FX-305 (Red LED type) sensing range (Note 1)**

**Retroreflective type**



The **FX-305** and **FX-301(-HS)** have different sensing modes.  
**FX-305:** H-SP, FAST, STD, STDF, LONG, U-LG (no S-D mode)  
**FX-301(-HS):** S-D, H-SP (Note 1), FAST, STD, LONG (no STDF or U-LG mode)

Fibers are listed in alphabetic order. Refer to p.5~ "Fiber Selection" for details of each fiber.

Model No.	Sensing range (mm in) (Note 2, 3)								Dimensions
	Red LED								
	U-LG	LONG	STDF	STD	FAST	H-SP	S-D		
<b>FR-KZ22E</b>	15 to 370 <b>0.591 to 14.567</b>	15 to 330 <b>0.591 to 12.992</b>	15 to 240 <b>0.591 to 9.449</b>	15 to 210 <b>0.591 to 8.268</b>	15 to 170 <b>0.590 to 6.693</b>	15 to 80 <b>0.591 to 3.150</b>	15 to 90 <b>0.591 to 3.543</b>	P.58	
<b>FR-KZ50E</b>	20 to 350 <b>0.787 to 13.780</b>	20 to 300 <b>0.787 to 11.811</b>	20 to 250 <b>0.787 to 9.843</b>	20 to 200 <b>0.787 to 7.874</b>	20 to 200 <b>0.787 to 7.874</b>	20 to 200 <b>0.787 to 7.874</b>	20 to 200 <b>0.787 to 7.874</b>	P.58	
<b>FR-KZ50H</b>	20 to 350 <b>0.787 to 13.780</b>	20 to 300 <b>0.787 to 11.811</b>	20 to 250 <b>0.787 to 9.843</b>	20 to 200 <b>0.787 to 7.874</b>	20 to 200 <b>0.787 to 7.874</b>	20 to 200 <b>0.787 to 7.874</b>	20 to 200 <b>0.787 to 7.874</b>	P.58	
<b>FR-Z50HW</b>	100 to 920 <b>3.937 to 36.220</b>	100 to 810 <b>3.937 to 31.890</b>	100 to 660 <b>3.937 to 25.984</b>	100 to 580 <b>3.937 to 22.835</b>	100 to 490 <b>3.937 to 19.291</b>	100 to 340 <b>3.937 to 13.385</b>	100 to 270 <b>3.937 to 10.630</b>	P.58	

- Notes: 1) Please contact our office about the sensing ranges for **FX-301-HS** in H-SP mode.  
 2) Note that the sensing range of the free-cut type fiber may be reduced by 20 % max. depending upon how the fiber is cut.  
 The sensing range of **FR-KZ22E** is specified for the attached reflector. The sensing range of **FR-KZ50E** and **FR-KZ50H** is specified for the attached reflector **RF-003**. The sensing range of **FR-Z50HW** is specified for the **RF-13**.  
 3) The sensing range is the possible setting range for the attached reflector. The fiber can detect an object less than setting range for the reflector. However, note that if there are any white or highly-reflective surfaces near the fiber head, reflected incident light may affect the fiber head. If this occurs, adjust the threshold value of the amplifier unit before use.

**Sensing range when using in combination with FR-Z50HW reflector (Optional)**

The sensing ranges are the value for red LED types.

Reflector Model No.	Sensing range (mm in)								FX-301-HS
	FX-301 / 305								
	U-LG	LONG	STDF	STD	FAST	S-D	H-SP	H-SP	
<b>RF-230</b>	100 to 7,500 <b>3.937 to 295.276</b>	100 to 3,200 <b>3.937 to 125.984</b>	100 to 2,900 <b>3.937 to 114.173</b>	100 to 2,000 <b>3.937 to 78.740</b>	100 to 1,600 <b>3.937 to 62.992</b>	100 to 1,000 <b>3.937 to 39.370</b>	100 to 900 <b>3.937 to 35.433</b>	100 to 700 <b>3.937 to 27.559</b>	
<b>RF-220</b>	100 to 2,400 <b>3.937 to 94.488</b>	100 to 2,400 <b>3.937 to 94.488</b>	100 to 1,900 <b>3.937 to 74.803</b>	100 to 1,300 <b>3.937 to 51.181</b>	100 to 1,000 <b>3.937 to 39.370</b>	100 to 600 <b>3.937 to 23.622</b>	100 to 570 <b>3.937 to 22.441</b>	100 to 350 <b>3.937 to 13.780</b>	
<b>RF-210</b>	100 to 2,100 <b>3.937 to 82.677</b>	100 to 1,700 <b>3.937 to 66.929</b>	100 to 1,300 <b>3.937 to 51.181</b>	100 to 910 <b>3.937 to 35.827</b>	100 to 710 <b>3.937 to 27.953</b>	100 to 460 <b>3.937 to 18.110</b>	100 to 440 <b>3.937 to 17.323</b>	—————	

Note: The sensing range is the possible setting range for the reflector. The fiber can detect an object less than setting range for the reflector. However, note that if there are any white or highly-reflective surfaces near the fiber head, reflected incident light may affect the fiber head. If this occurs, adjust the threshold value of the amplifier unit before use.

**FX-301 / FX-305 (Red LED type) sensing range (Note 1)**

**Reflective type**



The **FX-305** and **FX-301(-HS)** have different sensing modes.  
**FX-305:** H-SP, FAST, STD, STDF, LONG, U-LG (no S-D mode)  
**FX-301(-HS):** S-D, H-SP (Note 1), FAST, STD, LONG (no STDF or U-LG mode)

Fibers are listed in alphabetic order. Refer to p.5~ "Fiber Selection" for details of each fiber.

Model No.	Sensing range (mm in) (Note 2, 3) / Description											Dimensions
	Red LED											
	U-LG	LONG	STDF	STD	FAST	H-SP	S-D					
<b>FD-30</b>	170 <b>6.693</b>	110 <b>4.331</b>	70 <b>2.756</b>	50 <b>1.969</b>	40 <b>1.575</b>	20 <b>0.787</b>	18 <b>0.709</b>				P.59	
<b>FD-31</b>	150 <b>5.906</b>	95 <b>3.740</b>	63 <b>2.480</b>	45 <b>1.772</b>	35 <b>1.378</b>	17 <b>0.669</b>	16 <b>0.630</b>				P.59	
<b>FD-31W</b>	60 <b>2.362</b>	40 <b>1.575</b>	30 <b>1.181</b>	20 <b>0.787</b>	15 <b>0.591</b>	8 <b>0.315</b>	10 <b>0.394</b>				P.59	
<b>FD-32G</b>	210 <b>8.268</b>	120 <b>4.724</b>	100 <b>3.937</b>	60 <b>2.362</b>	42 <b>1.654</b>	20 <b>0.787</b>	20 <b>0.787</b>				P.59	
<b>FX-500</b>	<b>FD-32GX</b>	240 <b>9.449</b>	140 <b>5.512</b>	100 <b>3.937</b>	70 <b>2.756</b>	50 <b>1.969</b>	25 <b>0.984</b>	25 <b>0.984</b>			P.59	
<b>FX-100</b>	<b>FD-40</b>	170 <b>6.693</b>	110 <b>4.331</b>	70 <b>2.756</b>	50 <b>1.969</b>	40 <b>1.575</b>	20 <b>0.787</b>	18 <b>0.709</b>			P.59	
<b>FX-300</b>	<b>FD-41</b>	150 <b>5.906</b>	95 <b>3.740</b>	63 <b>2.480</b>	45 <b>1.772</b>	35 <b>1.378</b>	17 <b>0.669</b>	16 <b>0.630</b>			P.59	
<b>FX-410</b>	<b>FD-41S</b>	150 <b>5.906</b>	95 <b>3.740</b>	63 <b>2.480</b>	45 <b>1.772</b>	35 <b>1.378</b>	17 <b>0.669</b>	16 <b>0.630</b>			P.59	
<b>FX-311</b>	<b>FD-41SW</b>	60 <b>2.362</b>	40 <b>1.575</b>	30 <b>1.181</b>	20 <b>0.787</b>	15 <b>0.591</b>	8 <b>0.315</b>	10 <b>0.394</b>			P.59	
<b>FX-301-F7/ FX-301-F</b>	<b>FD-41W</b>	300 <b>11.811</b>	220 <b>8.661</b>	140 <b>5.512</b>	95 <b>3.740</b>	70 <b>2.756</b>	35 <b>1.378</b>	40 <b>1.575</b>			P.59	
	<b>FD-42G</b>	210 <b>8.268</b>	120 <b>4.724</b>	100 <b>3.937</b>	60 <b>2.362</b>	42 <b>1.654</b>	20 <b>0.787</b>	20 <b>0.787</b>			P.60	
	<b>FD-42GW</b>	160 <b>6.299</b>	85 <b>3.346</b>	70 <b>2.756</b>	35 <b>1.378</b>	25 <b>0.984</b>	13 <b>0.512</b>	14 <b>0.551</b>			P.60	
	<b>FD-60</b>	500 <b>19.685</b>	350 <b>13.780</b>	240 <b>9.449</b>	160 <b>6.299</b>	130 <b>5.118</b>	70 <b>2.756</b>	70 <b>2.756</b>			P.60	
	<b>FD-61</b>	440 <b>17.323</b>	320 <b>12.598</b>	205 <b>8.071</b>	145 <b>5.709</b>	105 <b>4.134</b>	65 <b>2.559</b>	60 <b>2.362</b>			P.60	
	<b>FD-61G</b>	460 <b>18.110</b>	200 <b>7.874</b>	210 <b>8.268</b>	90 <b>3.543</b>	65 <b>2.559</b>	35 <b>1.378</b>	40 <b>1.575</b>			P.60	
	<b>FD-61S</b>	440 <b>17.323</b>	320 <b>12.598</b>	205 <b>8.071</b>	145 <b>5.709</b>	105 <b>4.134</b>	60 <b>2.362</b>	60 <b>2.362</b>			P.60	

- Notes: 1) Please contact our office about the sensing ranges for **FX-301-HS** in H-SP mode.  
 2) Note 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 is specified for white non-glossy paper.

**LIST OF FIBERS****FX-301 / FX-305 (Red LED type) sensing range (Note 1)****Reflective type**

The **FX-305** and **FX-301(-HS)** have different sensing modes.

**FX-305:** H-SP, FAST, STD, STDF, LONG, U-LG (no S-D mode)

**FX-301(-HS):** S-D, H-SP (Note 1), FAST, STD, LONG (no STDF or U-LG mode)

Fibers are listed in alphabetic order. Refer to p.5~ "Fiber Selection" for details of each fiber.

Model No.	Sensing range (mm in) (Note 2, 3) / Description										Dimensions
	Red LED										
	U-LG	LONG	STDF	STD	FAST	H-SP	S-D				
<b>FD-61W</b>	300 11.811	220 8.661	140 5.512	95 3.740	70 2.756	35 1.378	40 1.575				P.60
<b>FD-62</b>	690 27.165	480 18.898	310 12.205	220 8.661	160 6.299	85 3.346	90 3.543				P.60
<b>FD-64X</b>	270 10.630	200 7.874	100 3.937	85 3.346	60 2.362	35 1.378	35 1.378				P.61
<b>FD-A16</b>	230 9.055	200 7.874	150 5.906	150 5.906	100 3.937	45 1.772	50 1.969				P.61
<b>FD-AL11</b>	360 14.173	250 9.843	160 6.299	110 4.331	80 3.150	40 1.575	40 1.575				P.61
<b>FD-E13</b>	15 0.591	11 0.433	7 0.276	6 0.236	4 0.157	2 0.079	2 0.079				P.61
<b>FD-E23</b>	65 2.559	45 1.772	28 1.102	19 0.748	14 0.551	7 0.276	7 0.276				P.61
<b>FD-EG30</b>	60 2.362	45 1.772	25 0.984	19 0.748	14 0.551	7 0.276	7 0.276				P.61
<b>FD-EG30S</b>	60 2.362	45 1.772	25 0.984	19 0.748	14 0.551	7 0.276	7 0.276				P.62
<b>FD-EG31</b>	20 0.787	15 0.591	9 0.354	8 0.315	5 0.197	2.5 0.098	3 0.118				P.62
<b>FD-F4</b>	Applicable pipe diameter: Outer dia. $\phi 6$ to $\phi 26$ mm $\phi 0.236$ to $\phi 1.024$ in transparent pipe [PFA (fluorine resin) or equivalently transparent pipe, wall thickness 1 mm 0.039 in]										P.62
<b>FD-F41</b>	Applicable pipe diameter: Outer dia. $\phi 6$ to $\phi 26$ mm $\phi 0.236$ to $\phi 1.024$ in transparent pipe [PVC (vinyl chloride), fluorine resin, polycarbonate, acrylic, glass, wall thickness 1 to 3 mm 0.039 to 0.118 in]										P.62
<b>FD-F41Y</b>	$\phi 4$ mm $\phi 0.157$ in form Protective tube: fluorine resin, length 500 mm 19.685 in (cuttable) Liquid surface not contacted: Beam received, Liquid surface contacted: Beam interrupted										P.62
<b>FD-F8Y</b>											P.62
<b>FD-FA93</b>	Applicable pipe diameter: Outer dia. $\phi 8$ mm $\phi 0.315$ in or more transparent pipe (When used with the tying bands: $\phi 8$ to $\phi 80$ mm $\phi 0.315$ to $\phi 3.150$ in) [PFA (fluorine resin), including translucent] Liquid absent: Beam received, Liquid present: Beam interrupted										P.62
<b>FD-H13-FM2</b>	410 16.142	310 12.205	200 7.874	140 5.512	100 3.937	55 2.165	47 1.850				P.63
<b>FD-H18-L31</b>	0 to 20 0 to 0.787	0 to 15 0 to 0.591	0 to 10 0 to 0.394	0 to 10 0 to 0.394	1 to 8 0.039 to 0.315	Cannot use	2 to 6 0.079 to 0.236				P.63
<b>FD-H20-21</b>	300 11.811	270 10.630	150 5.906	140 5.512	100 3.937	35 1.378	47 1.850				P.63
<b>FD-H20-M1</b>	300 11.811	270 10.630	150 5.906	140 5.512	100 3.937	35 1.378	47 1.850				P.63
<b>FD-H25-L43 (Note 5)</b>	3 to 28 0.118 to 1.102	3 to 25 0.118 to 0.984	4 to 23 0.157 to 0.906	4 to 20 0.118 to 0.787	4 to 19 0.118 to 0.748	4 to 16 0.118 to 0.630	4 to 16 0.118 to 0.630				P.63
<b>FD-H25-L45 (Note 5)</b>	5 to 42 0.197 to 1.654	6 to 41 0.236 to 1.614	6 to 40 0.236 to 1.575	7 to 38 0.276 to 1.496							P.63
<b>FD-H30-KZ1V-S (Note 5,6)</b>	20 to 300 0.787 to 11.811	20 to 200 0.787 to 7.874	20 to 150 0.787 to 5.906	25 to 130 0.984 to 5.118	30 to 100 1.181 to 3.937	Cannot use	Cannot use				P.64
<b>FD-H30-L32</b>	0 to 20 0 to 0.787	0 to 15 0 to 0.591	0 to 10 0 to 0.394	0 to 10 0 to 0.394	1 to 8 0.039 to 0.315	Cannot use	2 to 6 0.079 to 0.236				P.64
<b>FD-H30-L32V-S (Note 5,6)</b>	0 to 11 0 to 0.433	0 to 8 0 to 0.315	1.5 to 6 0.059 to 0.236	1.5 to 5 0.059 to 0.197	2 to 4 0.079 to 0.157	Cannot use	Cannot use				P.64
<b>FD-H35-20S</b>	190 7.480	160 6.299	80 3.150	80 3.150	57 2.244	20 0.787	26 1.024				P.64
<b>FD-H35-M2</b>	300 11.811	270 10.630	150 5.906	140 5.512	100 3.937	35 1.378	47 1.850				P.64
<b>FD-H35-M2S6</b>	300 11.811	270 10.630	150 5.906	140 5.512	100 3.937	35 1.378	47 1.850				P.64
<b>FD-HF40Y (Note 4)</b>	$\phi 4$ mm $\phi 0.157$ in form Protective tube: fluorine resin, length: 500 mm 19.685 in (allowable cutting) Liquid surface not contacted: Beam received, Liquid surface contacted: Beam interrupted										P.64
<b>FD-L10 (Note 5)</b>	0 to 4.7 0 to 0.185	0 to 4.5 0 to 0.177	0 to 4.5 0 to 0.177	0 to 4 0 to 0.157	0 to 3.8 0 to 0.150	0 to 3.5 0 to 0.138	0 to 3.5 0 to 0.138				P.65
<b>FD-L11 (Note 5)</b>	0 to 9 0 to 0.354	0 to 8 0 to 0.315	0 to 8 0 to 0.315	0 to 7 0 to 0.906	0 to 7 0 to 0.276	0 to 6 0 to 0.236	0 to 6 0 to 0.236				P.65
<b>FD-L12W (Note 5)</b>	0.5 to 9 0.020 to 0.354	0.5 to 8 0.019 to 0.315	1 to 6.5 0.039 to 0.256	1 to 5.5 0.039 to 0.217	1 to 5 0.039 to 0.197						P.65
<b>FD-L20H</b>	1 to 29 0.039 to 1.142	2 to 23 0.079 to 0.906	3 to 17 0.118 to 0.669	4 to 14 0.157 to 0.551	4.5 to 11 0.177 to 0.433	5 to 8.5 0.196 to 0.335	4.8 to 9.5 0.188 to 0.374				P.65
<b>FD-L21 (Note 5)</b>	2 to 19 0.079 to 0.748	2 to 18 0.079 to 0.709	2 to 16 0.079 to 0.748	3 to 16 0.118 to 0.630	3 to 15 0.118 to 0.591	4 to 11 0.157 to 0.433	5 to 11 0.197 to 0.433				P.65
<b>FD-L21W (Note 5)</b>	3 to 14.5 0.118 to 0.571	3 to 14 0.118 to 0.551	4 to 14 0.157 to 0.551	6 to 12 0.236 to 0.472	7 to 12 0.276 to 0.472						P.65
<b>FD-L22A (Note 5)</b>	0 to 26 0 to 1.024	0 to 23 0 to 0.906	0 to 23 0 to 0.906	0 to 23 0 to 0.906	0 to 19 0 to 0.748	1 to 17 0.039 to 0.669	1 to 17 0.039 to 0.669				P.65

Notes: 1) Please contact our office about the sensing ranges for **FX-301-HS** in H-SP mode.

2) Note 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 of reflective type is the value for white non-glossy paper (as for **FD-H30-L32** and **FD-H18-L31** 50 × 50 mm 1.969 × 1.969 in glass substrate).

4) Liquid inflow prevention joint, protective tube extension joint, fiber mounting joint are available. Please refer to p.38 for details.

5) The sensing range is specified for transparent glass 100 × 100 × 0.7 mm 3.937 × 3.937 × 0.028 in (**FD-L21** and **FD-L21W**: t2 mm 0.079 in) [**FD-L10**: silicon wafers 100 × 100 mm 3.937 × 3.937 in].

6) Sold as a set comprising vacuum type fiber + photo-terminal (**FV-BR1**) + fiber at atmospheric side (**FT-J8**).

FIBER

SENSORS

LASER

SENSORS

PHOTO-

ELECTRIC

SENSORS

MICRO

PHOTO-

ELECTRIC

SENSORS

AREA

SENSORS

LIGHT

CURTAINS /

SAFETY

COMPONENTS

PRESSURE /

FLOW

SENSORS

INDUCTIVE

PROXIMITY

SENSORS

PARTICULAR

USE

SENSORS

SENSOR

OPTIONS

SIMPLE

WIRE-SAVING

UNITS

WIRE-SAVING

SYSTEMS

MEASUREMENT

SENSORS

STATIC

ELECTRICITY

PREVENTION

DEVICES

LASER

MARKERS

PLC

HUMAN

MACHINE

INTERFACES

ENERGY

CONSUMPTION

VISUALIZATION

COMPONENTS

FA

COMPONENTS

MACHINE

VISION

SYSTEMS

UV

CURING

SYSTEMS

Selection

Guide

Fibers

Fiber

Amplifiers

**FX-500****FX-100****FX-300****FX-410****FX-311****FX-301-F7/****FX-301-F**

**LIST OF FIBERS**

**FX-301 / FX-305 (Red LED type) sensing range (Note 1)**

**Reflective type**



The **FX-305** and **FX-301(-HS)** have different sensing modes.  
**FX-305:** H-SP, FAST, STD, STDF, LONG, U-LG (no S-D mode)  
**FX-301(-HS):** S-D, H-SP (Note 1), FAST, STD, LONG (no STDF or U-LG mode)

Fibers are listed in alphabetic order. Refer to p.5~ "Fiber Selection" for details of each fiber.

Model No.	Sensing range (mm in) (Note 2, 3) / Description								Dimensions
	Red LED								
	U-LG	LONG	STDF	STD	FAST	H-SP	S-D		
<b>FD-L23</b> (Note 4)	0 to 30 0 to 1.181	0 to 30 0 to 1.181	0 to 30 0 to 1.181	0 to 30 0.039 to 1.181	1 to 28 0.039 to 1.102	2 to 27 0.079 to 1.063	2 to 27 0.079 to 1.063	P.65	
<b>FD-L30A</b> (Note 4)	0 to 50 0 to 1.969	0 to 43 0 to 17.441	0 to 40 0 to 1.575	0 to 37 0 to 1.457	0 to 32 0 to 1.260	0 to 26 0 to 1.024	0 to 26 0 to 1.024	P.65	
<b>FD-L31A</b> (Note 4)	4 to 33 0 to 13.110	4 to 33 0.157 to 1.299	5 to 32 0 to 1.260	5 to 32 0.197 to 1.260	5 to 32 0.197 to 1.259	6 to 18 0.236 to 0.709	6 to 18 0.236 to 0.709	P.65	
<b>FD-L32H</b> (Note 4)	0 to 60 0 to 2.362	0 to 50 0 to 1.969	0 to 36 0 to 0.984	15 to 35 0.591 to 1.378	16 to 29 0.630 to 1.142	—	—	P.66	
<b>FD-R31G</b>	160 6.299	92 3.622	75 2.953	44 1.732	32 1.260	17 0.669	17 0.669	P.66	
<b>FD-R32EG</b>	60 2.362	45 1.772	25 0.984	19 0.748	13 0.512	7 0.276	7 0.276	P.66	
<b>FD-R33EG</b>	17 0.669	15 0.591	8 0.315	6 0.236	4 0.157	2 0.079	2 0.079	P.66	
<b>FD-R34EG</b>	51 2.008	38 1.496	21 0.827	16 0.630	11 0.433	6 0.236	6 0.236	P.66	
<b>FD-R41</b>	230 9.055	150 5.906	100 3.937	70 2.756	50 1.969	28 1.102	28 1.102	P.66	
<b>FD-R60</b>	310 12.205	240 9.449	170 6.693	120 4.724	90 3.543	45 1.772	45 1.772	P.66	
<b>FD-R61Y</b>	350 13.780	230 9.055	160 6.299	110 4.330	80 3.150	45 1.772	45 1.772	P.66	
<b>FD-S21</b>	80 3.150	50 1.969	40 1.575	25 0.984	19 0.748	9 0.354	9 0.354	P.66	
<b>FD-S30</b>	170 6.693	110 4.331	70 2.756	50 1.969	40 1.575	20 0.787	18 0.709	P.67	
<b>FD-S31</b>	150 5.906	95 3.740	63 2.480	45 1.772	35 1.378	17 0.669	16 0.630	P.67	
<b>FD-S32</b>	440 17.323	270 10.630	200 7.874	140 5.512	100 3.937	55 2.165	55 2.165	P.67	
<b>FD-S32W</b>	300 11.811	220 8.661	140 5.512	95 3.740	70 2.756	35 1.378	40 1.575	P.67	
<b>FD-S33GW</b>	160 6.299	85 3.346	70 2.756	35 1.378	25 0.984	13 0.512	14 0.551	P.67	
<b>FD-S60Y</b>	410 16.142	360 14.173	250 9.843	170 6.693	120 4.724	65 2.559	70 2.756	P.67	
<b>FD-V30</b>	80 3.150	45 1.772	30 1.181	20 0.787	15 0.591	6 0.236	7 0.276	P.67	
<b>FD-V30W</b>	25 0.984	15 0.591	10 0.394	7 0.276	5 0.197	—	—	P.67	
<b>FD-V50</b>	170 6.693	100 3.937	55 2.165	45 1.772	32 1.260	15 0.591	16 0.630	P.68	
<b>FD-Z20HBW</b>	1 to 70 0.039 to 2.756	1 to 70 0.039 to 2.756	1 to 32.2 0.039 to 1.268	2 to 30 0.079 to 1.181	2.5 to 20 0.098 to 0.787	3 to 10 0.118 to 0.394	3 to 10 0.118 to 0.394	P.68	
<b>FD-Z20W</b>	1 to 87 0.039 to 3.425	1 to 59 0.09 to 2.323	2 to 39 0.079 to 1.535	3 to 27 0.118 to 1.063	3 to 19 0.118 to 0.748	—	—	P.68	
<b>FD-Z40HBW</b>	350 13.780	0.5 to 230 0.02 to 9.055	1 to 160 0.039 to 6.299	1 to 100 0.039 to 3.937	1 to 70 0.039 to 2.756	1 to 40 0.039 to 1.575	1 to 40 0.039 to 1.575	P.68	
<b>FD-Z40W</b>	270 10.630	180 7.087	120 4.724	1 to 87 0.039 to 3.425	1 to 63 0.039 to 2.480	2.5 to 32 0.098 to 1.260	2.5 to 32 0.098 to 1.260	P.68	
<b>FD-Z50HW</b>	10 to 870 0.394 to 34.252	10 to 540 0.394 to 21.260	10 to 400 0.394 to 15.748	10 to 250 0.393 to 9.843	10 to 190 0.394 to 7.480	15 to 100 0.196 to 3.937	15 to 100 0.591 to 3.937	P.68	

- Notes: 1) Please contact our office about the sensing ranges for **FX-301-HS** in H-SP mode.  
 2) Note 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 of reflective type is the value for white non-glossy paper.  
 4) The sensing range is specified for transparent glass 100 × 100 × t0.7 mm 3.937 × 3.937 × t0.028 in (**FD-L32H**: R edge).



**SENSING RANGE OF BLUE LED / GREEN LED / INFRARED LED**

**Thru-beam type (One pair set)** 

Fibers are listed in alphabetic order. Refer to p.5~ for details of each fiber.

Model No.	Sensing range (mm in) (Note 1)									Dimensions
	FX-301B / 311B			FX-301G / 311G			FX-301H (Note 2)			
	LONG	STD	FAST	LONG	STD	FAST	LONG	STD	FAST	
<b>FT-140</b>	8,100 318.898	4,000 157.480	3,100 122.047	5,000 196.850	2,400 94.488	1,600 62.992	3,700 145.669	2,000 78.740	1,400 55.118	P.51
<b>FT-30</b>	55 2.165	28 1.102	18 0.709	28 1.102	13 0.512	9 0.354	25 0.984	13 0.512	9 0.354	P.51
<b>FT-31</b>	50 1.969	25 0.984	16 0.630	24 0.945	12 0.472	8 0.315	23 0.906	11 0.433	8 0.315	P.51
<b>FT-31S</b>	50 1.969	25 0.984	16 0.630	24 0.945	12 0.472	8 0.315	23 0.906	11 0.433	8 0.315	P.51
<b>FT-31W</b>	31 1.220	15 0.591	10 0.394	15 0.591	8 0.315	5 0.197	18 0.709	8 0.315	5 0.197	P.51
<b>FT-40</b>	155 6.102	76 2.992	45 1.772	90 3.543	40 1.575	26 1.024	80 3.150	43 1.693	27 1.063	P.51
<b>FT-42</b>	150 5.906	75 2.953	40 1.575	80 3.150	35 1.378	24 0.945	75 2.953	40 1.575	25 0.984	P.51
<b>FT-42S</b>	150 5.906	75 2.953	40 1.575	70 2.756	35 1.378	24 0.945	75 2.953	40 1.575	25 0.984	P.51
<b>FT-42W</b>	110 4.331	50 1.969	30 1.181	56 2.205	28 1.102	20 0.787	64 2.520	32 1.260	21 0.827	P.51
<b>FT-43</b>	220 8.661	110 4.331	75 2.953	120 4.724	61 2.402	43 1.693	140 5.512	74 2.913	48 1.890	P.51
<b>FT-45X</b>	130 5.118	65 2.559	45 1.772	70 2.756	34 1.339	25 0.984	160 6.299	79 3.110	53 2.087	P.52
<b>FT-A11</b>	880 34.646	420 16.535	270 10.630	430 16.929	220 8.661	120 4.724	500 19.685	220 8.661	120 4.724	P.52
<b>FT-A11W</b>	820 32.283	420 16.535	280 11.024	460 18.110	220 8.661	140 5.512	520 20.472	240 9.449	140 5.512	P.52
<b>FT-A32</b>	1,800 70.866	710 27.953	400 15.748	970 38.189	320 12.598	180 7.087	910 35.827	340 13.386	150 5.906	P.52
<b>FT-A32W</b>	2,000 78.740	830 32.677	420 16.535	1,000 39.370	350 13.780	180 7.087	910 35.827	340 13.386	150 5.906	P.52
<b>FT-AL05</b>	100 3.937	48 1.890	32 1.260	56 2.205	27 1.063	18 0.709	54 2.126	27 1.063	18 0.709	P.52
<b>FT-E13</b>	2 0.079	1 0.039	—	1 0.039	—	—	2 0.079	1 0.039	—	P.52
<b>FT-E23</b>	8 0.315	4 0.157	3 0.118	4 0.157	2 0.079	1 0.039	10 0.394	5 0.197	3 0.118	P.52
<b>FT-H13-FM2</b>	72 2.835	36 1.417	26 1.024	32 1.260	16 0.630	10 0.394	70 2.756	35 1.378	25 0.984	P.52
<b>FT-H20-J20-S (Note 3)</b>	60 2.362	20 0.787	—	35 1.378	—	—	20 0.787	—	—	P.53
<b>FT-H20-J30-S (Note 3)</b>	60 2.362	20 0.787	—	35 1.378	—	—	20 0.787	—	—	P.53
<b>FT-H20-J50-S (Note 3)</b>	60 2.362	20 0.787	—	35 1.378	—	—	20 0.787	—	—	P.53
<b>FT-H20-M1</b>	100 3.937	50 1.969	35 1.378	50 1.969	25 0.984	18 0.709	550 21.654	280 11.024	160 6.299	P.53
<b>FT-H20-VJ50-S (Note 3)</b>	85 3.346	30 1.181	—	50 1.969	—	—	30 1.181	—	—	P.53
<b>FT-H20-VJ80-S (Note 3)</b>	85 3.346	30 1.181	—	50 1.969	—	—	30 1.181	—	—	P.53
<b>FT-H20W-M1</b>	44 1.732	22 0.866	14 0.551	22 0.866	11 0.433	7 0.276	220 8.661	100 3.937	70 2.756	P.53
<b>FT-H30-M1V-S (Note 4)</b>	40 1.575	20 0.787	—	20 0.787	—	—	20 0.787	—	—	P.53
<b>FT-H35-M2</b>	100 3.937	50 1.969	35 1.378	50 1.969	25 0.984	18 0.709	550 21.654	280 11.024	160 6.299	P.53
<b>FT-H35-M2S6</b>	100 3.937	50 1.969	35 1.378	50 1.969	25 0.984	18 0.709	550 21.654	280 11.024	160 6.299	P.53
<b>FT-HL80Y</b>	80 3.150	40 1.575	25 0.984	110 4.331	55 2.165	40 1.575	1,100 43.307	550 21.654	350 13.780	P.53
<b>FT-KS40</b>	740 29.134	280 11.024	220 8.661	420 16.535	180 7.087	81 3.189	460 18.110	190 7.480	95 3.740	P.54
<b>FT-KV26</b>	81 3.189	36 1.417	21 0.827	44 1.732	8 0.315	—	53 2.087	19 0.748	—	P.54
<b>FT-KV40</b>	710 27.953	270 10.630	210 8.268	420 16.535	180 7.087	100 3.937	290 11.417	120 4.724	53 2.087	P.54
<b>FT-KV40W</b>	860 33.858	400 15.748	260 10.236	420 16.535	210 8.268	140 5.512	490 19.291	240 9.449	140 5.512	P.54
<b>FT-L80Y</b>	160 6.299	80 3.150	50 1.969	160 6.299	80 3.150	50 1.969	400 15.748	200 7.874	150 5.906	P.54
<b>FT-R31</b>	45 1.772	23 0.906	15 0.591	24 0.945	12 0.472	8 0.315	23 0.906	11 0.433	8 0.315	P.54
<b>FT-R40</b>	110 4.331	54 2.126	36 1.417	55 2.165	26 1.024	20 0.787	58 2.283	30 1.181	20 0.787	P.54
<b>FT-R41W</b>	110 4.331	50 1.969	30 1.181	56 2.205	28 1.102	20 0.787	64 2.520	32 1.260	21 0.827	P.54
<b>FT-R42W</b>	280 11.024	130 5.118	90 3.543	140 5.512	70 2.756	47 1.850	140 5.512	70 2.756	47 1.850	P.54

Notes: 1) Note that the sensing range of the free-cut type fiber may be reduced by 20 % max. depending upon how the fiber is cut.  
 2) Because infrared types are easily affected by humidity, please ask assistance when using them in a humid environment or in an environment with varying humidity.  
 3) Heat-resistant joint fibers and ordinary-temperature fibers (FT-42) are sold as a set.  
 4) Sold as a set comprising vacuum type fiber + photo-terminal (FV-BR1) + fiber at atmospheric side (FT-J8).

FIBER SENSORS

LASER SENSORS

PHOTO-ELECTRIC SENSORS

MICRO PHOTO-ELECTRIC SENSORS

AREA SENSORS

LIGHT CURTAINS / SAFETY COMPONENTS

PRESSURE / FLOW SENSORS

INDUCTIVE PROXIMITY SENSORS

PARTICULAR USE SENSORS

SENSOR OPTIONS

SMILE WIRE-SAVING UNITS

WIRE-SAVING SYSTEMS

MEASUREMENT SENSORS

STATIC ELECTRICITY PREVENTION DEVICES

LASER MARKERS

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HUMAN MACHINE INTERFACES

ENERGY CONSUMPTION VISUALIZATION COMPONENTS

FA COMPONENTS

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Fibers

Fiber Amplifiers

**FX-500**

**FX-100**

**FX-300**

**FX-410**

**FX-311**

FX-301-F7/  
FX-301-F

**SENSING RANGE OF BLUE LED / GREEN LED / INFRARED LED**

FIBER SENSORS

LASER SENSORS

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MICRO PHOTO-ELECTRIC SENSORS

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Fibers

Fiber Amplifiers

FX-500

FX-100

FX-300

FX-410

FX-311

FX-301-F7 / FX-301-F

**Thru-beam type (One pair set)**



Fibers are listed in alphabetic order. Refer to p.5~ "Fiber Selection" for details of each fiber.

Model No.	Sensing range (mm in) (Note 1)									Dimensions
	FX-301B / 311B			FX-301G / 311G			FX-301H (Note 2)			
	LONG	STD	FAST	LONG	STD	FAST	LONG	STD	FAST	
<b>FT-R43</b>	96 3.780	50 1.969	33 1.299	53 2.087	25 0.984	17 0.669	55 2.165	27 1.063	18 0.709	P.54
<b>FT-R44Y</b>	96 3.780	50 1.969	33 1.299	53 2.087	25 0.984	17 0.669	55 5.165	27 1.063	18 0.709	P.55
<b>FT-R60Y</b>	250 9.843	120 4.724	80 3.150	140 5.512	70 2.756	50 1.969	60 2.362	90 3.543	170 6.693	P.55
<b>FT-S11</b>	12 0.472	5 0.197	4 0.157	5 0.197	2.5 0.098	1.5 0.059	21 0.827	10 0.394	7 0.276	P.55
<b>FT-S20</b>	55 2.165	28 1.102	18 0.709	28 1.102	13 0.512	9 0.354	25 0.984	13 0.512	9 0.354	P.55
<b>FT-S21</b>	50 1.969	25 0.984	16 0.630	24 0.945	12 0.472	8 0.315	23 0.906	11 0.433	8 0.315	P.55
<b>FT-S21W</b>	31 1.220	15 0.591	10 0.394	15 0.591	8 0.315	5 0.197	18 0.709	8 0.315	5 0.197	P.55
<b>FT-S30</b>	155 6.102	76 2.992	45 1.772	90 3.543	40 1.575	26 1.024	80 3.150	43 1.693	27 1.063	P.55
<b>FT-S31W</b>	110 4.331	50 1.969	30 1.181	56 2.205	28 1.102	20 0.787	64 2.520	32 1.260	21 0.827	P.55
<b>FT-S32</b>	420 16.535	200 7.874	130 5.118	220 8.661	100 3.937	72 2.835	210 8.268	100 3.937	67 2.638	P.55
<b>FT-V23</b>	65 2.559	26 1.024	18 0.709	26 1.024	13 0.512	8 0.315	29 1.142	13 0.512	9 0.354	P.55
<b>FT-V24W</b>	6 0.236	2 0.079	—	3 0.118	—	—	3 0.118	—	—	P.56
<b>FT-V25</b>	25 0.984	12 0.472	9 0.354	16 0.630	7 0.276	5 0.197	15 0.591	8 0.315	4 0.157	P.56
<b>FT-V30</b>	80 3.150	40 1.575	22 0.866	40 1.575	14 0.551	8 0.315	47 1.850	19 0.748	9 0.354	P.56
<b>FT-V40</b>	400 15.748	200 7.874	130 5.118	200 7.874	100 3.937	65 2.559	290 11.417	140 5.512	92 3.622	P.56
<b>FT-V80Y</b>	120 4.724	60 2.362	35 1.378	80 3.150	40 1.575	25 0.984	75 2.953	38 1.496	24 0.945	P.56
<b>FT-Z20HBW</b>	39 1.535	19 0.748	12 0.472	20 0.787	10 0.394	6 0.236	40 1.575	15 0.591	12 0.472	P.56
<b>FT-Z20W</b>	82 3.228	37 1.457	23 0.906	44 1.732	18 0.709	11 0.433	100 3.937	50 1.969	32 1.260	P.56
<b>FT-Z30</b>	120 4.724	60 2.362	40 1.575	96 3.780	45 1.772	30 1.181	140 5.512	72 2.835	47 1.850	P.56
<b>FT-Z30E</b>	540 21.260	250 9.843	170 6.693	270 10.630	130 5.118	91 3.583	280 11.024	140 5.512	88 3.465	P.56
<b>FT-Z30EW</b>	540 21.260	260 10.236	170 6.693	260 10.236	120 4.724	88 3.465	290 11.417	140 5.512	92 3.622	P.57
<b>FT-Z30H</b>	650 25.591	310 12.205	200 7.874	340 13.386	160 6.299	110 4.331	330 12.992	160 6.299	100 3.937	P.57
<b>FT-Z30HW</b>	540 21.260	260 10.236	170 6.693	260 10.236	120 4.724	88 3.465	290 11.417	140 5.512	92 3.622	P.57
<b>FT-Z30W</b>	83 3.268	40 1.575	25 0.984	73 2.874	36 1.417	25 0.984	100 3.937	52 2.047	34 1.339	P.57
<b>FT-Z40HBW</b>	110 4.331	50 1.969	30 1.181	56 2.205	28 1.102	20 0.787	64 2.520	32 1.260	21 0.827	P.57
<b>FT-Z40W</b>	180 7.087	90 3.543	60 2.362	90 3.543	50 1.969	35 1.378	100 3.937	50 1.969	30 1.181	P.57
<b>FT-Z802Y</b>	320 12.598	160 6.299	120 4.724	160 6.299	80 3.150	60 2.362	320 12.598	160 6.299	120 4.724	P.57

Notes: 1) Note that the sensing range of the free-cut type fiber may be reduced by 20 % max. depending upon how the fiber is cut.

2) Because infrared types are easily affected by humidity, please ask assistance when using them in a humid environment or in an environment with varying humidity.

**Retroreflective type**



Fibers are listed in alphabetic order. Refer to p.5~ "Fiber Selection" for details of each fiber.

Model No.	Sensing range (mm in) (Note 1, 2)									Dimensions
	FX-301B / 311B			FX-301G / 311G			FX-301H			
	LONG	STD	FAST	LONG	STD	FAST	LONG	STD	FAST	
<b>FR-KZ22E</b>	—	—	—	—	—	—	—	—	—	P.58
<b>FR-KZ50E</b>	20 to 160 0.787 to 6.299	20 to 100 0.787 to 3.937	20 to 60 0.787 to 2.362	20 to 110 0.787 to 4.331	20 to 54 0.787 to 2.126	—	20 to 100 0.787 to 3.937	20 to 33 0.787 to 1.299	—	P.58
<b>FR-KZ50H</b>	20 to 140 0.787 to 5.512	20 to 70 0.787 to 2.76	20 to 52 0.787 to 2.047	20 to 90 0.787 to 3.543	20 to 40 0.787 to 1.575	—	20 to 80 0.787 to 3.150	20 to 43 0.787 to 1.693	—	P.58
<b>FR-Z50HW</b>	—	—	—	—	—	—	100 to 410 3.937 to 16.142	—	—	P.58

Notes: 1) Note that the sensing range of the free-cut type fiber may be reduced by 20 % max. depending upon how the fiber is cut.

2) The sensing range is the possible setting range for the attached reflector. The fiber can detect an object less than setting range for the reflector. However, note that if there are any white or highly-reflective surfaces near the fiber head, reflected incident light may affect the fiber head. If this occurs, adjust the threshold value of the amplifier unit before use.

**SENSING RANGE OF BLUE LED / GREEN LED / INFRARED LED**

**Reflective type** 

Fibers are listed in alphabetic order. Refer to p.5~ "Fiber Selection" for details of each fiber.

Model No.	Sensing range (mm in) (Note 1, 2) / Description									Dimensions
	FX-301B / 311B			FX-301G / 311G			FX-301H			
	LONG	STD	FAST	LONG	STD	FAST	LONG	STD	FAST	
<b>FD-30</b>	19 <b>0.748</b>	9 <b>0.354</b>	6 <b>0.236</b>	9 <b>0.354</b>	4.5 <b>0.177</b>	2.5 <b>0.098</b>	8 <b>0.315</b>	4 <b>0.157</b>	2.5 <b>0.098</b>	P.59
<b>FD-31</b>	18 <b>0.709</b>	8 <b>0.315</b>	5 <b>0.197</b>	8 <b>0.315</b>	4 <b>0.157</b>	2 <b>0.079</b>	7 <b>0.276</b>	3 <b>0.118</b>	2 <b>0.079</b>	P.59
<b>FD-31W</b>	7 <b>0.276</b>	4 <b>0.157</b>	1 to 2.5 <b>0.039 to 0.098</b>	5 <b>0.197</b>	1 to 2 <b>0.039 to 0.079</b>	—	6 <b>0.236</b>	3 <b>0.118</b>	—	P.59
<b>FD-32G</b>	22 <b>0.866</b>	11 <b>0.433</b>	8 <b>0.315</b>	15 <b>0.591</b>	6 <b>0.236</b>	4 <b>0.157</b>	11 <b>0.433</b>	6 <b>0.236</b>	2 <b>0.079</b>	P.59
<b>FD-32GX</b>	25 <b>0.984</b>	11 <b>0.433</b>	8 <b>0.315</b>	16 <b>0.630</b>	6 <b>0.236</b>	4 <b>0.157</b>	14 <b>0.551</b>	7 <b>0.276</b>	4 <b>0.157</b>	P.59
<b>FD-40</b>	19 <b>0.748</b>	9 <b>0.354</b>	6 <b>0.236</b>	9 <b>0.354</b>	4.5 <b>0.177</b>	2.5 <b>0.098</b>	8 <b>0.315</b>	4 <b>0.157</b>	2.5 <b>0.098</b>	P.59
<b>FD-41</b>	18 <b>0.709</b>	8 <b>0.315</b>	5 <b>0.197</b>	8 <b>0.315</b>	4 <b>0.157</b>	2 <b>0.079</b>	7 <b>0.276</b>	3 <b>0.118</b>	2 <b>0.079</b>	P.59
<b>FD-41S</b>	18 <b>0.709</b>	8 <b>0.315</b>	5 <b>0.197</b>	8 <b>0.315</b>	4 <b>0.157</b>	2 <b>0.079</b>	7 <b>0.276</b>	3 <b>0.118</b>	2 <b>0.079</b>	P.59
<b>FD-41SW</b>	9 <b>0.354</b>	1 to 4 <b>0.039 to 0.157</b>	1 to 2.5 <b>0.039 to 0.098</b>	1 to 4 <b>0.039 to 0.157</b>	1 to 2 <b>0.039 to 0.079</b>	—	6 <b>0.236</b>	1 to 3 <b>0.039 to 0.118</b>	—	P.59
<b>FD-41W</b>	32 <b>1.260</b>	1 to 15 <b>0.039 to 0.591</b>	1 to 9 <b>0.039 to 0.354</b>	17 <b>0.669</b>	1 to 7.5 <b>0.039 to 0.295</b>	1.5 to 4.5 <b>0.059 to 0.177</b>	18 <b>0.709</b>	1 to 9 <b>0.039 to 0.354</b>	1.5 to 5 <b>0.059 to 0.197</b>	P.59
<b>FD-42G</b>	22 <b>0.866</b>	11 <b>0.433</b>	8 <b>0.315</b>	15 <b>0.591</b>	6 <b>0.236</b>	4 <b>0.157</b>	11 <b>0.433</b>	6 <b>0.236</b>	2 <b>0.079</b>	P.60
<b>FD-42GW</b>	14 <b>0.551</b>	7 <b>0.276</b>	5 <b>0.197</b>	6 <b>0.236</b>	4 <b>0.157</b>	2 <b>0.079</b>	9 <b>0.354</b>	5 <b>0.197</b>	2 <b>0.079</b>	P.60
<b>FD-60</b>	55 <b>2.165</b>	28 <b>1.102</b>	18 <b>0.709</b>	30 <b>1.181</b>	15 <b>0.591</b>	10 <b>0.394</b>	30 <b>1.181</b>	15 <b>0.591</b>	10 <b>0.394</b>	P.60
<b>FD-61</b>	48 <b>1.890</b>	24 <b>0.945</b>	16 <b>0.630</b>	26 <b>1.024</b>	13 <b>0.512</b>	8 <b>0.315</b>	27 <b>1.063</b>	12 <b>0.472</b>	8 <b>0.315</b>	P.60
<b>FD-61G</b>	46 <b>1.811</b>	23 <b>0.906</b>	15 <b>0.591</b>	26 <b>1.024</b>	12 <b>0.472</b>	8 <b>0.315</b>	25 <b>0.984</b>	12 <b>0.472</b>	8 <b>0.315</b>	P.60
<b>FD-61S</b>	48 <b>1.890</b>	24 <b>0.945</b>	16 <b>0.630</b>	26 <b>1.024</b>	13 <b>0.512</b>	8 <b>0.315</b>	27 <b>1.063</b>	12 <b>0.472</b>	8 <b>0.315</b>	P.60
<b>FD-61W</b>	32 <b>1.260</b>	1 to 15 <b>0.039 to 0.591</b>	1 to 9 <b>0.039 to 0.354</b>	17 <b>0.669</b>	1 to 7.5 <b>0.039 to 0.295</b>	1.5 to 4.5 <b>0.059 to 0.177</b>	18 <b>0.709</b>	1 to 9 <b>0.039 to 0.354</b>	1.5 to 5 <b>0.059 to 0.197</b>	P.60
<b>FD-62</b>	80 <b>3.150</b>	1 to 40 <b>0.039 to 1.575</b>	1 to 27 <b>0.039 to 1.063</b>	1 to 42 <b>0.039 to 1.654</b>	1 to 21 <b>0.039 to 0.827</b>	1 to 14 <b>0.039 to 0.551</b>	54 <b>2.126</b>	1 to 26 <b>0.039 to 1.024</b>	1 to 17 <b>0.039 to 0.669</b>	P.60
<b>FD-64X</b>	32 <b>1.260</b>	0.5 to 16 <b>0.020 to 0.630</b>	0.5 to 10 <b>0.020 to 0.394</b>	0.5 to 16 <b>0.020 to 0.630</b>	0.5 to 8 <b>0.020 to 0.315</b>	0.5 to 5 <b>0.020 to 0.197</b>	27 <b>1.063</b>	22 <b>0.866</b>	14 <b>0.551</b>	P.61
<b>FD-A16</b>	19 <b>0.748</b>	14 <b>0.551</b>	—	20 <b>0.787</b>	13 <b>0.512</b>	—	18 <b>0.709</b>	15 <b>0.591</b>	—	P.61
<b>FD-AL11</b>	33 <b>1.299</b>	16 <b>0.630</b>	10 <b>0.394</b>	18 <b>0.709</b>	8 <b>0.315</b>	4.5 <b>0.177</b>	12 <b>0.472</b>	10 <b>0.394</b>	6 <b>0.236</b>	P.61
<b>FD-E13</b>	2 <b>0.079</b>	0.8 <b>0.031</b>	0.5 <b>0.020</b>	0.8 <b>0.031</b>	—	—	2 <b>0.079</b>	1 <b>0.039</b>	—	P.61
<b>FD-E23</b>	6 <b>0.236</b>	3 <b>0.118</b>	2 <b>0.079</b>	3 <b>0.118</b>	1.5 <b>0.059</b>	1 <b>0.039</b>	8 <b>0.315</b>	4 <b>0.157</b>	2.5 <b>0.098</b>	P.61
<b>FD-EG30</b>	6 <b>0.236</b>	3 <b>0.118</b>	2 <b>0.079</b>	3 <b>0.118</b>	1.5 <b>0.059</b>	1 <b>0.039</b>	8 <b>0.315</b>	4 <b>0.157</b>	2.5 <b>0.098</b>	P.61
<b>FD-EG30S</b>	6 <b>0.236</b>	3 <b>0.118</b>	2 <b>0.079</b>	3 <b>0.118</b>	1.5 <b>0.059</b>	1 <b>0.039</b>	8 <b>0.315</b>	4 <b>0.157</b>	2.5 <b>0.098</b>	P.62
<b>FD-EG31</b>	2 <b>0.079</b>	1 <b>0.039</b>	0.5 <b>0.020</b>	1 <b>0.039</b>	—	—	4 <b>0.157</b>	2 <b>0.079</b>	1 <b>0.039</b>	P.62
<b>FD-F4</b>	Applicable pipe diameter: Outer dia. $\phi 6$ to $\phi 26$ mm <b><math>\phi 0.236</math> to <math>\phi 1.024</math> in</b> transparent pipe [PFA (fluorine resin) or equivalently transparent pipe, wall thickness 1 mm <b>0.039 in</b> ] Liquid absent: Beam received, Liquid present: Beam interrupted									P.62
<b>FD-F41</b>	Applicable pipe diameter: Outer dia. $\phi 6$ to $\phi 26$ mm <b><math>\phi 0.236</math> to <math>\phi 1.024</math> in</b> transparent pipe [PVC (vinyl chloride), fluorine resin, polycarbonate, acrylic, glass, wall thickness 1 to 3 mm <b>0.039 to 0.118 in</b> ] Liquid absent: Beam received, Liquid present: Beam interrupted									P.62
<b>FD-F41Y (Note 3)</b>	$\phi 4$ mm <b><math>\phi 0.157</math> in</b> form Protective tube: fluorine resin, length 500 mm <b>19.685 in</b> (cuttable) Liquid surface not contacted: Beam received, Liquid surface contacted: Beam interrupted									P.62
<b>FD-F8Y</b>	—									P.62
<b>FD-FA93</b>	Applicable pipe diameter: Outer dia. $\phi 8$ mm <b><math>\phi 0.315</math> in</b> or more transparent pipe (When used with the tying bands: $\phi 8$ to $\phi 80$ mm <b><math>\phi 0.315</math> to <math>\phi 3.150</math> in</b> ) [PFA (fluorine resin), including translucent] Liquid absent: Beam received, Liquid present: Beam interrupted									P.62
<b>FD-H13-FM2</b>	20 <b>0.787</b>	11 <b>0.433</b>	7 <b>0.276</b>	20 <b>0.787</b>	11 <b>0.433</b>	7 <b>0.276</b>	25 <b>0.984</b>	12 <b>0.472</b>	8 <b>0.315</b>	P.63
<b>FD-H18-L31</b>	—									P.63
<b>FD-H20-21</b>	36 <b>1.417</b>	18 <b>0.709</b>	12 <b>0.472</b>	20 <b>0.787</b>	10 <b>0.394</b>	7 <b>0.276</b>	140 <b>5.512</b>	70 <b>2.756</b>	45 <b>1.772</b>	P.63
<b>FD-H20-M1</b>	36 <b>1.417</b>	18 <b>0.709</b>	12 <b>0.472</b>	20 <b>0.787</b>	10 <b>0.394</b>	7 <b>0.276</b>	140 <b>5.512</b>	70 <b>2.756</b>	45 <b>1.772</b>	P.63
<b>FD-H25-L43 (Note 4)</b>	—									P.63
<b>FD-H25-L45 (Note 4)</b>	—									P.63

- Notes: 1) Note that the sensing range of the free-cut type fiber may be reduced by 20 % max. depending upon how the fiber is cut.  
 2) The sensing range is specified for white non-glossy paper. (**FP-H18-L31** 50 × 50 mm **1.969 × 1.969 in.** glass substrate).  
 3) Liquid inflow prevention joint, protective tube extension joint, fiber mounting joint are available. Please refer to p.38 for details.  
 4) The sensing range is specified for transparent glass 100 × 100 × t0.7 mm **3.937 × 3.937 × t0.028 in**

FIBER SENSORS

LASER SENSORS

PHOTO-ELECTRIC SENSORS

MICRO PHOTO-ELECTRIC SENSORS

AREA SENSORS

LIGHT CURTAINS / SAFETY COMPONENTS

PRESSURE / FLOW SENSORS

INDUCTIVE PROXIMITY SENSORS

PARTICULAR USE SENSORS

SENSOR OPTIONS

SMALL WIRE-SAVING UNITS

WIRE-SAVING SYSTEMS

MEASUREMENT SENSORS

STATIC ELECTRICITY PREVENTION DEVICES

LASER MARKERS

PLC

HUMAN MACHINE INTERFACES

ENERGY CONSUMPTION VISUALIZATION COMPONENTS

FA COMPONENTS

MACHINE VISION SYSTEMS

UV CURING SYSTEMS

Selection Guide

Fibers

Fiber Amplifiers

**FX-500**

**FX-100**

**FX-300**

**FX-410**

**FX-311**

**FX-301-F7 / FX-301-F**



**SENSING RANGE OF BLUE LED / GREEN LED / INFRARED LED**

**Reflective type**



Fibers are listed in alphabetic order. Refer to p.5~ "Fiber Selection" for details of each fiber.

Model No.	Sensing range (mm in) (Note 1, 2) / Description									Dimensions
	FX-301B / 311B			FX-301G / 311G			FX-301H			
	LONG	STD	FAST	LONG	STD	FAST	LONG	STD	FAST	
FD-H30-KZ1V-S (Note 3,4)	30 to 40 1.181 to 1.575	—	—	—	—	—	—	—	—	P.64
FD-H30-L32	—	—	—	—	—	—	—	—	—	P.64
FD-H30-L32V-S (Note 3,4)	—	—	—	—	—	—	—	—	—	P.64
FD-H35-20S	22 0.866	11 0.433	7 0.276	12 0.472	6 0.236	4 0.157	80 3.150	40 1.575	28 1.102	P.64
FD-H35-M2	36 1.417	18 0.709	12 0.472	20 0.787	10 0.394	7 0.276	140 5.512	70 2.756	45 1.772	P.64
FD-H35-M2S6	36 1.417	18 0.709	12 0.472	20 0.787	10 0.394	7 0.276	140 5.512	70 2.756	45 1.772	P.64
FD-HF40Y (Note 5)	ø4 mm ø0.157 in form Protective tube: fluorine resin, length:500 mm 19.685 in (allowable cutting) Liquid surface not contacted: Beam received, Liquid surface contacted: Beam interrupted									P.64
FD-L10 (Note 6)	0 to 3.5 0 to 0.138	0 to 3 0 to 0.118	0.5 to 2.5 0.020 to 0.098	0 to 3 0 to 0.118	1 to 2 0.039 to 0.079	—	0 to 3 0 to 0.118	1 to 2 0.039 to 0.079	—	P.65
FD-L11 (Note 6)	7 0.276	6.5 0.256	0.5 to 5.5 0.020 to 0.217	6.5 0.256	1 to 4 0.039 to 0.157	—	6.5 0.256	1 to 4.5 0.039 to 0.177	—	P.65
FD-L12W (Note 6)	—	—	—	—	—	—	—	—	—	P.65
FD-L20H	4.5 to 10 0.177 to 0.394	5 to 9 0.197 to 0.354	5.5 to 8 0.217 to 0.315	5 to 9 0.197 to 0.354	5.5 to 8 0.217 to 0.315	—	4.9 to 8.5 0.193 to 0.335	—	—	P.65
FD-L21 (Note 6)	—	—	—	—	—	—	—	—	—	P.65
FD-L21W (Note 6)	—	—	—	—	—	—	—	—	—	P.65
FD-L22A (Note 6)	—	—	—	—	—	—	—	—	—	P.65
FD-L23 (Note 6)	—	—	—	—	—	—	—	—	—	P.65
FD-L30A (Note 6)	—	—	—	—	—	—	—	—	—	P.65
FD-L31A (Note 6)	—	—	—	—	—	—	—	—	—	P.65
FD-L32H (Note 6)	—	—	—	—	—	—	—	—	—	P.66
FD-R31G	17 0.669	8 0.315	5 0.197	8 0.315	4 0.157	2 0.079	9 0.354	4 0.157	2 0.079	P.66
FD-R32EG	6 0.236	3 0.118	1.5 0.059	2 0.079	1 0.039	—	8 0.315	4 0.157	2.5 0.098	P.66
FD-R33EG	2 0.079	0.8 0.031	0.5 0.020	1 0.039	—	—	3 0.118	1.5 0.059	—	P.66
FD-R34EG	5 0.197	2 0.079	1.5 0.059	2 0.079	1 0.039	—	6 0.236	3 0.118	2 0.079	P.66
FD-R41	24 0.945	1 to 13 0.039 to 0.512	1 to 9 0.039 to 0.354	1 to 15 0.039 to 0.591	1 to 8 0.039 to 0.315	3 to 6 0.118 to 0.236	14 0.551	1 to 6 0.039 to 0.236	1 to 3 0.039 to 0.118	P.66
FD-R60	42 1.654	20 0.787	0.5 to 13 0.020 to 0.512	21 0.827	0.5 to 10 0.020 to 0.394	0.5 to 7 0.020 to 0.276	27 1.063	12 0.472	8 0.315	P.66
FD-R61Y	36 1.417	17 0.669	0.5 to 11 0.020 to 0.433	19 0.748	0.5 to 9 0.020 to 0.354	1 to 6 0.039 to 0.236	19 0.748	0.5 to 10 0.020 to 0.394	0.5 to 6 0.020 to 0.236	P.66
FD-S21	8 0.315	3.5 0.138	2 0.079	5 0.197	2 0.079	1.3 0.051	9 0.354	4 0.157	3 0.118	P.66
FD-S30	19 0.749	9 0.354	6 0.236	9 0.354	4.5 0.177	2.5 0.098	8 0.315	4 0.157	2.5 0.098	P.67
FD-S31	18 0.709	8 0.315	5 0.197	8 0.315	4 0.157	2 0.079	7 0.276	3 0.118	2 0.079	P.67
FD-S32	48 1.890	24 0.945	16 0.630	26 1.024	13 0.512	8 0.315	27 1.063	12 0.472	8 0.315	P.67
FD-S32W	32 1.260	1 to 15 0.039 to 0.591	1 to 9 0.039 to 0.354	17 0.669	1 to 7.5 0.039 to 0.295	1.5 to 4.5 0.059 to 0.177	18 0.709	1 to 9 0.039 to 0.354	1.5 to 5 0.059 to 0.197	P.67
FD-S33GW	14 0.551	7 0.276	5 0.197	6 0.236	4 0.157	2 0.079	9 0.354	5 0.197	2 0.079	P.67
FD-S60Y	50 1.969	20 0.787	3 to 12 0.118 to 0.472	28 1.102	3 to 9 0.118 to 0.354	—	30 1.181	2 to 13 0.079 to 0.512	5 to 6.5 0.197 to 0.256	P.67
FD-V30	9 0.354	—	—	—	—	—	—	—	—	P.67
FD-V30W	—	—	—	—	—	—	—	—	—	P.67
FD-V50	12 0.472	—	—	6 0.236	—	—	6 0.236	—	—	P.68
FD-Z20HBW	4 to 10 0.157 to 0.394	—	—	—	—	—	3 to 11 0.118 to 0.433	4 to 6 0.157 to 0.236	—	P.68
FD-Z20W	—	—	—	—	—	—	5 to 8 0.197 to 0.315	—	—	P.68
FD-Z40HBW	1 to 36 0.039 to 1.417	3 to 17 1.181 to 0.689	3 to 11 1.181 to 0.433	2 to 19 0.079 to 0.748	3 to 8 0.118 to 0.315	4 to 5 0.157 to 0.197	2 to 20 0.0787 to 0.787	3 to 10 0.118 to 0.394	4 to 5.5 0.157 to 0.217	P.68
FD-Z40W	4 to 20 0.157 to 0.787	—	—	4 to 14 0.157 to 0.551	—	—	5 to 10 0.197 to 0.394	—	—	P.68
FD-Z50HW	—	—	—	—	—	—	—	—	—	P.68

- Notes: 1) The standard sensing objects of the sensing ranges vary depending on the fibers.
- 2) Note 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 of reflective type is the value for white non-glossy paper.
- 4) Sold as a set comprising vacuum type fiber + photo-terminal (FV-BR1) + fiber at atmospheric side (FT-J8).
- 5) Liquid inflow prevention joint, protective tube extension joint, fiber mounting joint are available. Please refer to p.38 for details.
- 6) The sensing range is specified for transparent glass 100 × 100 × t.0.07 mm 3.937 × 3.937 × t.0.028 in, (FD-L32H: R-edge, FD-L21 and FD-L21W: t2 mm t0.079 in) [FD-L10: silicon wafers 100 × 100 mm 3.937 × 3.937 in]