

Digital Fiber Sensor

FX-300 SERIES

Sensing Range



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 "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	
FT-140	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
FT-30	450	17.717	310	12.205	210	8.268	150	5.906	110	4.331	60	2.362	60	2.362	P.51
FT-31	440	17.323	290	11.417	200	7.874	142	5.591	105	4.134	58	2.283	49	1.929	P.51
FT-31S	440	17.323	290	11.417	200	7.874	140	5.512	100	3.937	55	2.165	49	1.929	P.51
FT-31W	300	11.811	230	9.055	130	5.118	100	3.937	65	2.559	30	1.181	30	1.181	P.51
FT-40	1,300	51.181	900	35.433	600	23.622	450	17.717	330	12.992	180	7.087	180	7.087	P.51
FT-42	1,100	43.307	800	31.496	550	21.654	400	15.748	285	11.220	160	6.299	150	5.906	P.51
FT-42S	1,100	43.307	800	31.496	550	21.654	400	15.748	285	11.220	160	6.299	150	5.906	P.51
FT-42W	1,000	39.370	710	27.953	460	18.110	330	12.992	240	9.449	130	5.118	130	5.118	P.51
FT-43	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
FT-45X	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
FT-A11	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
FT-A11W	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
FT-A32	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
FT-A32W	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
FT-AL05	760	29.921	680	26.772	340	13.386	330	12.992	230	9.055	130	5.118	130	5.118	P.52
FT-E13	20	0.787	13	0.512	9	0.354	6	0.236	5	0.197	2	0.079	2	0.079	P.52
FT-E23	95	3.740	65	2.559	42	1.654	31	1.220	22	0.866	12	0.472	12	0.472	P.52
FT-H13-FM2	1,200	47.244	880	34.646	550	21.654	440	17.323	300	11.811	150	5.906	155	6.102	P.52
FT-H20-J20-S (Note 4)	530	20.866	390	15.354	225	8.858	200	7.874	140	5.512	60	2.362	60	2.362	P.53
FT-H20-J30-S (Note 4)	530	20.866	390	15.354	225	8.858	200	7.874	140	5.512	60	2.362	60	2.362	P.53
FT-H20-J50-S (Note 4)	530	20.866	390	15.354	225	8.858	200	7.874	140	5.512	60	2.362	60	2.362	P.53
FT-H20-M1	750	29.528	550	21.654	320	12.598	280	11.024	200	7.874	85	3.346	90	3.543	P.53
FT-H20-VJ50-S (Note 4)	840	33.071	550	21.654	370	14.567	280	11.024	200	7.874	90	3.543	90	3.543	P.53
FT-H20-VJ80-S (Note 4)	840	33.071	550	21.654	370	14.567	280	11.024	200	7.874	90	3.543	90	3.543	P.53
FT-H20W-M1	420	16.535	310	12.205	180	7.087	140	5.512	100	3.937	40	1.575	50	1.969	P.53
FT-H30-M1V-S (Note 5)	350	13.78	250	9.843	150	5.906	125	4.921	90	3.543	50	1.969	40	1.575	P.53
FT-H35-M2	750	29.528	550	21.654	330	12.992	280	11.024	200	7.874	85	3.346	90	3.543	P.53
FT-H35-M2S6	750	29.528	550	21.654	330	12.992	280	11.024	200	7.874	85	3.346	90	3.543	P.53
FT-HL80Y	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
FT-KS40	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
FT-KV26	800	31.496	710	27.953	340	13.386	310	12.205	220	8.661	120	4.724	120	4.724	P.54
FT-KV40	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
FT-KV40W	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
FT-L80Y	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 "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				
FT-R31	340 13.386	290 11.417	150 5.906	130 5.118	95 3.740	49 1.929	49 1.929	P.54			
FT-R40	1,000 39.370	710 27.953	470 18.504	330 12.992	240 9.449	130 5.118	130 5.118	P.54			
FT-R41W	1,000 39.370	710 27.953	460 18.110	330 12.992	240 9.449	130 5.118	130 5.118	P.54			
FT-R42W	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			
FT-R43	1,000 39.370	710 27.953	450 17.717	290 11.417	210 8.268	110 4.331	110 4.331	P.54			
FT-R44Y	1,000 39.370	710 27.958	450 17.717	290 11.417	210 8.268	110 4.330	110 4.330	P.55			
FT-R60Y	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			
FT-S11	100 3.937	80 3.150	50 1.969	31 1.220	22 0.866	13 0.512	14 0.551	P.55			
FT-S20	450 17.717	310 12.205	210 8.268	150 5.906	110 4.331	60 2.362	60 2.362	P.55			
FT-S21	440 17.323	290 11.417	200 7.874	142 5.591	105 4.134	58 2.283	49 1.929	P.55			
FT-S21W	300 11.811	230 9.055	130 5.118	100 3.937	65 2.559	30 1.181	30 1.181	P.55			
FT-S30	1,300 51.181	900 35.433	600 23.622	450 17.717	330 12.992	180 7.087	180 7.087	P.55			
FT-S31W	1,000 39.370	710 27.953	460 18.110	330 12.992	240 9.449	130 5.118	130 5.118	P.55			
FT-S32	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			
FT-V23	590 23.228	380 14.961	270 10.630	170 6.693	125 4.921	60 2.362	63 2.480	P.55			
FT-V24W	120 4.724	90 3.543	55 2.165	40 1.575	30 1.181	13 0.512	15 0.591	P.56			
FT-V25	310 12.205	200 7.874	130 5.118	90 3.543	60 2.362	35 1.378	35 1.378	P.56			
FT-V30	620 24.409	420 16.535	270 10.630	200 7.874	140 5.512	70 2.756	70 2.756	P.56			
FT-V40	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			
FT-V80Y	1,000 39.370	800 31.496	500 19.685	400 15.748	280 11.024	120 4.724	140 5.512	P.56			
FT-Z20HBW	400 15.748	290 11.417	160 6.299	130 5.118	90 3.543	50 1.969	50 1.969	P.56			
FT-Z20W	830 32.677	570 22.441	370 14.567	250 9.843	180 7.087	90 3.543	90 3.543	P.56			
FT-Z30	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			
FT-Z30E	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			
FT-Z30EW	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			
FT-Z30H	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			
FT-Z30HW	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			
FT-Z30W	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			
FT-Z40HBW	1,000 39.370	710 27.953	460 18.110	330 12.992	240 9.449	130 5.118	130 5.118	P.57			
FT-Z40W	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			
FT-Z802Y	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.

LIST OF FIBERS

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 "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		
FR-KZ22E	15 to 370 0.591 to 14.567	15 to 330 0.591 to 12.992	15 to 240 0.591 to 9.449	15 to 210 0.591 to 8.268	15 to 170 0.590 to 6.693	15 to 80 0.591 to 3.150	15 to 90 0.591 to 3.543	P.58	
FR-KZ50E	20 to 350 0.787 to 13.780	20 to 300 0.787 to 11.811	20 to 250 0.787 to 9.843	20 to 200 0.787 to 7.874	20 to 200 0.787 to 7.874	20 to 200 0.787 to 7.874	20 to 200 0.787 to 7.874	P.58	
FR-KZ50H	20 to 350 0.787 to 13.780	20 to 300 0.787 to 11.811	20 to 250 0.787 to 9.843	20 to 200 0.787 to 7.874	20 to 200 0.787 to 7.874	20 to 200 0.787 to 7.874	20 to 200 0.787 to 7.874	P.58	
FR-Z50HW	100 to 920 3.937 to 36.220	100 to 810 3.937 to 31.890	100 to 660 3.937 to 25.984	100 to 580 3.937 to 22.835	100 to 490 3.937 to 19.291	100 to 340 3.937 to 13.385	100 to 270 3.937 to 10.630	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 / 305							FX-301-HS
	U-LG	LONG	STDF	STD	FAST	S-D	H-SP	H-SP
RF-230	100 to 7,500 3.937 to 295.276	100 to 3,200 3.937 to 125.984	100 to 2,900 3.937 to 114.173	100 to 2,000 3.937 to 78.740	100 to 1,600 3.937 to 62.992	100 to 1,000 3.937 to 39.370	100 to 900 3.937 to 35.433	100 to 700 3.937 to 27.559
RF-220	100 to 2,400 3.937 to 94.488	100 to 2,400 3.937 to 94.488	100 to 1,900 3.937 to 74.803	100 to 1,300 3.937 to 51.181	100 to 1,000 3.937 to 39.370	100 to 600 3.937 to 23.622	100 to 570 3.937 to 22.441	100 to 350 3.937 to 13.780
RF-210	100 to 2,100 3.937 to 82.677	100 to 1,700 3.937 to 66.929	100 to 1,300 3.937 to 51.181	100 to 910 3.937 to 35.827	100 to 710 3.937 to 27.953	100 to 460 3.937 to 18.110	100 to 440 3.937 to 17.323	—

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 "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		
FD-30	170	6.693	110	4.331	70	2.756	50	1.969	40	1.575	20	0.787	18	0.709	P.59
FD-31	150	5.906	95	3.740	63	2.480	45	1.772	35	1.378	17	0.669	16	0.630	P.59
FD-31W	60	2.362	40	1.575	30	1.181	20	0.787	15	0.591	8	0.315	10	0.394	P.59
FD-32G	210	8.268	120	4.724	100	3.937	60	2.362	42	1.654	20	0.787	20	0.787	P.59
FD-32GX	240	9.449	140	5.512	100	3.937	70	2.756	50	1.969	25	0.984	25	0.984	P.59
FD-40	170	6.693	110	4.331	70	2.756	50	1.969	40	1.575	20	0.787	18	0.709	P.59
FD-41	150	5.906	95	3.740	63	2.480	45	1.772	35	1.378	17	0.669	16	0.630	P.59
FD-41S	150	5.906	95	3.740	63	2.480	45	1.772	35	1.378	17	0.669	16	0.630	P.59
FD-41SW	60	2.362	40	1.575	30	1.181	20	0.787	15	0.591	8	0.315	10	0.394	P.59
FD-41W	300	11.811	220	8.661	140	5.512	95	3.740	70	2.756	35	1.378	40	1.575	P.59
FD-42G	210	8.268	120	4.724	100	3.937	60	2.362	42	1.654	20	0.787	20	0.787	P.60
FD-42GW	160	6.299	85	3.346	70	2.756	35	1.378	25	0.984	13	0.512	14	0.551	P.60
FD-60	500	19.685	350	13.780	240	9.449	160	6.299	130	5.118	70	2.756	70	2.756	P.60
FD-61	440	17.323	320	12.598	205	8.071	145	5.709	105	4.134	65	2.559	60	2.362	P.60
FD-61G	460	18.110	200	7.874	210	8.268	90	3.543	65	2.559	35	1.378	40	1.575	P.60
FD-61S	440	17.323	320	12.598	205	8.071	145	5.709	105	4.134	60	2.362	60	2.362	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 "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								
FD-61W	300	11.811	220	8.661	140	5.512	95	3.740	70	2.756	35	1.378	40	1.575	P.60
FD-62	690	27.165	480	18.898	310	12.205	220	8.661	160	6.299	85	3.346	90	3.543	P.60
FD-64X	270	10.630	200	7.874	100	3.937	85	3.346	60	2.362	35	1.378	35	1.378	P.61
FD-A16	230	9.055	200	7.874	150	5.906	150	5.906	100	3.937	45	1.772	50	1.969	P.61
FD-AL11	360	14.173	250	9.843	160	6.299	110	4.331	80	3.150	40	1.575	40	1.575	P.61
FD-E13	15	0.591	11	0.433	7	0.276	6	0.236	4	0.157	2	0.079	2	0.079	P.61
FD-E23	65	2.559	45	1.772	28	1.102	19	0.748	14	0.551	7	0.276	7	0.276	P.61
FD-EG30	60	2.362	45	1.772	25	0.984	19	0.748	14	0.551	7	0.276	7	0.276	P.61
FD-EG30S	60	2.362	45	1.772	25	0.984	19	0.748	14	0.551	7	0.276	7	0.276	P.62
FD-EG31	20	0.787	15	0.591	9	0.354	8	0.315	5	0.197	2.5	0.098	3	0.118	P.62
FD-F4	Applicable pipe diameter: Outer dia. ø6 to ø26 mm ø0.236 to ø1.024 in transparent pipe [PFA (fluorine resin) or equivalently transparent pipe, wall thickness 1 mm 0.039 in]														P.62
FD-F41	Applicable pipe diameter: Outer dia. ø6 to ø26 mm ø0.236 to ø1.024 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
FD-F41Y	ø4 mm ø0.157 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
FD-F8Y	————	————	————	————	————	————	————	————	————	————	————	————	————	————	P.62
FD-FA93	Applicable pipe diameter: Outer dia. ø8 mm ø0.315 in or more transparent pipe (When used with the tying bands: ø8 to ø80 mm ø0.315 to ø3.150 in) [PFA (fluorine resin), including translucent] Liquid absent: Beam received, Liquid present: Beam interrupted														P.62
FD-H13-FM2	410	16.142	310	12.205	200	7.874	140	5.512	100	3.937	55	2.165	47	1.850	P.63
FD-H18-L31	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	
FD-H20-21	300	11.811	270	10.630	150	5.906	140	5.512	100	3.937	35	1.378	47	1.850	P.63
FD-H20-M1	300	11.811	270	10.630	150	5.906	140	5.512	100	3.937	35	1.378	47	1.850	P.63
FD-H25-L43 (Note 5)	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
FD-H25-L45 (Note 5)	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
FD-H30-KZ1V-S (Note 5,6)	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
FD-H30-L32	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	
FD-H30-L32V-S (Note 5,6)	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
FD-H35-20S	190	7.480	160	6.299	80	3.150	80	3.150	57	2.244	20	0.787	26	1.024	P.64
FD-H35-M2	300	11.811	270	10.630	150	5.906	140	5.512	100	3.937	35	1.378	47	1.850	P.64
FD-H35-M2S6	300	11.811	270	10.630	150	5.906	140	5.512	100	3.937	35	1.378	47	1.850	P.64
FD-HF40Y (Note 4)	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 5)	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
FD-L11 (Note 5)	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
FD-L12W (Note 5)	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
FD-L20H	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
FD-L21 (Note 5)	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
FD-L21W (Note 5)	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
FD-L22A (Note 5)	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.

5) The sensing range is specified for transparent glass 100 × 100 × t0.7 mm 3.937 × 3.937 × t0.028 in (**FD-L21** and **FD-L21W**: t2 mm t0.079 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**).

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 "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			
FD-L23 (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	
FD-L30A (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	
FD-L31A (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	
FD-L32H (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	
FD-R31G	160 6.299	92 3.622	75 2.953	44 1.732	32 1.260	17 0.669	17 0.669		P.66	
FD-R32EG	60 2.362	45 1.772	25 0.984	19 0.748	13 0.512	7 0.276	7 0.276		P.66	
FD-R33EG	17 0.669	15 0.591	8 0.315	6 0.236	4 0.157	2 0.079	2 0.079		P.66	
FD-R34EG	51 2.008	38 1.496	21 0.827	16 0.630	11 0.433	6 0.236	6 0.236		P.66	
FD-R41	230 9.055	150 5.906	100 3.937	70 2.756	50 1.969	28 1.102	28 1.102		P.66	
FD-R60	310 12.205	240 9.449	170 6.693	120 4.724	90 3.543	45 1.772	45 1.772		P.66	
FD-R61Y	350 13.780	230 9.055	160 6.299	110 4.330	80 3.150	45 1.772	45 1.772		P.66	
FD-S21	80 3.150	50 1.969	40 1.575	25 0.984	19 0.748	9 0.354	9 0.354		P.66	
FD-S30	170 6.693	110 4.331	70 2.756	50 1.969	40 1.575	20 0.787	18 0.709		P.67	
FD-S31	150 5.906	95 3.740	63 2.480	45 1.772	35 1.378	17 0.669	16 0.630		P.67	
FD-S32	440 17.323	270 10.630	200 7.874	140 5.512	100 3.937	55 2.165	55 2.165		P.67	
FD-S32W	300 11.811	220 8.661	140 5.512	95 3.740	70 2.756	35 1.378	40 1.575		P.67	
FD-S33GW	160 6.299	85 3.346	70 2.756	35 1.378	25 0.984	13 0.512	14 0.551		P.67	
FD-S60Y	410 16.142	360 14.173	250 9.843	170 6.693	120 4.724	65 2.559	70 2.756		P.67	
FD-V30	80 3.150	45 1.772	30 1.181	20 0.787	15 0.591	6 0.236	7 0.276		P.67	
FD-V30W	25 0.984	15 0.591	10 0.394	7 0.276	5 0.197	————	————		P.67	
FD-V50	170 6.693	100 3.937	55 2.165	45 1.772	32 1.260	15 0.591	16 0.630		P.68	
FD-Z20HBW	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	
FD-Z20W	1 to 87 0.039 to 3.425	1 to 59 0.9 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	
FD-Z40HBW	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	
FD-Z40W	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	
FD-Z50HW	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 "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	
FT-140	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
FT-30	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
FT-31	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
FT-31S	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
FT-31W	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
FT-40	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
FT-42	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
FT-42S	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
FT-42W	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
FT-43	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
FT-45X	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
FT-A11	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
FT-A11W	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
FT-A32	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
FT-A32W	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
FT-AL05	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
FT-E13	2 0.079	1 0.039	————	1 0.039	————	————	2 0.079	1 0.039	————	P.52
FT-E23	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
FT-H13-FM2	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
FT-H20-J20-S (Note 3)	60 2.362	20 0.787	————	35 1.378	————	————	20 0.787	————	————	P.53
FT-H20-J30-S (Note 3)	60 2.362	20 0.787	————	35 1.378	————	————	20 0.787	————	————	P.53
FT-H20-J50-S (Note 3)	60 2.362	20 0.787	————	35 1.378	————	————	20 0.787	————	————	P.53
FT-H20-M1	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
FT-H20-VJ50-S (Note 3)	85 3.346	30 1.181	————	50 1.969	————	————	30 1.181	————	————	P.53
FT-H20-VJ80-S (Note 3)	85 3.346	30 1.181	————	50 1.969	————	————	30 1.181	————	————	P.53
FT-H20W-M1	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
FT-H30-M1V-S (Note 4)	40 1.575	20 0.787	————	20 0.787	————	————	20 0.787	————	————	P.53
FT-H35-M2	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
FT-H35-M2S6	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
FT-HL80Y	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
FT-KS40	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
FT-KV26	81 3.189	36 1.417	21 0.827	44 1.732	8 0.315	————	53 2.087	19 0.748	————	P.54
FT-KV40	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
FT-KV40W	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
FT-L80Y	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
FT-R31	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
FT-R40	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
FT-R41W	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
FT-R42W	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**).

SENSING RANGE OF BLUE LED / GREEN LED / INFRARED LED

Thru-beam type (One pair set)



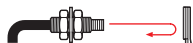
Fibers are listed in alphabetic order. Refer to "Fiber Selection" for details of each fiber.

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	
FT-R43	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
FT-R44Y	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
FT-R60Y	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
FT-S11	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
FT-S20	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
FT-S21	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
FT-S21W	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
FT-S30	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
FT-S31W	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
FT-S32	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
FT-V23	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
FT-V24W	6 0.236	2 0.079	————	3 0.118	————	————	3 0.118	————	————	P.56
FT-V25	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
FT-V30	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
FT-V40	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
FT-V80Y	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
FT-Z20HBW	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
FT-Z20W	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
FT-Z30	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
FT-Z30E	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
FT-Z30EW	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
FT-Z30H	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
FT-Z30HW	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
FT-Z30W	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
FT-Z40HBW	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
FT-Z40W	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
FT-Z802Y	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 "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	
FR-KZ22E	————	————	————	————	————	————	————	————	————	P.58
FR-KZ50E	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
FR-KZ50H	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
FR-Z50HW	————	————	————	————	————	————	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

Relective type



Fibers are listed in alphabetic order. Refer to "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-30	19 0.748	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.59
FD-31	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.59
FD-31W	7 0.276	4 0.157	1 to 2.5 0.039 to 0.098	5 0.197	1 to 2 0.039 to 0.079	————	6 0.236	3 0.118	————	P.59
FD-32G	22 0.866	11 0.433	8 0.315	15 0.591	6 0.236	4 0.157	11 0.433	6 0.236	2 0.079	P.59
FD-32GX	25 0.984	11 0.433	8 0.315	16 0.630	6 0.236	4 0.157	14 0.551	7 0.276	4 0.157	P.59
FD-40	19 0.748	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.59
FD-41	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.59
FD-41S	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.59
FD-41SW	9 0.354	1 to 4 0.039 to 0.157	1 to 2.5 0.039 to 0.098	1 to 4 0.039 to 0.157	1 to 2 0.039 to 0.079	————	6 0.236	1 to 3 0.039 to 0.118	————	P.59
FD-41W	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.59
FD-42G	22 0.866	11 0.433	8 0.315	15 0.591	6 0.236	4 0.157	11 0.433	6 0.236	2 0.079	P.60
FD-42GW	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.60
FD-60	55 2.165	28 1.102	18 0.709	30 1.181	15 0.591	10 0.394	30 1.181	15 0.591	10 0.394	P.60
FD-61	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.60
FD-61G	46 1.811	23 0.906	15 0.591	26 1.024	12 0.472	8 0.315	25 0.984	12 0.472	8 0.315	P.60
FD-61S	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.60
FD-61W	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.60
FD-62	80 3.150	1 to 40 0.039 to 1.575	1 to 27 0.039 to 1.063	1 to 42 0.039 to 1.654	1 to 21 0.039 to 0.827	1 to 14 0.039 to 0.551	54 2.126	1 to 26 0.039 to 1.024	1 to 17 0.039 to 0.669	P.60
FD-64X	32 1.260	0.5 to 16 0.020 to 0.630	0.5 to 10 0.020 to 0.394	0.5 to 16 0.020 to 0.630	0.5 to 8 0.020 to 0.315	0.5 to 5 0.020 to 0.197	27 1.063	22 0.866	14 0.551	P.61
FD-A16	19 0.748	14 0.551	————	20 0.787	13 0.512	————	18 0.709	15 0.591	————	P.61
FD-AL11	33 1.299	16 0.630	10 0.394	18 0.709	8 0.315	4.5 0.177	12 0.472	10 0.394	6 0.236	P.61
FD-E13	2 0.079	0.8 0.031	0.5 0.020	0.8 0.031	————	————	2 0.079	1 0.039	————	P.61
FD-E23	6 0.236	3 0.118	2 0.079	3 0.118	1.5 0.059	1 0.039	8 0.315	4 0.157	2.5 0.098	P.61
FD-EG30	6 0.236	3 0.118	2 0.079	3 0.118	1.5 0.059	1 0.039	8 0.315	4 0.157	2.5 0.098	P.61
FD-EG30S	6 0.236	3 0.118	2 0.079	3 0.118	1.5 0.059	1 0.039	8 0.315	4 0.157	2.5 0.098	P.62
FD-EG31	2 0.079	1 0.039	0.5 0.020	1 0.039	————	————	4 0.157	2 0.079	1 0.039	P.62
FD-F4	Applicable pipe diameter: Outer dia. ø6 to ø26 mm ø0.236 to ø1.024 in transparent pipe [PFA (fluorine resin) or equivalently transparent pipe, wall thickness 1 mm 0.039 in] Liquid absent: Beam received, Liquid present: Beam interrupted									P.62
FD-F41	Applicable pipe diameter: Outer dia. ø6 to ø26 mm ø0.236 to ø1.024 in transparent pipe [PVC (vinyl chloride), fluorine resin, polycarbonate, acrylic, glass, wall thickness 1 to 3 mm 0.039 to 0.118 in] Liquid absent: Beam received, Liquid present: Beam interrupted									P.62
FD-F41Y (Note 3)	ø4 mm ø0.157 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
FD-F8Y	————	————	————	————	————	————	————	————	————	P.62
FD-FA93	Applicable pipe diameter: Outer dia. ø8 mm ø0.315 in or more transparent pipe (When used with the tying bands: ø8 to ø80 mm ø0.315 to ø3.150 in) [PFA (fluorine resin), including translucent] Liquid absent: Beam received, Liquid present: Beam interrupted									P.62
FD-H13-FM2	20 0.787	11 0.433	7 0.276	20 0.787	11 0.433	7 0.276	25 0.984	12 0.472	8 0.315	P.63
FD-H18-L31	————	————	————	————	————	————	————	————	————	P.63
FD-H20-21	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.63
FD-H20-M1	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.63
FD-H25-L43 (Note 4)	————	————	————	————	————	————	————	————	————	P.63
FD-H25-L45 (Note 4)	————	————	————	————	————	————	————	————	————	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.
 4) The sensing range is specified for transparent glass 100 × 100 × 0.7 mm 3.937 × 3.937 × 0.028 in

SENSING RANGE OF BLUE LED / GREEN LED / INFRARED LED

Re lective type



Fibers are listed in alphabetic order. Refer to "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 0.669	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 0.079 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.

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]

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Panasonic
INDUSTRY

Panasonic Industry Co., Ltd.

Industrial Device Business Division

7-1-1, Morofuku, Daito-shi, Osaka 574-0044, Japan

industrial.panasonic.com/ac/e/