

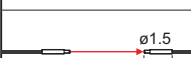

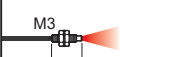

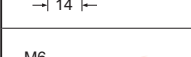
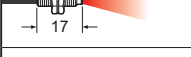


Tough : Refer to a fiber which possesses both unbreakable (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°) and more flexible (bending radius: R4 mm **R0.157 in** or less) features.
Bending durability : Refer to a fiber which possesses unbreakable bending-resistant feature (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°).

LIST OF FIBERS

Super quality type

*Thru-beam type sensors are available as two pieces per set.

Type	Shape of fiber head (mm)	Model No.	Bending radius (mm)	Fiber cable length	Sensing range (mm in) (Note 2, 3)				Beam axis position / Inclination of beam axis (mm)	Optical transmission loss	Protection	Ambient temp.		
					FX-500 series	Other modes	U-LG LONG FAST H-SP	FX-550 / FX-550L series					Other modes	U-LG LONG FAST
Thru-beam	Threaded	M3 	Tough (Bending durability) FT-30	R2	2 m (Note 4)	STD 400 15.748 HYPR 1,350 53.150	810 31.890 650 25.591 210 8.268 75 2.953	STD 570 22.441 HYPR 1,860 73.228	1,240 48.819 830 32.677 340 13.386	ø0.5	150 μm / ±2°	±10 %	IP67	-55 to +80 °C
		M4 	Tough (Bending durability) FT-40	R4		STD 1,200 47.244 HYPR 3,600 141.732	2,200 86.614 1,700 66.929 530 20.866 190 7.480	STD 1,570 61.811 HYPR 3,600 141.732 (Note 1)	3,100 122.047 2,200 86.614 960 37.795					
	Cylindrical	ø1.5 	Tough (Bending durability) FT-S20	R2		STD 400 15.748 HYPR 1,350 53.150	810 31.890 650 25.591 210 8.268 75 2.953	STD 550 21.654 HYPR 1,760 69.291	1,200 47.244 800 31.496 340 13.386					
		ø3 	Tough (Bending durability) FT-S30	R4		STD 1,200 47.244 HYPR 3,600 141.732	2,200 86.614 1,700 66.929 530 20.866 190 7.480	STD 1,650 64.961 HYPR 3,600 141.732 (Note 1)	3,100 122.047 2,250 88.583 1,000 39.370					
Reflective	Threaded	M3 	Tough (Bending durability) FD-30	R2	2 m (Note 4)	STD 160 6.299 HYPR 600 23.622	330 12.992 250 9.843 80 3.150 25 0.984	STD 210 8.268 HYPR 800 31.496	460 18.110 330 12.992 140 5.512	—	150 μm / ±3°	±10 %	IP67	-55 to +80 °C
		M4 	Tough (Bending durability) FD-40			STD 520 20.472 HYPR 1,550 61.024	900 35.433 740 29.134 260 10.236 90 3.543	STD 750 29.528 HYPR 1,750 68.898	1,300 51.151 970 38.189 420 16.535					
	Cylindrical	M6 	Tough (Bending durability) FD-60	R4		STD 160 6.299 HYPR 600 23.622	330 12.992 250 9.843 80 3.150 25 0.984	STD 220 8.661 HYPR 800 31.496	500 19.685 330 12.992 140 5.512					
		ø3 	Tough (Bending durability) FD-S30			STD 160 6.299 HYPR 600 23.622	330 12.992 250 9.843 80 3.150 25 0.984	STD 220 8.661 HYPR 800 31.496	500 19.685 330 12.992 140 5.512					

- Notes: 1) The fiber cable length practically limits the sensing range.
 2) The sensing range of reflective type is specified for white non-glossy paper.
 3) The **FX-550L** series does not have FAST mode.
 4) It is not a free-cut type.

Tough : Refer to a fiber which possesses both unbreakable (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°) and more flexible (bending radius: R4 mm **R0.157 in** or less) features.
Bending durability : Refer to a fiber which possesses unbreakable bending-resistant feature (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°).

LIST OF FIBERS

Threaded type

*Thru-beam type sensors are available as two pieces per set.

Type	Shape of fiber head (mm)	Model No.	Bending radius (mm)	Fiber cable length Free-cut	Sensing range (mm in) (Note 1, 3)				Beam axis dia. (mm)	Beam axis position / Inclination of beam axis	Protection	Ambient temp.		
					FX-500 series	Other modes	U-LG LONG FAST H-SP	FX-550 / FX-550L series					Other modes	U-LG LONG FAST
Thru-beam Threaded	M3	Tough (Bending durability) FT-31	R2	Free-cut	STD 315 12.402 HYPR 1,350 53.150	770 30.315 550 21.654 210 8.268 70 2.756	480 18.898 HYPR 1,580 62.205	1,000 39.370 700 27.559 290 11.417	ø0.5	150 µm / ±2°	IP67	-55 to +80 °C		
		FT-31W	R1		STD 260 10.236 HYPR 990 38.976	590 23.228 440 17.323 150 5.906 53 2.087	420 16.535 HYPR 1,300 51.181	890 35.039 580 22.835 250 9.843					150 µm / ±3°	-40 to +60 °C
		Tough (Bending durability) FT-32	R2		STD 3,000 118.110 HYPR (Note 2) 3,600 141.732	3,600 141.732 (Note 2) 3,600 141.732 (Note 2) 1,600 62.992 580 22.835	STD 3,600 141.732 (Note 2) HYPR 3,600 141.732 (Note 2)	3,600 141.732 (Note 2) 3,600 141.732 (Note 2) 2,900 114.173					ø1.6	—
	M4	Lens mountable FT-43	R4		STD 1,400 55.118 HYPR (Note 2) 3,600 141.732	2,800 110.236 2,100 82.677 770 30.315 240 9.449	STD 2,200 86.614 HYPR 3,600 141.732 (Note 2)	3,600 141.732 (Note 2) 3,100 122.047 1,400 55.118	ø1.5	150 µm / ±2°	IP67	-55 to +80 °C		
		Lens mountable FT-42	R1		STD 1,130 44.488 HYPR (Note 2) 3,600 141.732	2,050 80.709 1,600 62.992 530 20.866 190 7.480	STD 1,470 57.874 HYPR 3,600 141.732 (Note 2)	2,900 114.173 (Note 2) 2,100 82.677 890 35.039						
		Lens mountable FT-42W	R1		STD 800 31.496 HYPR (Note 2) 3,300 129.921	1,900 74.803 1,400 55.118 490 19.291 160 6.299	STD 1,200 47.244 HYPR 3,600 141.732 (Note 2)	2,600 102.362 (Note 2) 1,780 70.079 710 27.953						
		Lens mountable, Stainless-jacketed FT-45X	R4		STD 1,200 47.244 HYPR (Note 2) 1,600 62.992	1,600 62.992 (Note 2) 1,600 62.992 (Note 2) 630 24.803 200 7.874	STD 1,600 62.992 (Note 2) HYPR 1,600 62.992 (Note 2)	1,600 62.992 (Note 2) 1,600 62.992 (Note 2) 1,070 42.126						
	Elbow	Lens mountable FT-R40	R4		STD 930 36.614 HYPR (Note 2) 3,600 141.732	1,750 68.898 1,500 59.055 500 19.685 160 6.299	STD 1,400 55.118 HYPR 3,600 141.732 (Note 2)	2,900 114.173 1,950 76.772 860 33.858	ø1	150 µm / ±2°	IP67	-55 to +80 °C		
		With expansion lens FT-140	R4		STD 19,600 771.654 HYPR (Note 2) 19,600 771.654	19,600 771.654 (Note 2) 19,600 771.654 (Note 2) 16,000 629.921 6,300 248.031	STD 19,600 771.654 (Note 2) HYPR 19,600 771.654 (Note 2)	19,600 771.654 (Note 2) 19,600 771.654 (Note 2) 19,600 771.654 (Note 2)						
	M14 Long range	With expansion lens FT-140	R4		10 m	STD 19,600 771.654 HYPR (Note 2) 19,600 771.654	19,600 771.654 (Note 2) 19,600 771.654 (Note 2) 16,000 629.921 6,300 248.031	STD 19,600 771.654 (Note 2) HYPR 19,600 771.654 (Note 2)	19,600 771.654 (Note 2) 19,600 771.654 (Note 2) 19,600 771.654 (Note 2)	ø10	—	IP67	-40 to +70 °C	

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 fiber cable length practically limits the sensing range.
 3) The FX-550L series does not have FAST mode.

Tough : Refer to a fiber which possesses both unbreakable (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°) and more flexible (bending radius: R4 mm **R0.157 in** or less) features.
Bending durability : Refer to a fiber which possesses unbreakable bending-resistant feature (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°).

LIST OF FIBERS

Threaded type

Type	Shape of fiber head (mm)	Model No.	Bending radius (mm)	Fiber cable length Free-cut	Sensing range (mm in) (Note 1, 2, 3)				Beam axis position / Inclination of beam axis	Protection	Ambient temp.	
					FX-500 series	Other modes	U-LG LONG FAST H-SP	FX-550 / FX-550L series				Other modes
Reflective Threaded	M3	Tough (Bending durability) FD-31	R2	2 m	STD 125 4.921 HYPR 515 20.276	290 11.417 220 8.661 80 3.150 25 0.984	200 7.874 HYPR 750 29.528	450 17.717 310 12.205 140 5.512	150 μm ±3°	IP67	-55 to +80 °C	
		FD-31W	R1		STD 80 3.150 HYPR 330 12.992	180 7.087 140 5.512 45 1.772 12 0.472	130 5.118 HYPR 480 18.898	310 12.205 190 7.480 80 3.150			-40 to +60 °C	
		Tough (Bending durability) FD-32G	R2		STD 200 7.874 HYPR 650 25.591	380 14.961 270 10.630 95 3.740 27 1.063	STD 320 12.598 HYPR 1,150 45.278	730 28.740 420 16.535 170 6.693		-	IP40	-55 to +80 °C
		FD-32GX	R2		STD 200 7.874 HYPR 630 24.803	410 16.142 360 14.173 100 3.937 30 1.181	STD 320 12.598 HYPR 1,350 53.150	730 28.740 490 19.291 180 7.087				-55 to +80 °C
		Tough (Bending durability) FD-34G	R2		STD 90 3.543 HYPR 330 12.992	185 7.283 135 5.305 49 1.929 15 0.591	130 5.118 HYPR 480 18.898	310 12.205 180 7.087 80 3.150		-	IP40	-40 to +70 °C
		FD-EG30	R4		STD 48 1.890 HYPR 170 6.693	130 5.118 110 4.331 30 1.181 9 0.354	STD 90 3.543 HYPR 320 12.598	190 7.480 120 4.724 50 1.969				-20 to +60 °C
	Ultra-small diameter	FD-EG31	R4	500 mm	STD 20 0.787 HYPR 85 3.346	45 1.772 35 1.378 12 0.472 3.5 0.138	STD 35 1.378 HYPR 120 4.724	70 2.756 45 1.772 20 0.787	-20 to +60 °C			
		M4	Tough (Bending durability) FD-41	R2	2 m	STD 125 4.921 HYPR 515 20.276	290 11.417 220 8.661 80 3.150 25 0.984	200 7.874 HYPR 750 29.528	450 17.717 310 12.205 140 5.512	150 μm ±3°	IP67	-55 to +80 °C
	FD-41W		R1	STD 270 10.630 HYPR 900 35.433		630 24.803 430 16.929 150 5.906 45 1.772	STD 480 18.898 HYPR 1,400 55.118	1,000 39.370 680 26.772 270 10.630	-40 to +60 °C			
	Tough (Bending durability) FD-42G		R2	STD 200 7.874 HYPR 650 25.591		380 14.961 270 10.630 95 3.740 27 1.063	STD 320 12.598 HYPR 1,150 45.278	730 28.740 420 16.535 170 6.693	-	IP40	-55 to +80 °C	
	FD-42GW		R1	STD 150 5.906 HYPR 670 26.378		340 13.386 280 11.024 90 3.543 25 0.984	STD 210 8.268 HYPR 950 37.402	540 21.260 330 12.992 130 5.118			-40 to +60 °C	
	M6	FD-62	R4	2 m	STD 520 20.472 HYPR 1,500 59.055	1,000 39.370 940 37.008 340 13.386 110 4.331	STD 880 34.646 HYPR 1,950 76.772	1,450 57.087 1,140 44.882 550 21.654	150 μm ±3°	IP67	-55 to +80 °C	
		Tough (Bending durability) FD-61	R4	STD 450 17.717 HYPR 1,400 55.118	840 33.071 670 26.378 200 7.874 70 2.756	STD 620 24.409 HYPR 1,630 64.173	1,180 46.457 870 34.252 380 14.961	-55 to +80 °C				
		FD-61W	R1	STD 270 10.630 HYPR 900 35.433	630 24.803 430 16.929 150 5.906 45 1.772	STD 480 18.898 HYPR 1,400 55.118	1,000 39.370 680 26.772 270 10.630	-40 to +60 °C				
		Tough (Bending durability) FD-61G	R4	STD 420 16.535 HYPR 1,100 43.307	800 31.496 650 25.591 200 7.874 60 2.362	STD 600 23.622 HYPR 1,350 53.150	1,200 47.244 850 33.465 350 13.780	-	IP40	-55 to +80 °C		
		FD-64X	R4	1 m	STD 280 11.024 HYPR 670 26.378	500 19.685 410 16.142 160 6.299 50 1.969	STD 410 16.142 HYPR 1,200 47.244			700 27.559 590 23.228 230 9.055	-55 to +80 °C	
Elbow	Tough (Bending durability) FD-R60	R4	2 m	STD 290 11.417 HYPR 1,100 43.307	600 23.622 550 21.654 190 7.480 65 2.559	STD 500 19.685 HYPR 1,450 57.087	1,150 45.276 800 31.496 350 13.780	150 μm ±3°	IP67	-55 to +80 °C		

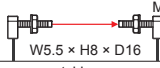
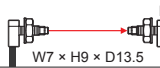
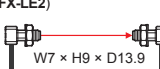
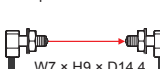
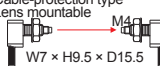
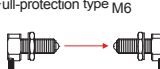
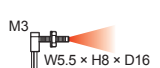
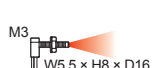
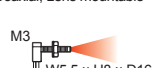
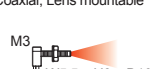

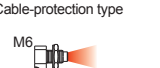
- Notes: 1) Note that the sensing range of the free-cut type fiber may be reduced by 20 % max. depending upon how the fiber is cut.
 2) The sensing range is specified for white non-glossy paper.
 3) The **FX-550L** series does not have FAST mode.
 4) The allowable cutting range is 700 mm **27.559 in** from the end that the amplifier inserted.

Tough : Refer to a fiber which possesses both unbreakable (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°) and more flexible (bending radius: R4 mm **R0.157 in** or less) features.
Bending durability : Refer to a fiber which possesses unbreakable bending-resistant feature (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°).

LIST OF FIBERS

Square head type

*Thru-beam type sensors are available as two pieces per set.

Type	Shape of fiber head (mm)	Model No.	Bending radius (mm)	Fiber cable length Free-cut	Sensing range (mm in) (Note 1, 3, 4)				Beam axis dia. (Fiber Core) (mm)	Protection	Ambient temp.
					FX-500 series	Other modes	U-LG LONG FAST H-SP	FX-550 / FX-550L series			
Thru-beam Square head	M3 	Tough (Bending durability) FT-R31	R2	2 m	STD 270 10.630 HYPR 1,000 39.370	580 22.835 440 17.323 160 6.299 55 2.165	STD 510 20.079 HYPR 1,670 65.748	1,120 44.094 700 27.559 310 12.205	∅0.5	IP67	-55 to +80 °C
	Lens mountable M4 	Tough (Bending durability) FT-R43	R4		STD 720 28.346 HYPR 3,000 118.110	1,600 62.992 1,100 43.307 430 16.929 130 5.118	STD 1,250 49.213 HYPR 3,600 141.732 (Note 2)	2,650 104.331 1,750 68.898 750 29.528	∅1	IP40	-40 to +60 °C
	Lens mountable (FX-LE2) M4 	FT-R41W	R1		STD 800 31.496 HYPR 3,200 125.984	1,800 70.866 1,400 55.118 460 18.110 150 5.906	STD 1,300 51.181 HYPR 3,600 141.732 (Note 2)	2,900 114.173 1,850 72.835 800 31.496	∅2.2		
	With expansion lens M4 	FT-R42W			STD 2,200 86.614 HYPR 3,600 141.732 (Note 2)	3,600 141.732 (Note 2) 3,500 137.795 1,300 51.181 460 18.110	STD 3,600 141.732 (Note 2) HYPR 3,600 141.732 (Note 2)	3,600 141.732 (Note 2) 3,600 141.732 (Note 2) 2,800 110.236			
	Oil-resistant Cable-protection type Lens mountable M4 	Tough (Bending durability) FT-R44Y	R4		STD 720 28.346 HYPR 3,000 118.110	1,600 62.992 1,100 43.307 430 16.929 130 5.118	STD 1,300 51.181 HYPR 3,600 141.732 (Note 2)	2,900 114.173 1,800 70.866 800 31.496	∅1	IP67 (Note 5)	-55 to +80 °C
	Oil-resistant Full-protection type M6 	Tough (Bending durability) FT-R60Y	R4		STD 2,100 82.677 HYPR 3,600 141.732 (Note 2)	3,600 141.732 (Note 2) 3,500 141.732 (Note 2) 1,260 49.606 400 15.748	STD 3,600 141.732 (Note 2) HYPR 3,600 141.732 (Note 2)	3,600 141.732 (Note 2) 3,600 141.732 (Note 2) 1,900 74.803	∅3.5	IP68G	-55 to +80 °C
Reflective Square head	M3 Coaxial, Lens mountable 	Tough (Bending durability) FD-R31G	R2	500mm	STD 170 6.693 HYPR 530 20.866	310 12.205 260 10.236 85 3.346 27 1.063	STD 290 11.417 HYPR 900 35.433	600 23.622 400 15.748 160 6.299	Emitter ∅0.5	IP40	-55 to +80 °C
	M3 Coaxial, Lens mountable 	FD-R32EG	R4		STD 45 1.772 HYPR 170 6.693	110 4.331 92 3.622 30 1.181 9 0.354	STD 80 3.150 HYPR 290 11.417	180 7.087 110 4.331 45 1.772	Emitter ∅0.25		-40 to +70 °C
	M3 Coaxial, Lens mountable 	FD-R34EG			STD 38 1.496 HYPR 130 5.118	90 3.543 70 2.756 23 0.906 7 0.276	STD 70 2.756 HYPR 250 9.843	140 5.512 90 3.543 40 1.575	Emitter ∅0.175	-20 to +60 °C	
	M3 Coaxial, Lens mountable 	FD-R33EG			STD 19 0.748 HYPR 84 3.307	44 1.732 33 1.299 11 0.433 3 0.118	STD 30 1.181 HYPR 110 4.331	65 2.559 40 1.575 18 0.709	Emitter ∅0.125		
	M4 Cable-protection type 	Tough (Bending durability) FD-R41			R2	STD 210 8.268 HYPR 710 27.953	430 16.929 320 12.598 100 3.937 34 1.339	STD 340 13.386 HYPR 1,150 45.276	750 29.528 450 17.716 190 7.480	∅0.75	IP67
	Oil-resistant Cable-protection type M6 	Tough (Bending durability) FD-R61Y	R4		STD 280 11.024 HYPR 990 38.976	610 24.016 435 17.126 160 6.299 50 1.969	STD 450 17.717 HYPR 1,350 53.150	1,000 39.370 650 25.591 250 9.843	—	IP67 (Note 5)	-55 to +80 °C

- 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 fiber cable length practically limits the sensing range.
 3) The FX-550L series does not have FAST mode.
 4) The sensing range of reflective type is specified for white non-glossy paper.
 5) The fiber part is oil-resistant.

Tough : Refer to a fiber which possesses both unbreakable (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°) and more flexible (bending radius: R4 mm **R0.157 in** or less) features.
Bending durability : Refer to a fiber which possesses unbreakable bending-resistant feature (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°).

LIST OF FIBERS

Cylindrical type

*Thru-beam type sensors are available as two pieces per set.

Type	Shape of fiber head (mm)	Model No.	Bending radius (mm)	Fiber cable length (m) : Free-cut	Sensing range (mm in) (Note 1, 3, 4)				Beam axis dia. (mm)	Beam axis position / Inclination of beam axis	Protection	Ambient temp.
					FX-500 series	Other modes	U-LG LONG FAST H-SP	FX-550 / FX-550L series				
Thru-beam Cylindrical		Tough (Bending durability) FT-S11	R2	500 mm	STD 90 3.543	210 8.268	STD 130 5.118	280 11.024	0.25	—	IP67	-55 to +80 °C
		HYPR 350 13.780			160 6.299	HYPR 180 7.867	180 7.867					
		Tough (Bending durability) FT-S21	R1	2 m	STD 315 12.402	770 30.315	STD 450 17.717	1,000 39.370	0.5	150 μm / ±2°	IP67	-40 to +60 °C
		HYPR 1,350 53.150			550 21.654	HYPR 670 26.378	670 26.378					
		FT-S21W	R1	2 m	STD 260 10.236	590 23.228	STD 400 15.748	850 33.465	0.5	150 μm / ±3°	IP67	-40 to +60 °C
		HYPR 990 38.976			440 17.323	HYPR 150 5.906	580 22.835					
		Tough (Bending durability) FT-S22	R10	2 m	STD 450 17.717	920 36.220	STD 870 34.252	1,900 74.803	0.7	—	IP40	-40 to +70 °C
		HYPR 1,500 59.055			730 28.740	HYPR 250 9.843	1,200 47.244					
		FT-S32	R10	2 m	STD 3,100 122.047	3,600 141.732 (Note 2)	STD 3,600 141.732 (Note 2)	3,600 141.732 (Note 2)	2	—	IP40	-40 to +70 °C
		HYPR (Note 2) 3,600 141.732			3,600 141.732 (Note 2)	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)					
	FT-S31W	R1	2 m	STD 800 31.496	1,900 74.803	STD 1,100 43.307	2,450 96.457	1	150 μm / ±3°	IP67	-40 to +60 °C	
	HYPR 3,300 129.921			1,400 55.118	HYPR 490 19.291	1,600 62.992						
Ultra-small diameter		Tough (Bending durability) FT-E13	R2	1 m	STD 15 0.591	30 1.181	STD 21 0.827	45 1.772	0.125	—	IP67	-40 to +70 °C
		HYPR 52 2.047			24 0.945	HYPR 8 0.315	30 1.181					
Ultra-small diameter		Tough (Bending durability) FT-E23	R2	1 m	STD 75 2.953	160 6.299	STD 120 4.724	250 9.843	0.25	—	IP67	-40 to +70 °C
		HYPR 270 10.630			125 4.921	HYPR 42 1.654	165 6.496					
Side-view		Tough (Bending durability) FT-V40	R4	2 m	STD 3,500 137.795	3,600 141.732 (Note 2)	STD 3,600 141.732 (Note 2)	3,600 141.732 (Note 2)	2.5	—	IP50	-40 to +60 °C
Reflective Cylindrical		Tough (Bending durability) FD-S21	R2	1 m	STD 80 3.150	130 5.118	STD 85 3.346	130 5.118	—	IP40	-55 to +80 °C	
		HYPR 190 7.480			110 4.331	HYPR 37 1.457	110 4.331					
		Tough (Bending durability) FD-S32	R4	2 m	STD 420 16.535	790 31.102	STD 600 23.622	1,200 42.244	150 μm / ±3°	IP67	-40 to +60 °C	
		HYPR 1,200 47.244			660 25.984	HYPR 220 8.661	900 35.433					
		FD-S32W	R1	2 m	STD 270 10.630	630 24.803	STD 450 17.717	1,000 39.370	150 μm / ±3°	IP67	-40 to +60 °C	
		HYPR 900 35.433			430 16.929	HYPR 150 5.906	650 25.991					
		Tough (Bending durability) FD-S31	R2	2 m	STD 125 4.921	290 11.417	STD 200 7.874	450 17.717	150 μm / ±3°	IP67	-55 to +80 °C	
		HYPR 515 20.276			220 8.661	HYPR 80 3.150	300 11.811					
	FD-S33GW	R1	2 m	STD 150 5.906	340 13.386	STD 240 9.449	550 21.654	150 μm / ±3°	IP67	-40 to +60 °C		
	HYPR 670 26.378			280 11.024	HYPR 90 3.543	370 14.567						
	Tough (Bending durability) FD-S34G	R2	2 m	STD 90 3.543	185 7.283	STD 130 5.118	310 12.205	150 μm / ±3°	IP67	-40 to +70 °C		
	HYPR 330 12.992			135 5.305	HYPR 49 1.929	180 7.187						
Ultra-small diameter		FD-E13	R4	1 m	STD 12 0.472	29 1.142	STD 23 0.906	50 1.969	150 μm / ±3°	IP40	-40 to +60 °C	
		HYPR 150 1.969			25 0.984	HYPR 7 0.276	30 1.181					
Ultra-small diameter		FD-E23	R4	1 m	STD 55 2.165	120 4.724	STD 80 3.150	170 6.693	150 μm / ±3°	IP40	-40 to +70 °C	
		HYPR 170 6.693			80 3.150	HYPR 30 1.181	105 4.134					

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 fiber cable length practically limits the sensing range.
 3) The FX-550L series does not have FAST mode.
 4) The sensing range of reflective type is specified for white non-glossy paper.

Tough : Refer to a fiber which possesses both unbreakable (bending radius: R10 mm R0.394 in, reciprocating bending: 180°) and more flexible (bending radius: R4 mm R0.157 in or less) features.
Bending durability : Refer to a fiber which possesses unbreakable bending-resistant feature (bending radius: R10 mm R0.394 in, reciprocating bending: 180°).

LIST OF FIBERS

Sleeve type

*Thru-beam type sensors are available as two pieces per set.

Type	Shape of fiber head (mm)	Model No.	Bending radius (mm)	Fiber cable length (m): Free-cut	Sensing range (mm in) (Note 1, 4, 5)				Beam axis dia. (mm)	Protection	Ambient temp.		
					FX-500 series		FX-550 / FX-550L series						
Thru-beam	Threaded	M3 Sleeve 40mm ø0.88 10	Tough (Bending durability) FT-31S	R2 (Note 2)	2 m	STD 315 12.402 HYPR 1,220 48.031	740 29.134 550 21.654 195 7.677 63 2.480	STD 480 18.898 HYPR 1,580 62.205	1,000 39.370 700 27.559 290 11.417	ø0.5	IP67	-55 to +80 °C	
		M4 Sleeve 40mm ø1.48 12	Tough (Bending durability) FT-42S	R4 (Note 2)	2 m	STD 1,130 44.488 HYPR (Note 3) 3,600 141.732	2,050 80.709 1,600 62.992 530 20.866 190 7.480	STD 1,470 57.874 HYPR 3,600 141.732 (Note 3)	2,900 114.173 2,100 82.677 890 35.039	ø1			
	Cylindrical	Ultra-small diameter	ø3 Narrow beam ø0.125mm ø0.25 ø3 Sleeve part cannot be bent.	Tough (Bending durability) FT-E13	R2	1 m	STD 15 0.591 HYPR 152 2.047	30 1.181 24 0.945 8 0.315 2 0.079	STD 21 0.827 HYPR 68 2.677	45 1.772 30 1.181 12 0.472	ø0.125	IP67	-40 to +70 °C
			ø3 Narrow beam ø0.25mm ø0.4 ø3 Sleeve part cannot be bent.	Tough (Bending durability) FT-E23	R2	1 m	STD 75 2.953 HYPR 270 10.630	160 6.299 125 4.921 42 1.654 13 0.512	STD 120 4.724 HYPR 355 13.976	250 9.843 165 6.496 70 2.756	ø0.25		
		Side-view	ø2 Sleeve part cannot be bent.	Tough (Bending durability) FT-V23	R4	2 m	STD 450 17.717 HYPR 1,800 70.866	1,000 39.370 880 34.646 280 11.024 90 3.543	STD 750 29.528 HYPR 2,400 94.488	1,600 62.992 1,050 41.339 450 17.717	ø0.75	IP30	-55 to +80 °C
			ø2 Sleeve part cannot be bent.	Tough (Bending durability) FT-V25	R2		STD 240 9.449 HYPR 900 35.433	550 21.654 480 18.898 140 5.512 45 1.772	STD 450 17.717 HYPR 1,400 55.118	950 37.402 630 24.803 280 11.024			
	Side-view	ø2.5 Sleeve part cannot be bent.	Tough (Bending durability) FT-V24W	R1	2 m	STD 110 4.331 HYPR 380 14.961	230 9.055 200 7.874 60 2.362 20 0.787	STD 160 6.299 HYPR 500 19.685	350 13.780 220 8.661 95 3.740	ø0.5	IP30	-40 to +60 °C	
		ø2.5 Sleeve part cannot be bent.	Tough (Bending durability) FT-V30	R4		STD 680 26.772 HYPR 2,200 86.614	1,200 47.244 1,000 39.370 340 13.386 100 3.937	STD 950 37.402 HYPR 3,600 141.732 (Note 3)	1,950 76.772 1,300 51.181 550 21.654	ø1.0			
	Reflective	Threaded	Ultra-small diameter M3 Sleeve 15 mm ø0.8 15	FD-EG30S	R4	1 m	STD 50 1.969 HYPR 170 6.693	110 4.331 80 3.150 30 1.181 9 0.354	STD 90 3.543 HYPR 320 12.598	190 7.480 120 4.724 50 1.969	IP40	-40 to +70 °C	
			M4 Sleeve 40 mm ø1.48 12	FD-41S	R2 (Note 2)	2 m	STD 125 4.921 HYPR 515 20.276	290 11.417 220 8.661 80 3.150 25 0.984	STD 200 7.874 HYPR 750 29.528	450 17.717 310 12.205 140 5.512	IP67	-55 to +80 °C	
M4 Sleeve 40 mm ø1.48 12			FD-41SW	R1 (Note 2)	STD 80 3.150 HYPR 330 12.992		180 7.087 140 5.512 45 1.772 12 0.472	STD 130 5.118 HYPR 480 18.898	310 12.205 190 7.480 80 3.150	IP67	-40 to +60 °C		
M6 Sleeve 40 mm ø2.5 15			FD-61S	R4 (Note 2)	2 m	STD 420 16.535 HYPR 1,200 47.244	790 31.102 680 25.984 220 8.661 75 2.953	STD 650 25.591 HYPR 1,900 74.803	1,300 51.181 900 35.433 400 15.748	IP67	-55 to +80 °C		
Cylindrical		Ultra-small diameter	ø1.5 Sleeve part cannot be bent.	FD-E13	R4	1 m	STD 12 0.472 HYPR 50 1.969	29 1.142 25 0.984 7 0.276 2 0.079	STD 23 0.906 HYPR 75 2.953	50 1.969 30 1.181 12 0.472	IP40	-40 to +60 °C	
			ø3 Sleeve part cannot be bent.	FD-E23	R4	1 m	STD 55 2.165 HYPR 170 6.693	120 4.724 80 3.150 30 1.181 9 0.354	STD 80 3.150 HYPR 290 11.417	170 6.693 105 4.134 45 1.772	IP40	-40 to +70 °C	
		Side-view	ø3 Sleeve part cannot be bent.	FD-V30	R2	2 m	STD 65 2.559 HYPR 240 9.449	130 5.118 120 4.724 35 1.378 14 0.551	STD 90 3.243 HYPR 430 16.929	210 8.268 145 5.709 65 2.559	IP30	-55 to +80 °C	
			ø3 Sleeve part cannot be bent.	FD-V30W	R1		STD 20 0.787 HYPR 80 3.150	40 1.575 30 1.181 10 0.394 2 0.079	STD 30 1.181 HYPR 120 4.724	65 2.559 37 1.457 16 0.630	IP30	-40 to +60 °C	
		Side-view	ø5 Sleeve part cannot be bent.	FD-V50	R4	2 m	STD 120 4.724 HYPR 370 14.567	220 8.661 210 8.268 75 2.953 25 0.984	STD 180 7.087 HYPR 530 20.866	400 15.748 240 9.449 110 4.331	IP30	-55 to +80 °C	

- 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) Bending radius of sleeve part is R10 mm R0.394 in or more.
 3) The fiber cable length practically limits the sensing range.
 4) The FX-550L series does not have FAST mode.
 5) The sensing range of reflective type is specified for white non-glossy paper.

Tough : Refer to a fiber which possesses both unbreakable (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°) and more flexible (bending radius: R4 mm **R0.157 in** or less) features.
Bending durability : Refer to a fiber which possesses unbreakable bending-resistant feature (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°).

LIST OF FIBERS

Flat type

*Thru-beam type sensors are available as two pieces per set.

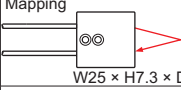
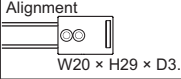
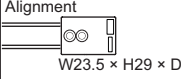
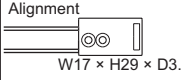
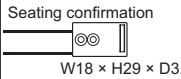
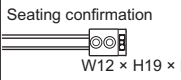
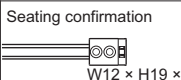
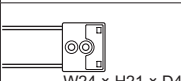
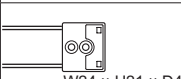
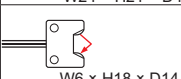
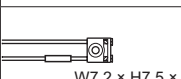
Type	Shape of fiber head (mm)	Model No.	Bending radius (mm)	Fiber cable length Free-cut	Sensing range (mm in) (Note 1, 3, 4)				Beam axis dia. (mm)	Protection	Ambient temp.			
					FX-500 series	Other modes	U-LG LONG FAST H-SP	FX-550 / FX-550L series				Other modes	U-LG LONG FAST	
Thru-beam	Flat	Top sensing W3 × H8 × D12 Tough (Bending durability)	R2	2 m	STD 3,500 137.795	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)	STD 3,600 141.732 (Note 2)	2 × 3	IP40	-40 to +60 °C			
		FT-Z30H	HYPR (Note 2) 3,600 141.732		2,600 102.362	810 31.890	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)						
	Top sensing W3 × H8 × D12	R1	FT-Z30HW		STD 3,500 137.795	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)	STD 3,600 141.732 (Note 2)						
	FT-Z30HE	HYPR (Note 2) 3,600 141.732	2,400 94.488		740 29.134	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)							
	Side sensing W3 × H12 × D8 Tough (Bending durability)	R2	FT-Z30E		STD 3,400 133.858	3,600 141.732 (Note 2)	2,000 78.740	630 24.803				3,600 141.732 (Note 2)	3,600 141.732 (Note 2)	
	FT-Z30EW	HYPR (Note 2) 3,600 141.732	3,600 141.732 (Note 2)		3,600 141.732 (Note 2)	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)							
	Side sensing W3 × H12 × D8	R1	FT-Z30E		STD 2,100 82.677	3,600 141.732 (Note 2)	1,200 47.244	410 16.142				3,600 141.732 (Note 2)	3,600 141.732 (Note 2)	
	FT-Z30	HYPR (Note 2) 3,600 141.732	3,600 141.732 (Note 2)		3,600 141.732 (Note 2)	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)							
	Front sensing W8.5 × H12 × D3 Tough (Bending durability)	R2	FT-Z30W		STD 1,500 59.055	3,300 129.921	3,200 125.984	1,000 39.370				280 11.024	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)
	FT-Z30W	HYPR (Note 2) 3,600 141.732	3,600 141.732 (Note 2)		3,600 141.732 (Note 2)	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)							
With boss	Front sensing W10 × H7 × D2	R1	FT-Z20W	STD 620 24.409	1,500 59.055	1,100 43.307	420 16.535	130 5.118	1,600 62.992 (Note 2)	650 25.591	1,600 62.992 (Note 2)			
	FT-Z20WB	HYPR (Note 2) 1,600 62.992	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)									
	Fiber guide type W2 × H10 × D10	R1	FT-Z20HBW	STD 260 10.236	670 26.378	570 22.441	180 7.087	55 2.165	1,000 39.370	650 25.591	280 11.024			
	FT-Z20HBW	HYPR (Note 2) 1,100 43.307	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)									
	Front sensing W14 × H7 × D3.5	R1	FT-Z40W	STD 1,500 59.055	3,300 129.921	2,300 90.551	900 35.433	290 11.417	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)				
	FT-Z40WB	HYPR (Note 2) 3,600 141.732	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)									
Fiber guide type W3.5 × H14 × D11	R1	FT-Z40HBW	STD 800 31.496	1,900 74.803	1,400 55.118	490 19.291	160 6.299	3,600 141.732 (Note 2)	2,700 106.299	1,850 72.835	750 29.528			
FT-Z40HBW	HYPR (Note 2) 3,300 129.921	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)										
Chemical-resistant	Easy mounting, Rectangular head SEMI S2 compliant Metal-free W7 × H15 × D13 Tough (Bending durability)	R4	FT-Z802Y	STD 3,100 122.047	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)				
FT-Z802Y	HYPR (Note 2) 3,600 141.732	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)										
Reflective	Flat	Front sensing W10 × H7 × D2	R1	FD-Z20W	STD 1 to 65 0.039 to 2.559	150 5.906	130 5.118	290 11.417	IP40	-40 to +60 °C				
		FD-Z20WB	HYPR 260 10.236	2 to 45 0.079 to 1.772	5 to 13 0.197 to 0.512	450 17.717	190 7.480	80 3.150						
	Fiber guide type W2 × H10 × D10	R1	FD-Z20HBW	STD 2 to 85 0.079 to 3.346	1 to 210 0.039 to 8.268	1 to 180 0.039 to 7.087	2 to 55 0.079 to 2.165	3 to 15 0.118 to 0.591	370 14.567		240 9.449	100 3.937		
	FD-Z20HBW	HYPR 1 to 340 0.039 to 13.386	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)									
	Front sensing W14 × H7 × D3.5	R1	FD-Z40W	STD 190 7.480	440 17.323	390 15.354	1 to 120 0.039 to 4.724	2 to 35 0.079 to 1.378	950 37.402		510 20.079	230 9.055		
FD-Z40WB	HYPR 790 31.102	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)										
Fiber guide type W3.5 × H14 × D11	R1	FD-Z40HBW	STD 260 10.236	540 21.260	470 18.504	1 to 160 0.039 to 6.299	2 to 50 0.079 to 1.969	1,000 39.370	680 26.772	270 10.630				
FD-Z40HBW	HYPR 760 29.921	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)	3,600 141.732 (Note 2)										

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 fiber cable length practically limits the sensing range.
 3) The **FX-550L** series does not have FAST mode.
 4) The sensing range of reflective type is specified for white non-glossy paper.

Tough : Refer to a fiber which possesses both unbreakable (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°) and more flexible (bending radius: R4 mm **R0.157 in** or less) features.
Bending durability : Refer to a fiber which possesses unbreakable bending-resistant feature (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°).

LIST OF FIBERS

Convergent reflective type

Type	Shape of fiber head (mm)	Model No.	Bending radius (mm)	Fiber cable length Free-cut	Sensing range (mm in) (Note 1, 2, 3)				Protection	Ambient temp.
					FX-500 series	Other modes	U-LG LONG FAST H-SP	FX-550 / FX-550L series		
Convergent reflective	Glass substrate detection	 Mapping W25 × H7.3 × D30 FD-L32H (Bending durability)	R4	4 m	STD 0 to 56 0 to 2.205 HYPR 0 to 110 0 to 4.331	0 to 87 0 to 3.425 0 to 74 0 to 2.913 1 to 38 0.039 to 1.496 Cannot use	STD 0 to 65 0 to 2.559 HYPR 0 to 100 0 to 3.397	0 to 90 0 to 3.543 0 to 75 0 to 2.953 0 to 50 0 to 1.969	IP40	-40 to +60 °C
		 Alignment W20 × H29 × D3.8 FD-L30A (Tough Bending durability)	R2	3 m	STD 0 to 43 0 to 1.693 HYPR 0 to 43 0 to 1.693	0 to 43 0 to 1.693 0 to 43 0 to 1.693 0 to 42 0 to 1.654 0 to 29 0 to 1.142	STD 0 to 52 0 to 2.047 HYPR 0 to 72 0 to 2.835	0 to 68 0 to 2.677 0 to 62 0 to 2.441 0 to 46 0 to 1.811		
		 Alignment W23.5 × H29 × D4.5 FD-L31A (Tough Bending durability)	R4	3 m	STD 4 to 33 0.157 to 1.299 HYPR 3 to 35 0.118 to 1.378	4 to 33 0.157 to 1.299 4 to 33 0.157 to 1.299 4 to 32 0.157 to 1.260 5 to 25 0.197 to 0.984	STD 3 to 42 0.118 to 1.654 HYPR 0 to 50 0 to 1.967	2 to 43 0.079 to 1.693 3 to 42 0.118 to 1.654 3 to 40 0.118 to 1.575		
		 Alignment W17 × H29 × D3.8 FD-L22A (Tough Bending durability)	R2	2 m	STD 0 to 24 0 to 0.945 HYPR 0 to 31 0 to 1.220	0 to 28 0 to 1.102 0 to 27 0 to 1.063 0 to 24 0 to 0.945 0 to 18 0 to 0.709	STD 0 to 34 0 to 1.339 HYPR 0 to 35 0 to 1.378	0 to 35 0 to 1.378 0 to 35 0 to 1.378 0 to 32 0 to 1.260		
		 Seating confirmation W18 × H29 × D3.8 FD-L23 (Tough Bending durability)	R2	3 m	STD 0 to 29 0 to 1.142 HYPR 0 to 30 0 to 1.181	0 to 30 0 to 1.181 0 to 30 0 to 1.181 0 to 28 0 to 1.102 1.5 to 24 0.059 to 0.945	STD 0 to 34 0 to 1.339 HYPR 0 to 34 0 to 1.339	0 to 34 0 to 1.339 0 to 34 0 to 1.339 0 to 32 0 to 1.260		
		 Seating confirmation W12 × H19 × D3 FD-L11 (Tough Bending durability)	R4	3 m	STD 0 to 9.5 0 to 0.374 HYPR 0 to 11.5 0 to 0.453	0 to 10.5 0 to 0.413 0 to 10 0 to 0.394 0 to 9 0 to 0.354 0 to 8 0 to 0.315	STD 0 to 13 0 to 0.512 HYPR 0 to 14 0 to 0.551	0 to 13 0 to 0.512 0 to 13 0 to 0.512 0 to 12 0 to 0.472		
		 Seating confirmation W12 × H19 × D3 FD-L10 (Tough Bending durability)	R4	3 m	STD 0 to 5 0 to 0.197 HYPR 0 to 6 0 to 0.236	0 to 5.5 0 to 0.217 0 to 5.5 0 to 0.217 0 to 4.5 0 to 0.177 0 to 4 0 to 0.157	STD 0 to 5 0 to 0.197 HYPR 0 to 6 0 to 0.236	0 to 5.5 0 to 0.217 0 to 5.5 0 to 0.217 0 to 5 0 to 0.197		
		 Seating confirmation W24 × H21 × D4 FD-L21 (Tough Bending durability)	R2	2 m	STD 1.5 to 16 0.059 to 0.630 HYPR 1.5 to 19 0.039 to 0.748	1 to 18 0.039 to 0.709 1 to 18 0.039 to 0.709 2 to 15 0.079 to 0.591 3 to 12 0.118 to 0.472	STD 1 to 19 0.039 to 0.748 HYPR 1 to 20 0.039 to 0.787	1 to 20 0.039 to 0.787 1 to 19 0.039 to 0.748 2 to 18 0.079 to 0.709		
		 Seating confirmation W24 × H21 × D4 FD-L21W (R1)	R1	2 m	STD 3 to 14 0.118 to 0.551 HYPR 1.5 to 15 0.059 to 0.591	2 to 15 0.079 to 0.591 2 to 15 0.079 to 0.591 4 to 14 0.157 to 0.551 6.5 to 10 0.256 to 0.394	STD 2 to 18 0.079 to 0.709 HYPR 1 to 19 0.039 to 0.748	1 to 19 0.039 to 0.748 2 to 18 0.079 to 0.709 3 to 17 0.118 to 0.669		
		 General purpose W6 × H18 × D14 FD-L20H (Tough Bending durability)	R2	3 m	STD 0 to 23 0 to 0.906 HYPR 0 to 45 0 to 1.772	0 to 35 0 to 1.378 0 to 32 0 to 1.260 2 to 15 0.079 to 0.591 5 to 9 0.197 to 0.354	STD 0 to 33 0 to 1.229 HYPR 0 to 65 0 to 2.559	0 to 50 0 to 1.969 0 to 40 0 to 1.575 0 to 25 0 to 0.984		
 Ultra-small W7.2 × H7.5 × D2 FD-L12W (R1)	R1	1 m	STD 0 to 8 0 to 0.315 HYPR 0 to 14 0 to 0.551	0 to 12.5 0 to 0.492 0 to 12 0 to 0.472 0.5 to 7 0.020 to 0.276 0.5 to 4 0.020 to 0.157	STD 0 to 12 0 to 0.472 HYPR 0 to 17 0 to 0.669	0 to 16 0 to 0.630 0 to 15 0 to 0.591 0 to 10 0 to 0.394	IP30	-40 to +60 °C		

- 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 transparent glass 100 × 100 × t0.7 mm 3.937 × 3.937 × t0.028 in (FD-L32H: R edge, FD-L21 and FD-L21W: t2 mm t0.079 in) (FD-L20H: white non-glossy paper, FD-L10: silicon wafers 100 × 100 mm 3.937 × 3.937 in).
 3) The FX-550L series does not have FAST mode.

Tough : Refer to a fiber which possesses both unbreakable (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°) and more flexible (bending radius: R4 mm **R0.157 in** or less) features.
Bending durability : Refer to a fiber which possesses unbreakable bending-resistant feature (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°).

LIST OF FIBERS

Small spot

Reflective type fiber & spot lens

Designation	Shape of head (mm)	Spot diameter (mm in) (Note 1)	Sensing range (mm in) (Note 1)	Lens		Applicable fibers					
				Model No.	Ambient temp.	Model No.	Fiber cable length ✂: Free-cut (Note 2)	Bending radius (mm)	Protection	Ambient temp.	
Finest spot lens		ø0.1 ø 0.004 approx.	Distance to focal point 7 ±0.5 0.276 ±0.020	FX-MR7	-55 to +70 °C	FD-R33EG	500 mm	R4	IP40		
						FD-EG31					
		FD-R34EG									
		FD-R32EG									
		FD-EG30				✂	2 m	Tough Bending durability FD-R31G			R2
		Tough Bending durability FD-42G						R1			
		FD-42GW						R2			
		Tough Bending durability FD-32G						R2			
		ø0.15 ø 0.006 approx.				FD-32GX	✂ 1 m (Note 3)				
						ø0.2 ø 0.008 approx.					
		ø0.1 ø 0.004 approx.	Distance to focal point 7 ±0.5 0.276 ±0.020	FX-MR6	-20 to +60 °C	FD-R33EG	500mm	R4			
						FD-EG31					
		FD-R34EG									
		FD-R32EG									
		FD-EG30				✂	2m	Tough Bending durability FD-R31G			R2
		Tough Bending durability FD-42G						R1			
		FD-42GW						R2			
		Tough Bending durability FD-32G						R2			
		ø0.15 ø 0.006 approx.				FD-32GX	✂ 1m (Note 3)				
						ø0.2 ø 0.008 approx.					
	ø0.4 ø 0.016 approx.										

Notes: 1) Spot diameter, sensing range and distance to focal point are specified for **FX-500 / FX-550 / FX-550L** series.
 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 allowable cutting range is 700 mm **27.559 in** from the end that the amplifier inserted.

Tough : Refer to a fiber which possesses both unbreakable (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°) and more flexible (bending radius: R4 mm **R0.157 in** or less) features.
Bending durability : Refer to a fiber which possesses unbreakable bending-resistant feature (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°).

LIST OF FIBERS

Small spot

Reflective type fiber & spot lens

Designation	Shape of head (mm)	Spot diameter (mm in) (Note 1)	Sensing range (mm in) (Note 1)	Lens		Applicable fibers					
				Model No.	Ambient temp.	Model No.	Fiber cable length : Free-cut (Note 2)	Bending radius (mm)	Protection	Ambient temp.	
Finest spot lens		ø0.15 ø0.006 approx.	Distance to focal point 7.5 ±0.5 0.295 ±0.020	FX-MR3	-40 to +70 °C	FD-R33EG	500mm	R4	IP40	-20 to +60 °C	
						FD-EG31					
		FD-R34EG									
		FD-R32EG									
		ø0.2 ø0.008 approx.				FD-EG30	2m	R2			-40 to +70 °C
						Tough FD-R31G					
		ø0.3 ø0.012 approx.				Tough FD-42G	2m	R1			-55 to +80 °C
						Tough FD-42GW					
	ø0.5 ø0.020 approx.	Tough FD-32G	1m (Note 3)	R2	-40 to +60 °C						
		Tough FD-32GX									
Zoom lens		ø0.4 to ø2.0 ø0.016 to ø0.079 approx.	10 to 30 0.394 to 1.181	FX-MR8	-55 to +70 °C	FD-R33EG	500 mm	R4	IP40	-20 to +60 °C	
						FD-EG31					
		FD-R34EG									
		FD-R32EG									
		ø0.4 to ø2.2 ø0.016 to ø0.087 approx.				FD-EG30	2 m	R2			-40 to +70 °C
						Tough FD-R31G					
		ø0.5 to ø2.5 ø0.020 to ø0.098 approx.				Tough FD-32G	1 m (Note 3)	R2			-55 to +80 °C
						Tough FD-32GX					
	ø0.8 to ø3.5 ø0.031 to ø0.138 approx.										

Notes: 1) Spot diameter, sensing range and distance to focal point are specified for FX-500 / FX-550 / FX-550L series.
 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 allowable cutting range is 700 mm **27.559 in** from the end that the amplifier inserted.

Tough : Refer to a fiber which possesses both unbreakable (bending radius: R10 mm [R0.394 in](#), reciprocating bending: 180°) and more flexible (bending radius: R4 mm [R0.157 in](#) or less) features.
Bending durability : Refer to a fiber which possesses unbreakable bending-resistant feature (bending radius: R10 mm [R0.394 in](#), reciprocating bending: 180°).

LIST OF FIBERS

Small spot

Reflective type fiber & spot lens

Designation	Shape of head (mm)	Spot diameter (mm in) (Note 1)	Sensing range (mm in) (Note 1)	Lens		Applicable fibers								
				Model No.	Ambient temp.	Model No.	Fiber cable length : Free-cut (Note 2)	Bending radius (mm)	Protection	Ambient temp.				
Parallel light lens		ø4 ø0.157 approx.	0 to 30 0 to 1.181	FX-MR9	-55 to +70 °C	FD-R33EG	500 mm	R4	IP40		-20 to +60 °C			
						FD-EG31								
						FD-R34EG								
						FD-R32EG								
						FD-EG30								
						Tough Bending durability FD-R31G	2 m	R2				-55 to +80 °C		
						Tough Bending durability FD-42G		R1					-40 to +60 °C	
						FD-42GW								
						Tough Bending durability FD-32G		R2						-55 to +80 °C
						FD-32GX		1 m (Note 3)						
Pinpoint spot lens		ø0.5 ø0.020	Distance to focal point 6 ±1 0.236 ±0.039	FX-MR1	-40 to +70 °C	Tough Bending durability FD-42G		R2		-55 to +80 °C				
						FD-42GW		R1			-40 to +60 °C			
Zoom lens		ø0.7 to ø2.0 ø0.028 to ø0.079 approx.	Distance to focal point 18.5 to 43 0.728 to 1.693 approx.	FX-MR2	-40 to +70 °C	Tough Bending durability FD-42G	2 m	R2		-55 to +80 °C				
						FD-42GW		R1			-40 to +60 °C			
Zoom lens (Side-view type)		ø0.5 to ø3.0 ø0.020 to ø0.118 approx.	Distance to focal point 13 to 30 0.512 to 1.181 approx.	FX-MR5	-40 to +60 °C	Tough Bending durability FD-42G		R2		-55 to +80 °C				
						FD-42GW		R1			-40 to +60 °C			

Notes: 1) Spot diameter, sensing range and distance to focal point are specified for FX-500 / FX-550 / FX-550L series.
 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 allowable cutting range is 700 mm [27.559 in](#) from the end that the amplifier inserted.

Tough : Refer to a fiber which possesses both unbreakable (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°) and more flexible (bending radius: R4 mm **R0.157 in** or less) features.
Bending durability : Refer to a fiber which possesses unbreakable bending-resistant feature (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°).

LIST OF FIBERS

Narrow beam

*Thru-beam type sensors are available as two pieces per set.

Type	Shape of fiber head (mm)	Model No.	Bending radius (mm)	Fiber cable length (m): Free-cut	Sensing range (mm in) (Note 1, 3, 4, 5)				Beam axis dia. (mm)	Inclination of beam axis	Protection	Ambient temp.
					FX-500 series		FX-550 / FX-550L series					
Thru-beam Narrow beam Side-view	Aperture angle 2° 	Tough (Bending durability) FT-KS40	R2	2 m	STD (Note 2) 3,600 141.732	3,600 141.732 (Note 2)	STD 3,600 141.732 (Note 2)	3,600 141.732 (Note 2)	ø2.2	—	IP40	-40 to +80 °C
		Tough (Bending durability) FT-KV40			HYPR (Note 2) 3,600 141.732	1,200 47.244	HYPR 3,600 141.732 (Note 2)	3,600 141.732 (Note 2)				
	Aperture angle 2° ø4 	Tough (Bending durability) FT-KV40W			STD (Note 2) 3,600 141.732	3,600 141.732 (Note 2)	STD 3,600 141.732 (Note 2)	3,600 141.732 (Note 2)				
	Aperture angle 2° ø4 	Tough (Bending durability) FT-KV26			HYPR (Note 2) 3,600 141.732	1,200 47.244	HYPR 3,600 141.732 (Note 2)	3,600 141.732 (Note 2)				
	Aperture angle 3° 1.5 x 2 	Tough (Bending durability) FT-KV26H1			STD (Note 2) 3,600 141.732	3,600 141.732 (Note 2)	STD 3,600 141.732 (Note 2)	3,600 141.732 (Note 2)				
Aperture angle 3° 1.5 x 2 	Tough (Bending durability) FT-KV26H1	HYPR (Note 2) 3,600 141.732	940 37.008	HYPR 3,600 141.732 (Note 2)	3,600 141.732 (Note 2)							
Retroreflective Ultra-narrow beam Top sensing	W5.2 x H9.5 x D16 	FR-Z50HW	R1	2 m	STD 100 to 990 3.937 to 38.976	100 to 1,400 3.937 to 55.118	STD 100 to 1,150 3.937 to 45.278	100 to 1,800 3.937 to 70.866	—	—	IP40	-25 to +55 °C
	W7.5 x H2.2 x D11.2 Aperture angle 3° (emitter) 	Tough (Bending durability) FR-KZ22E	HYPR 100 to 1,900 3.937 to 74.803		100 to 780 3.937 to 30.709	HYPR 100 to 2,250 3.937 to 88.583	100 to 1,400 3.937 to 55.118					
	W5.2 x H9.5 x D21 	Tough (Bending durability) FR-KZ50H	STD 15 to 310 0.591 to 12.205		15 to 460 0.591 to 18.110	STD 15 to 540 0.591 to 21.260	15 to 700 0.591 to 27.559					
	W9.5 x H25 x D5.2 	Tough (Bending durability) FR-KZ50E	HYPR 15 to 570 0.591 to 22.441		15 to 220 0.591 to 8.661	HYPR 15 to 800 0.591 to 31.496	15 to 600 0.591 to 23.622					
	W10.6 x H28 x D10.1 	Tough (Bending durability) FR-KZ50E	STD 20 to 300 0.787 to 11.811		20 to 400 0.787 to 15.748	STD 20 to 400 0.787 to 15.748	20 to 1,300 0.787 to 51.181					
W9.5 x H25 x D5.2 	Tough (Bending durability) FR-KZ50E	HYPR 20 to 1,000 0.787 to 39.370	20 to 200 0.787 to 7.874	HYPR 20 to 1,600 0.787 to 62.992	20 to 500 0.787 to 19.685							
Reflective Long range	W5.2 x H9.5 x D16 	FD-Z50HW	R1	2 m	STD 10 to 650 0.394 to 25.591	10 to 1,100 0.394 to 43.307	STD 10 to 950 0.394 to 37.402	10 to 2,100 0.394 to 82.677	—	—	IP40	-40 to +60 °C
		FD-Z50HW	HYPR 10 to 2,500 0.394 to 98.425		10 to 1,000 0.394 to 39.370	HYPR 10 to 3,700 0.394 to 154.669	10 to 590 0.394 to 23.228					

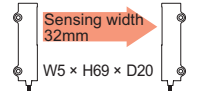
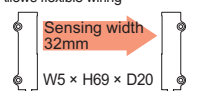
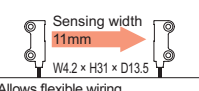
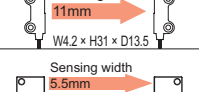

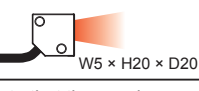
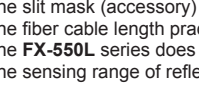
- Notes: 1) Note that the sensing range of the free-cut type fiber may be reduced by 20 % max. depending upon how the fiber is cut.
 2) The fiber cable length practically limits the sensing range.
 3) The **FX-550L** series does not have FAST mode.
 4) The sensing range of retroreflective type is the possible setting range for the attached reflector. The fiber can detect an object less than setting range for the reflector. Refer to the next page for the sensing range when **FR-Z50HW** is used in combination with a reflector (optional).
 5) The sensing range of reflective type is specified for white non-glossy paper.

Tough : Refer to a fiber which possesses both unbreakable (bending radius: R10 mm [R0.394 in](#), reciprocating bending: 180°) and more flexible (bending radius: R4 mm [R0.157 in](#) or less) features.
Bending durability : Refer to a fiber which possesses unbreakable bending-resistant feature (bending radius: R10 mm [R0.394 in](#), reciprocating bending: 180°).

LIST OF FIBERS

Wide beam

*Thru-beam type sensors are available as two pieces per set.

Type	Shape of fiber head (mm)	Model No.	Bending radius (mm)	Fiber cable length Free-cut	Sensing range (mm in) (Note 1, 4, 5)				Beam axis dia. (mm)	Protection	Ambient temp.	
					FX-500 series	Other modes	U-LG LONG FAST H-SP	FX-550 / FX-550L series				Other modes
Thru-beam	Wide beam 	Tough (Bending durability) FT-A32 (Note 2)	R2	2 m	STD (Note 3) 3,600 141.732	3,600 141.732 (Note 3)	U-LG LONG FAST H-SP	STD (Note 3) 3,600 141.732	3,600 141.732 (Note 3)	3.2 x 32	IP40	-40 to +60 °C
		HYPR (Note 3) 3,600 141.732	3,600 141.732 (Note 3)		2,100 82.677	HYPR (Note 3) 3,600 141.732	3,600 141.732 (Note 3)					
	Allows flexible wiring 	FT-A32W (Note 2)	R1		STD (Note 3) 3,600 141.732	3,600 141.732 (Note 3)	U-LG LONG FAST H-SP	STD (Note 3) 3,600 141.732	3,600 141.732 (Note 3)			
	HYPR (Note 3) 3,600 141.732	3,000 118.110	HYPR (Note 3) 3,600 141.732		3,600 141.732 (Note 3)							
Wide beam 	Tough (Bending durability) FT-A11 (Note 2)	R2	STD (Note 3) 3,600 141.732	3,600 141.732 (Note 3)	U-LG LONG FAST H-SP	STD (Note 3) 3,600 141.732	3,600 141.732 (Note 3)	2.2 x 11	IP40	-40 to +70 °C		
	HYPR (Note 3) 3,600 141.732	1,100 43.307	HYPR (Note 3) 3,600 141.732	3,600 141.732 (Note 3)								
Allows flexible wiring 	FT-A11W (Note 2)	R1	STD (Note 3) 3,600 141.732	3,600 141.732 (Note 3)	U-LG LONG FAST H-SP	STD (Note 3) 3,600 141.732	3,600 141.732 (Note 3)					
HYPR (Note 3) 3,600 141.732	1,300 51.181	HYPR (Note 3) 3,600 141.732	3,600 141.732 (Note 3)									
Array 	Tough (Bending durability) FT-AL05	R2	STD (Note 3) 860 33.858	1,550 61.024	U-LG LONG FAST H-SP	STD (Note 3) 860 33.858	1,150 45.276	0.25 x 5.5	IP40	-55 to +80 °C		
HYPR (Note 3) 2,300 90.551	500 19.685	HYPR (Note 3) 2,300 90.551	170 6.693	HYPR (Note 3) 2,300 90.551	3,600 141.732 (Note 3)							
Reflective	Wide beam 	Tough (Bending durability) FD-A16	R4	2 m	STD (Note 3) 200 7.874	200 7.874	U-LG LONG FAST H-SP	STD (Note 3) 350 13.780	350 13.780	IP40	-40 to +60 °C	
	HYPR (Note 3) 140 5.512	140 5.512	HYPR (Note 3) 250 9.843		250 9.843							
Cannot use	75 2.953	HYPR (Note 3) 75 2.953	75 2.953									
Array 	Tough (Bending durability) FD-AL11	R2	STD (Note 3) 320 12.598	530 20.866	U-LG LONG FAST H-SP	STD (Note 3) 320 12.598	450 17.717	1,000 39.370	IP40	-55 to +80 °C		
HYPR (Note 3) 670 26.378	510 20.079	HYPR (Note 3) 670 26.378	180 7.087	HYPR (Note 3) 1,300 51.181	700 27.559							
50 1.969	320 12.598	HYPR (Note 3) 320 12.598	320 12.598									

- 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 slit mask (accessory) is sold separately. Refer to the last page for more details.
 3) The fiber cable length practically limits the sensing range.
 4) The **FX-550L** series does not have FAST mode.
 5) The sensing range of reflective type is specified for white non-glossy paper.

Tough : Refer to a fiber which possesses both unbreakable (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°) and more flexible (bending radius: R4 mm **R0.157 in** or less) features.
Bending durability : Refer to a fiber which possesses unbreakable bending-resistant feature (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°).

LIST OF FIBERS

Retroreflective type

Type	Shape of fiber head (mm)	Model No.	Bending radius (mm)	Fiber cable length Free-cut	Sensing range (mm in) (Note 1, 2, 3)				Protection	Ambient temp.
					FX-500 series		FX-550 / FX-550L series			
Retroreflective	With polarizing filters W5.2 × H9.5 × D16 W30 × H30 × D0.5	FR-Z50HW	R1	2 m	STD 100 to 990 3.937 to 38.976	100 to 1,400 3.937 to 55.118 100 to 1,200 3.937 to 47.244	STD 100 to 1,150 3.937 to 45.278	100 to 1,800 3.937 to 70.866 100 to 1,400 3.937 to 55.118	IP40	-25 to +55 °C
					HYPR 100 to 1,900 3.937 to 74.803	100 to 780 3.937 to 30.709 100 to 490 3.937 to 19.291	HYPR 100 to 2,250 3.937 to 88.583	100 to 950 3.937 to 37.402		
	Ultra-narrow beam W7.5 × H2.2 × D11.2 Aperture angle 3° (emitter) W4 × H2 × D21.5	FR-KZ22E	R2		STD 15 to 310 0.591 to 12.205	15 to 460 0.591 to 18.110 15 to 410 0.591 to 16.142	STD 15 to 540 0.591 to 21.260	15 to 700 0.591 to 27.559 15 to 600 0.591 to 23.622	IP30	-40 to +60 °C
					HYPR 15 to 570 0.591 to 22.441	15 to 220 0.591 to 8.661 15 to 100 0.591 to 3.937	HYPR 15 to 800 0.591 to 31.496	15 to 400 0.591 to 15.748		
	Narrow beam Top sensing W5.2 × H9.5 × D21 W10.6 × H28 × D10.1	FR-KZ50H			STD 20 to 300 0.787 to 11.811	20 to 800 0.787 to 31.496 20 to 400 0.787 to 15.748	STD 20 to 400 0.787 to 15.748	20 to 1,300 0.787 to 51.181 20 to 500 0.787 to 19.685	IP30	-40 to +60 °C
					HYPR 20 to 1,000 0.787 to 39.370	20 to 200 0.787 to 7.874 20 to 200 0.787 to 7.874	HYPR 20 to 1,600 0.787 to 62.992	20 to 350 0.787 to 13.780		
Side sensing W9.5 × H25 × D5.2 W28 × H10.6 × D10.1	FR-KZ50E									

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.
 3) The **FX-550L** series does not have FAST mode.

<Sensing range when FR-Z50HW is used in combination with a reflector (optional)>

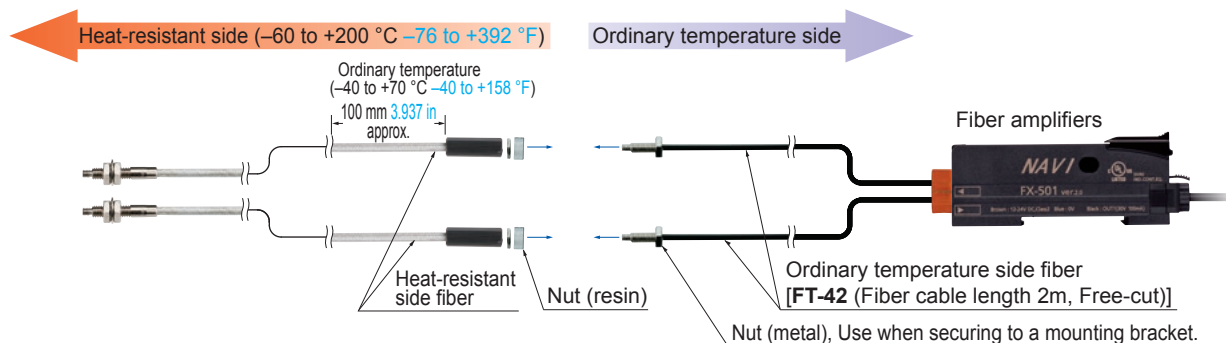
Reflector model No.	Sensing range (mm in)										
	FX-500 series						FX-550 / FX-550L series				
	HYPR	U-LG	LONG	STD	FAST	H-SP	HYPR	U-LG	LONG	STD	FAST
RF-230	100 to 19,000 3.937 to 748.030	100 to 8,000 3.937 to 314.960	100 to 5,000 3.937 to 196.850	100 to 3,600 3.937 to 141.732	100 to 2,900 3.937 to 114.173	100 to 1,400 3.937 to 55.118	100 to 20,000 3.937 to 78.402	100 to 11,000 3.937 to 433.071	100 to 7,000 3.937 to 275.591	100 to 5,000 3.937 to 196.850	100 to 3,500 3.937 to 137.795
RF-220	100 to 8,000 3.937 to 314.960	100 to 4,700 3.937 to 185.039	100 to 3,500 3.937 to 137.795	100 to 3,000 3.937 to 118.110	100 to 1,800 3.937 to 70.866	100 to 830 3.937 to 32.677	100 to 10,000 3.937 to 393.701	100 to 6,500 3.937 to 255.906	100 to 4,500 3.937 to 177.165	100 to 3,500 3.937 to 137.795	100 to 2,500 3.937 to 98.425
RF-210	100 to 5,500 3.937 to 216.535	100 to 2,700 3.937 to 106.299	100 to 2,400 3.937 to 94.488	100 to 1,500 3.937 to 59.055	100 to 1,200 3.937 to 47.244	100 to 530 3.937 to 20.866	100 to 7,000 3.937 to 275.591	100 to 4,000 3.937 to 157.480	100 to 3,600 3.937 to 141.732	100 to 2,800 3.937 to 110.236	100 to 2,100 3.937 to 82.677

Note: 1) The sensing range is the possible setting range for the reflector. The fiber can detect an object less than 100 mm **3.937 in**. 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.
 2) The **FX-550L** series does not have FAST mode.

Tough : Refer to a fiber which possesses both unbreakable (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°) and more flexible (bending radius: R4 mm **R0.157 in** or less) features.
Bending durability : Refer to a fiber which possesses unbreakable bending-resistant feature (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°).

LIST OF FIBERS

<Heat-resistant joint fiber set contents>



Heat-resistant

*Thru-beam type sensors are available as two pieces per set.

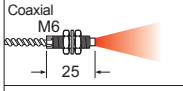
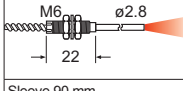
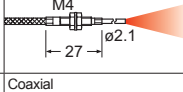

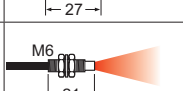
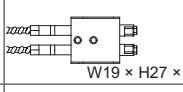
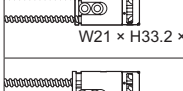
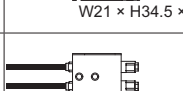
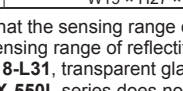

Type	Heat-resistant temp.	Shape of fiber head (mm)	Model No.	Bending radius (mm)	Fiber cable length Free-cut	Sensing range (mm in) (Note 1, 3)					Beam axis dia. (mm)	Ambient temp.	
						FX-500 series		FX-550 / FX-550L series		Other modes			U-LG LONG FAST H-SP
Thru-beam	350 °C	Lens mountable (FX-LE1/LE2/SV1)	FT-H35-M2	R25	2 m	STD 430 16.929	880 34.646	STD 1,050 41.339	2,300 90.551	Other modes	U-LG LONG FAST	ø1.2	-60 to +350 °C
		Sleeve 60 mm	FT-H35-M2S6	Fiber R25 Sleeve R10		HYPR 1,200 47.244	670 26.378	HYPR 3,600 141.732 (Note 2)	1,500 59.055				
	200 °C	Allows flexible wiring Lens mountable (FX-LE1/LE2/SV1)	FT-H20W-M1	R10	1 m	STD 470 18.504	1,000 39.370	STD 730 28.740	1,600 62.992 (Note 2)	Other modes	U-LG LONG FAST	ø0.8	-60 to +200 °C
		Lens mountable (FX-LE2 only)	FT-H20-M1	R25		HYPR (Note 2) 1,600 62.992	840 33.071	HYPR 1,000 39.370	1,050 41.339				
Heat-resistant (joint)	130 °C	Lens mountable (FX-LE2 only)	FT-H13-FM2	R25	2 m	STD 540 21.260	1,300 51.181	STD 1,000 39.370	1,600 62.992 (Note 2)	Other modes	U-LG LONG FAST	ø1.5	-60 to +130 °C
		Lens mountable (FX-LE1/LE2/SV1)	FT-H20-J20-S (Note 6)	Heat-resistant side R18 (Note 5)		HYPR (Note 2) 1,600 62.992	960 37.795	HYPR 1,600 62.992 (Note 2)	1,600 62.992 (Note 2)				
	200 °C	Lens mountable (FX-LE1/LE2/SV1)	FT-H20-J30-S (Note 6)	Heat-resistant side R18 (Note 5)	200 mm (Note 4)	STD 700 27.559	1,900 74.803	STD 1,150 45.276	2,700 106.299	Other modes	U-LG LONG FAST	ø1.2	-60 to +200 °C
		Lens mountable (FX-LE1/LE2/SV1)	FT-H20-J50-S (Note 6)			HYPR 1,300 51.181	1,300 51.181	HYPR 1,150 45.276	1,690 66.535				
Side-view	24	ø3.8 ø4	FT-H20-VJ50-S (Note 6)	Heat-resistant side R18 (Note 5)	300 mm (Note 4)	STD 470 18.504	1,000 39.370	STD 860 33.858	1,800 70.866	Other modes	U-LG LONG FAST	ø1.2	-60 to +200 °C
			FT-H20-VJ80-S (Note 6)			HYPR 1,600 62.992	790 31.102	HYPR 2,600 102.362	1,200 47.244				
Side-view	24	ø3.8 ø4	FT-H20-VJ50-S (Note 6)	Heat-resistant side R18 (Note 5)	500 mm (Note 4)	STD 600 23.622	1,300 51.181	STD 1,000 39.370	2,200 86.614	Other modes	U-LG LONG FAST	ø1.2	-60 to +200 °C
			FT-H20-VJ80-S (Note 6)			HYPR 2,100 82.677	980 38.583	HYPR 3,600 141.732 (Note 2)	1,400 55.118				

- 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 fiber cable length practically limits the sensing range.
 3) The FX-550L series does not have FAST mode.
 4) Fiber length (fixed-length) for heat-resistant fiber side. Fiber length for ordinary temperature side is 2 m 6.562 ft (free-cut).
 5) Bending-resistant fiber R4 mm R0.157 in or more for ordinary temperature side.
 6) Heat-resistant joint fibers and ordinary-temperature fibers (FT-42) are sold as a set.

Tough : Refer to a fiber which possesses both unbreakable (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°) and more flexible (bending radius: R4 mm **R0.157 in** or less) features.
Bending durability : Refer to a fiber which possesses unbreakable bending-resistant feature (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°).

LIST OF FIBERS

Heat-resistant

Type	Heat-resistant temp.	Shape of fiber head (mm)	Model No.	Bending radius (mm)	Fiber cable length ✂️: Free-cut	Sensing range (mm in) (Note 1, 2, 3)					Ambient temp.				
						FX-500 series	Other modes	U-LG LONG FAST H-SP	FX-550 / FX-550L series	Other modes		U-LG LONG FAST			
Reflective Heat-resistant	350 °C		FD-H35-M2	R25	2 m	STD 260 10.236		540 21.260 460 18.110 150 5.906 45 1.772	STD 400 15.748 HYPR 750 29.528		600 23.662 500 19.685 220 8.661	-60 to +350 °C			
			Sleeve 60 mm 	FD-H35-M2S6		Fiber R25 Sleeve		HYPR 720 28.346							
		Sleeve 90 mm 	FD-H35-20S	R10		STD 260 10.236 HYPR 840 33.071		550 21.654 440 17.323 140 5.512 45 1.772	STD 410 16.142 HYPR 850 33.465		750 29.528 550 21.654 230 9.055				
			200 °C	Coaxial M6 		FD-H20-M1	R25	1 m	STD 330 12.992 HYPR 840 33.071		550 21.654 500 19.685 200 7.874 55 2.165		STD 450 17.717 HYPR 1,350 53.150		1,000 39.370 650 25.591 300 11.811
		Coaxial M4 		FD-H20-21		STD 230 9.055 HYPR 770 30.315				500 19.685 380 14.961 130 5.118 45 1.772	STD 450 17.717 HYPR 1,250 49.213			850 33.465 650 25.591 250 9.843	
		130 °C	M6 	FD-H13-FM2		R25	✂️ 2 m	STD 350 13.780 HYPR 880 34.646		640 25.197 600 23.622 200 7.874 65 2.559	STD 670 26.378 HYPR 1,650 64.961			1,300 51.181 940 37.008 390 15.354	-60 to +130 °C
	Glass substrate detection convergent reflective	300 °C		FD-H30-L32	R25	2 m	STD 0 to 17 0 to 0.669 HYPR 0 to 40 0 to 1.575	0 to 30 0 to 1.181 0 to 25 0 to 0.984 0 to 12 0 to 0.472 1.5 to 6 0.059 to 0.236	STD 0 to 21 0 to 0.827 HYPR 0 to 60 0 to 2.362		0 to 42 0 to 1.654 0 to 25 0 to 0.984 0 to 16 0 to 0.630	-60 to +300 °C			
		250 °C		FD-H25-L43	R25		3 m	STD 1.5 to 26 0.059 to 1.024 HYPR 1 to 31 0.039 to 1.220	1 to 30 0.039 to 1.181 1 to 28 0.039 to 1.102 1.5 to 24 0.059 to 0.945 2 to 18 0.079 to 0.709	STD 1 to 28 0.039 to 1.102 HYPR 1 to 31 0.039 to 1.220		1 to 30 0.039 to 1.181 1 to 29 0.039 to 1.142 1 to 26 0.039 to 1.024	-20 to +250 °C (Ordinary temp. side: -20 to +70 °C)		
				FD-H25-L45				STD 5 to 42 0.197 to 1.654 HYPR 4 to 43.5 0.157 to 1.713	4 to 43 0.157 to 1.693 4.5 to 43 0.177 to 1.693 5 to 40 0.197 to 1.575 6.5 to 34 0.256 to 1.339	STD 4 to 48 0.157 to 1.890 HYPR 4 to 51 0.157 to 2.008		4 to 50 0.157 to 1.969 4 to 49 0.157 to 1.929 4 to 44 0.157 to 1.732			
		180 °C		FD-H18-L31	R25		✂️ 2 m	STD 0 to 16 0 to 0.630 HYPR 0 to 60 0 to 2.362	0 to 32 0 to 1.260 0 to 24 0 to 0.945 0 to 13 0 to 0.512 2 to 6.5 0.079 to 0.256	STD 0 to 45 0 to 1.772 HYPR 0 to 130 0 to 5.118		0 to 85 0 to 3.346 0 to 60 0 to 2.362 0 to 30 0 to 1.181	-60 to +180 °C		

- 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 of reflective type is the value for white non-glossy paper (50 × 50 mm **1.969 × 1.969 in** glass substrate for **FD-H30-L32** and **FD-H18-L31**, transparent glass 100 × 100 × 10.7 mm **3.937 × 3.937 × 10.028 in** for **FD-H25-L43** and **FD-H25-L45**).
 3) The **FX-550L** series does not have FAST mode.

Tough : Refer to a fiber which possesses both unbreakable (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°) and more flexible (bending radius: R4 mm **R0.157 in** or less) features.
Bending durability : Refer to a fiber which possesses unbreakable bending-resistant feature (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°).

LIST OF FIBERS

Oil-resistant

*Thru-beam type sensors are available as two pieces per set.

Type	Shape of fiber head (mm)	Model No.	Bending radius (mm)	Fiber cable length Free-cut	Sensing range (mm in) (Note 1, 2, 3)				Beam axis dia. (mm)	Protection	Ambient temp.		
					FX-500 series	Other modes	U-LG LONG FAST H-SP	FX-550 / FX-550L series				Other modes	U-LG LONG FAST
Thru-beam Oil-resistant Square head type	Full-protection type W10 × H11 × D21.2	Tough (Bending durability) FT-R60Y	R4	2 m	STD	3,600	141.732 (Note 4)	STD	3,600	141.732 (Note 4)	ø3.5	IP68G	-55 to +80 °C
					HYPR	2,100	82.677	HYPR	3,600	141.732 (Note 4)			
Thru-beam Oil-resistant Square head type	Cable-protection type Lens mountable W7 × H9.5 × D15.5	Tough (Bending durability) FT-R44Y	R4	2 m	STD	1,600	62.992	STD	1,300	51.181	ø1	IP67 (Note 5)	-55 to +80 °C
					HYPR	720	28.346	HYPR	1,800	70.866			
Reflective Oil-resistant Square head type	Cable-protection type W10 × H11 × D15.5	Tough (Bending durability) FD-R61Y	R4	2 m	STD	610	24.016	STD	450	17.717	—	IP67 (Note 5)	-55 to +80 °C
					HYPR	280	11.024	HYPR	650	25.591			

- 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 **FX-550L** series does not have FAST mode.
 3) The sensing range of reflective type is specified for white non-glossy paper.
 4) The fiber cable length practically limits the sensing range.
 5) The fiber part is oil-resistant.

Chemical-resistant

*Thru-beam type sensors are available as two pieces per set.

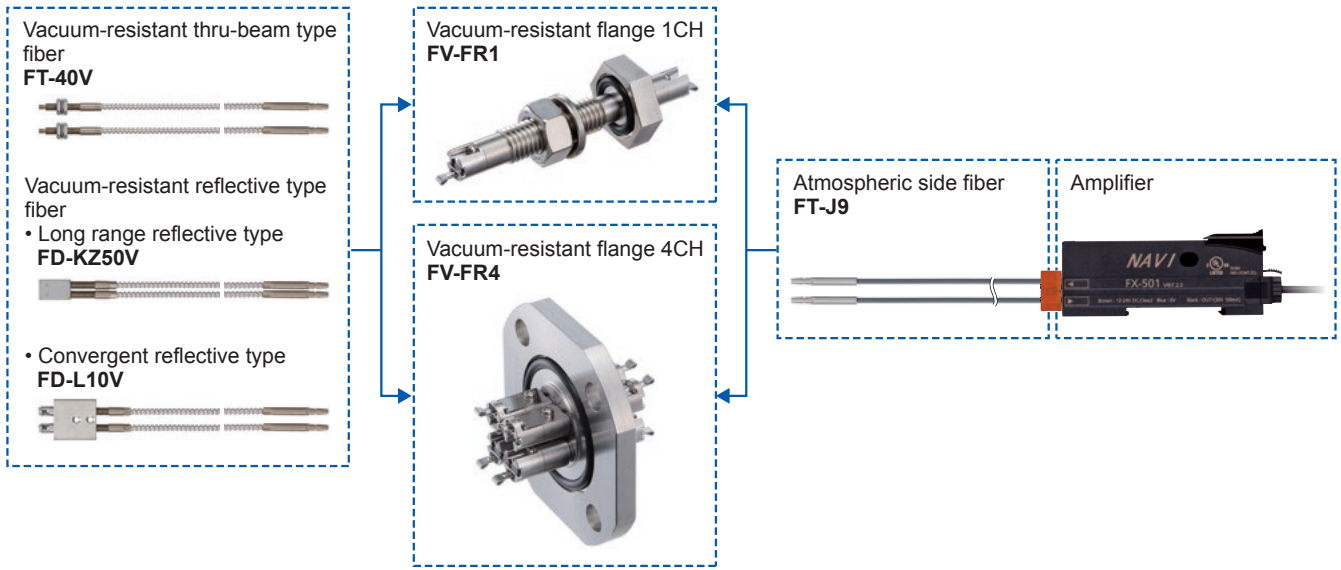
Type	Shape of fiber head (mm)	Model No.	Bending radius (mm)	Fiber cable length Free-cut	Sensing range (mm in) (Note 1, 2, 3)				Beam axis dia. (mm)	Protection	Ambient temp.			
					FX-500 series	Other modes	U-LG LONG FAST H-SP	FX-550 / FX-550L series				Other modes	U-LG LONG FAST	
Thru-beam Chemical-resistant	Flat type Easy mounting • Rectangular head SEMI S2 compliant Metal-free W7 × H15 × D13	Tough (Bending durability) FT-Z802Y	R4	2 m	STD	3,600	141.732 (Note 4)	STD	3,600	141.732 (Note 4)	ø3.7	IP68G	0 to +60 °C	
					HYPR	3,100	122.047	HYPR	3,600	141.732 (Note 4)				
	Cylindrical type	Heat-resistant 115 °C Metal-free ø5.5	FT-HL80Y	R30	2 m	STD	3,600	141.732 (Note 4)	STD	3,600	141.732 (Note 4)	ø3.7	IP68G	-40 to +115 °C
						HYPR	(Note 4)	3,600	141.732	HYPR	3,600			
Cylindrical type	Metal-free ø5.5	FT-L80Y	R30	2 m	STD	3,600	141.732 (Note 4)	STD	3,600	141.732 (Note 4)	ø2.8	IP68G	-40 to +70 °C	
					HYPR	(Note 4)	3,600	141.732	HYPR	3,600				141.732 (Note 4)
Cylindrical type	Side-view Metal-free ø5.5	FT-V80Y	R30	2 m	STD	1,300	51.181	STD	2,200	86.614	ø2.8	IP68G	-40 to +70 °C	
					HYPR	(Note 4)	3,600	141.732	HYPR	3,600				141.732 (Note 4)
Reflective Chemical-resistant Cylindrical type	Metal-free ø5.5	Tough (Bending durability) FD-S60Y	R4	2 m	STD	590	23.228	STD	450	17.717	—	IP68G	-40 to +70 °C	

- 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 **FX-550L** series does not have FAST mode.
 3) The sensing range of reflective type is specified for white non-glossy paper.
 4) The fiber cable length practically limits the sensing range.
 5) The allowable cutting range is 500 mm **19.685 in** from the end that the amplifier inserted.

Tough : Refer to a fiber which possesses both unbreakable (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°) and more flexible (bending radius: R4 mm **R0.157 in** or less) features.
Bending durability : Refer to a fiber which possesses unbreakable bending-resistant feature (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°).

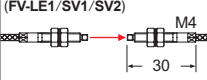
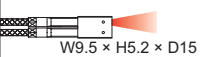
LIST OF FIBERS

<One-touch connection system compatible with 4CH / 1CH flange Vacuum-resistant fiber set contents>



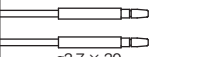
Vacuum-resistant (One-touch connection system compatible with 4CH / 1CH flange)

*Thru-beam type sensors are available as two pieces per set.

Type	Shape of fiber head (mm)	Model No.	Bending radius (mm)	Fiber cable length	Sensing range (mm in) (Note 3, 4)				Beam axis dia. (mm)	Ambient temp.	
					FX-500 series	Other modes	U-LG LONG FAST H-SP	FX-550 / FX-550L series			Other modes
Thru-beam	300 °C, Lens mountable (FV-LE1/SV1/SV2) 	FT-40V	R25	1 m (Note 2)	STD 270 10.630 HYPR 1,000 39.370	590 23.228 470 18.504 160 6.299 55 2.165		STD 400 15.748 HYPR 1,400 55.118	950 37.402 620 24.409 250 9.843	ø1.3	-30 to +300 °C
Vacuum-resistant	300 °C, Rectangular head  W9.5 × H5.2 × D15	FD-KZ50V	R25	1 m (Note 2)	STD 20 to 200 0.787 to 7.874 HYPR 5 to 500 0.197 to 19.685	10 to 340 0.394 to 13.386 15 to 270 0.591 to 10.630 20 to 120 0.787 to 4.724 20 to 45 0.787 to 1.772		STD 20 to 450 0.787 to 17.717 HYPR 5 to 1,500 0.197 to 59.055	10 to 1,000 0.394 to 39.370 15 to 650 0.591 to 25.591 20 to 300 0.787 to 11.811		-30 to +300 °C
		FD-L10V		3 m (Note 2)	STD 0 to 8 0 to 0.315 HYPR 0 to 18 0 to 0.709	0 to 12 0 to 0.472 0 to 10 0 to 0.394 0 to 5.5 0 to 0.217 1.5 to 3 0.059 to 0.118		STD 0 to 11 0 to 0.433 HYPR 0 to 27 0 to 1.063	0 to 19 0 to 0.748 0 to 13 0 to 0.512 0 to 7.5 0 to 0.295		

- Notes: 1) Atmospheric side fiber is optional and sold separately.
- 2) This is not a "free-cut" type. We offer only semi-custom products in which the fiber length can be specified in 100 mm 3.937 in increments. For details, please contact our sales office.
- 3) The sensing range is the value for transparent glass 100 × 100 × t0.7 mm 3.937 × 3.937 × t0.028 in.
- 4) FX-550L series does not have FAST mode.

Atmospheric side (one pair set)



Type	Shape of fiber head (mm)	Model No.	Bending radius (mm)	Fiber cable length ✂: Free-cut	Ambient temp.
Atmospheric side	 ø3.7 × 30	Tough Bending durability FT-J9	R4	✂ 2 m (Note 1, 2)	-30 to +80 °C

- Notes: 1) We offer only semi-custom products in which the fiber length can be specified in 1 m 3.280 ft increments. For details, please contact our sales office.
- 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.

Tough : Refer to a fiber which possesses both unbreakable (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°) and more flexible (bending radius: R4 mm **R0.157 in** or less) features.
Bending durability : Refer to a fiber which possesses unbreakable bending-resistant feature (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°).

LIST OF FIBERS

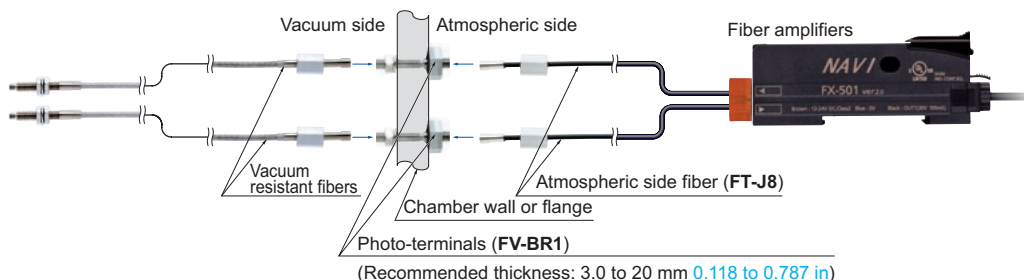
Vacuum-resistant flange

Designation	Model No.	Description	
Vacuum-resistant flange 1CH	FV-FR1		Atmospheric side and vacuum side are isolated.
			Main specifications
Vacuum-resistant flange 4CH	FV-FR4		Model No.
			Applicable fibers
			Leakage
			Ambient temperature
			Ambient humidity
			Tightening torque
			Tensile strength
			O-ring size
			Weight
			Material

Recommended thickness of vacuum chamber wall
 • For **FV-FR1**: 3.0 to 40.0 mm **0.118 to 1.575 in** (Note 1)
 • For **FV-FR4**: 3.0 mm **0.118 in** or more (Note 2)

Notes: 1) Confirm the wall thickness in advance since the **FV-FR1** cannot be installed to a vacuum chamber with a wall thickness outside the recommended thickness range.
 2) If the vacuum chamber wall is too thick, the **FV-FR4** may not be able to connect to the vacuum side fiber. In that case, connect the **FV-FR4** to the vacuum side fiber before the installation.

<Vacuum-resistant fiber set contents>



Vacuum-resistant

*Thru-beam type sensors are available as two pieces per set.

Type	Shape of fiber head (mm)	Model No.	Bending radius (mm)	Fiber cable length	Sensing range (mm in) (Note 3, 4)				Beam axis dia. (mm)	Ambient temp.	
					FX-500 series		FX-550 / FX-550L series				
Thru-beam	300 °C Lens mountable (FV-LE1/SV2) M4 30	FT-H30-M1V-S (Note 1)	R18	1 m (Note 2)	STD	590	23.228	STD	950	ø1.2	-30 to +300 °C
					HYPR	470	18.504	HYPR	620		
						1,000	39.370		250		
Reflective	300 °C, Rectangular head W9.5 × H5.2 × D15	FD-H30-KZ1V-S (Note 1)	R18	1 m (Note 2)	STD	10 to 340	0.394 to 13.386	STD	10 to 1,000	—	-30 to +300 °C
					HYPR	20 to 200	0.787 to 7.874	HYPR	15 to 270		
						5 to 500	0.197 to 19.685		650		
Convergent reflective	300 °C, Glass substrate detection W19 × H5 × D27	FD-H30-L32V-S (Note 1)	R18	3 m (Note 2)	STD	0 to 12	0 to 0.472	STD	0 to 19	—	-30 to +300 °C
					HYPR	0 to 8	0 to 0.315	HYPR	0 to 10		
						0 to 18	0 to 0.709		0 to 5.5		

Notes: 1) Sold as a set comprising vacuum type fiber + photo-terminal (**FV-BR1**) + fiber at atmospheric side (**FT-J8**).
 2) This is not a "free-cut" type.
 3) **FX-550L** series does not have FAST mode.
 4) The sensing range is the value for transparent glass 100 × 100 × 0.7 mm **3.937 × 3.937 × 0.028 in**.

Tough : Refer to a fiber which possesses both unbreakable (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°) and more flexible (bending radius: R4 mm **R0.157 in** or less) features.
Bending durability : Refer to a fiber which possesses unbreakable bending-resistant feature (bending radius: R10 mm **R0.394 in**, reciprocating bending: 180°).

LIST OF FIBERS


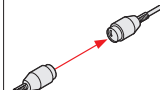
Liquid leak / Liquid detection

Type	Shape of fiber head (mm)	Model No.	Bending radius (mm)	Fiber cable length : Free-cut	Description		Protection	Ambient temp.
					FX-500 series (STD mode)	FX-550 / FX-550L series (STD mode)		
Reflective type	Contact type	Liquid level sensing	Heat resistant 125 °C Fluorine resin coating ø6 	FD-F8Y	Protective tube R40 Fiber R15 : 2 m (Note 1)	ø6 mm ø0.236 in Protective tube: Fluorine resin, length 1,000 mm 39.370 in (not cuttable) Liquid surface not contacted: Beam received, Liquid surface contacted: Beam not received	IP68	-40 to +125 °C
			Heat resistant 105 °C Fluorine resin coating Metal-free ø4 	FD-HF40Y (Note 2)	Protective tube R20 Fiber R10 : 2 m	ø4 mm ø0.157 in Protective tube: Fluorine resin, length 500 mm 19.685 in (cuttable) Liquid surface not contacted: Beam received, Liquid surface contacted: Beam not received	IP68G	-40 to +105 °C
			Heat resistant 70 °C Fluorine resin coating throughout the fiber Metal-free ø4 	FD-F41Y (Note 2)		ø4 mm ø0.157 in Protective tube: Fluorine resin, length 500 mm 19.685 in (cuttable) Liquid surface not contacted: Beam received, Liquid surface contacted: Beam not received		-40 to +70 °C
	Liquid leak detection	SEMI S2 compliant W20 × H30 × D10 	Tough (Bending durability) FD-F71	R4 : 5 m	Liquid leak detection Leak absent: Beam received, Leak present: Beam not received Compatible amplifier: FX-500 / FX-550 / FX-550L series only	IP67	-20 to +60 °C	
Reflective type	Pipe-mountable type	Liquid level sensing	Standard W25 × H13 × D20 	FD-F41	R10 : 2 m	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 not received	—	-40 to +100 °C
			For 1 mm thick PFA pipe W25 × H13 × D20 			FD-F4		
		Liquid sensing	Array fiber W6.5 × H28.3 × D17 	Tough (Bending durability) FD-FA93	R4 : 2 m	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 not received	IP40	-40 to +70 °C
	Liquid sensing	SEMI S2 compliant W23 × H20 × D17 	Tough (Bending durability) FT-F93	Protective tube R20 Fiber R2 : 2 m	Applicable pipe diameter: Outer dia. ø3 to ø10 mm ø0.118 to ø0.394 in transparent pipe [PFA (fluorine resin) or equivalently transparent pipe, wall thickness 0.3 to 1 mm 0.012 to 0.039 in] Liquid absent: Beam not received, Liquid present: Beam received Compatible amplifier: FX-500 / FX-550 / FX-550L series only	-40 to +60 °C		

Notes: 1) The allowable cutting range is 1,000 mm **39.370 in** from the end that the amplifier inserted.
 2) Liquid inflow prevention joint, protective tube extension joint, fiber mounting joint is available.

FIBER OPTIONS


Lens (For thru-beam type fiber)

Designation	Model No.	Description																																																																																																																																																																																																																					
For thru-beam type fiber	Expansion lens (Note 1) FX-LE1	<p>Increases the sensing range by 5 times or more.</p> <p>• Ambient temperature: -60 to +350 °C -76 to +662 °F (Note 4) • Beam dia: ø3.6 mm ø0.142 in</p> <p>Sensing range (mm in) [Lens on both sides] (Note 3)</p> <table border="1"> <thead> <tr> <th colspan="2">Amplifier</th> <th colspan="5">FX-500 series (Upper value) FX-550 / FX-550L series (Lower value)</th> </tr> <tr> <th>Fiber</th> <th>Mode</th> <th>HYPR</th> <th>U-LG</th> <th>LONG</th> <th>STD</th> <th>FAST</th> <th>H-SP</th> </tr> </thead> <tbody> <tr> <td rowspan="3">FT-43</td> <td></td> <td>3,600</td> <td>3,600</td> <td>3,600</td> <td>3,600</td> <td>3,600</td> <td>1,600</td> </tr> <tr> <td></td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>62.992</td> </tr> <tr> <td></td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>—</td> </tr> <tr> <td rowspan="3">FT-42 FT-42W</td> <td></td> <td>3,600</td> <td>3,600</td> <td>3,600</td> <td>3,600</td> <td>3,600</td> <td>2,200</td> </tr> <tr> <td></td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>86.614</td> </tr> <tr> <td></td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>—</td> </tr> <tr> <td rowspan="3">FT-45X</td> <td></td> <td>1,600</td> <td>1,600</td> <td>1,600</td> <td>1,600</td> <td>1,600</td> <td>1,500</td> </tr> <tr> <td></td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>59.055</td> </tr> <tr> <td></td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>—</td> </tr> <tr> <td rowspan="3">FT-R40</td> 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<td>3,600</td> <td>3,300</td> <td>1,400</td> </tr> <tr> <td></td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>129.921</td> <td>55.118</td> </tr> <tr> <td></td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>—</td> </tr> <tr> <td rowspan="3">FT-H20W-M1</td> <td></td> <td>1,600</td> <td>1,600</td> <td>1,600</td> <td>1,600</td> <td>1,600</td> <td>850</td> </tr> <tr> <td></td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>33.465</td> </tr> <tr> <td></td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>—</td> </tr> <tr> <td rowspan="3">FT-H20-M1</td> <td></td> <td>1,600</td> <td>1,600</td> <td>1,600</td> <td>1,600</td> <td>1,600</td> <td>1,200</td> </tr> <tr> <td></td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>47.244</td> </tr> <tr> <td></td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>—</td> </tr> <tr> <td rowspan="3">FT-H20-J50-S FT-H20-J30-S FT-H20-J20-S</td> <td></td> <td>3,600</td> <td>3,600</td> <td>3,500</td> <td>2,000</td> <td>1,600</td> <td>500</td> </tr> <tr> <td></td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>137.795</td> <td>78.740</td> <td>62.992</td> <td>19.685</td> </tr> <tr> <td></td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>—</td> </tr> </tbody> </table> 	Amplifier		FX-500 series (Upper value) FX-550 / FX-550L series (Lower value)					Fiber	Mode	HYPR	U-LG	LONG	STD	FAST	H-SP	FT-43		3,600	3,600	3,600	3,600	3,600	1,600		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	62.992		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	—	FT-42 FT-42W		3,600	3,600	3,600	3,600	3,600	2,200		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	86.614		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	—	FT-45X		1,600	1,600	1,600	1,600	1,600	1,500		62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	59.055		62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	—	FT-R40		3,600	3,600	3,600	3,600	3,600	1,900		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	74.803		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	—	FT-R43 FT-R44Y		3,600	3,600	3,600	3,600	1,900	670		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	74.803	26.378		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	—	FT-H35-M2		3,600	3,600	3,600	3,600	3,300	1,400		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	129.921	55.118		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	—	FT-H20W-M1		1,600	1,600	1,600	1,600	1,600	850		62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	33.465		62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	—	FT-H20-M1		1,600	1,600	1,600	1,600	1,600	1,200		62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	47.244		62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	—	FT-H20-J50-S FT-H20-J30-S FT-H20-J20-S		3,600	3,600	3,500	2,000	1,600	500		141.732 (Note 2)	141.732 (Note 2)	137.795	78.740	62.992	19.685		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	—
		Amplifier		FX-500 series (Upper value) FX-550 / FX-550L series (Lower value)																																																																																																																																																																																																																			
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		FT-43		3,600	3,600	3,600	3,600	3,600	1,600																																																																																																																																																																																																														
				141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	62.992																																																																																																																																																																																																														
				141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	—																																																																																																																																																																																																														
		FT-42 FT-42W		3,600	3,600	3,600	3,600	3,600	2,200																																																																																																																																																																																																														
				141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	86.614																																																																																																																																																																																																														
				141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	—																																																																																																																																																																																																														
		FT-45X		1,600	1,600	1,600	1,600	1,600	1,500																																																																																																																																																																																																														
	62.992 (Note 2)		62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	59.055																																																																																																																																																																																																																
	62.992 (Note 2)		62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	—																																																																																																																																																																																																																
FT-R40		3,600	3,600	3,600	3,600	3,600	1,900																																																																																																																																																																																																																
		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	74.803																																																																																																																																																																																																																
		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	—																																																																																																																																																																																																																
FT-R43 FT-R44Y		3,600	3,600	3,600	3,600	1,900	670																																																																																																																																																																																																																
		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	74.803	26.378																																																																																																																																																																																																																
		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	—																																																																																																																																																																																																																
FT-H35-M2		3,600	3,600	3,600	3,600	3,300	1,400																																																																																																																																																																																																																
		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	129.921	55.118																																																																																																																																																																																																																
		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	—																																																																																																																																																																																																																
FT-H20W-M1		1,600	1,600	1,600	1,600	1,600	850																																																																																																																																																																																																																
		62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	33.465																																																																																																																																																																																																																
		62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	—																																																																																																																																																																																																																
FT-H20-M1		1,600	1,600	1,600	1,600	1,600	1,200																																																																																																																																																																																																																
		62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	47.244																																																																																																																																																																																																																
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FT-H20-J50-S FT-H20-J30-S FT-H20-J20-S		3,600	3,600	3,500	2,000	1,600	500																																																																																																																																																																																																																
		141.732 (Note 2)	141.732 (Note 2)	137.795	78.740	62.992	19.685																																																																																																																																																																																																																
		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	—																																																																																																																																																																																																																
Super-expansion lens (Note 1)	Super-expansion lens (Note 1) FX-LE2	<p>Tremendously increases the sensing range with large diameter lenses.</p> <p>• Ambient temperature: -60 to +350 °C -76 to +662 °F (Note 4) • Beam dia: ø9.8 mm ø0.386 in</p> <p>Sensing range (mm in) [Lens on both sides] (Note 3)</p> <table border="1"> <thead> <tr> <th colspan="2">Amplifier</th> <th colspan="5">FX-500 series (Upper value) FX-550 / FX-550L series (Lower value)</th> </tr> <tr> <th>Fiber</th> <th>Mode</th> <th>HYPR</th> <th>U-LG</th> <th>LONG</th> <th>STD</th> <th>FAST</th> <th>H-SP</th> </tr> </thead> <tbody> <tr> <td rowspan="3">FT-43 FT-42 FT-42W</td> <td></td> <td>3,600</td> <td>3,600</td> <td>3,600</td> <td>3,600</td> <td>3,600</td> <td>3,600</td> </tr> <tr> <td></td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> </tr> <tr> <td></td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> 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<td>—</td> </tr> <tr> <td rowspan="3">FT-H20W-M1 FT-H20-M1</td> <td></td> <td>1,600</td> <td>1,600</td> <td>1,600</td> <td>1,600</td> <td>1,600</td> <td>1,600</td> </tr> <tr> <td></td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> </tr> <tr> <td></td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>62.992 (Note 2)</td> <td>—</td> </tr> <tr> <td rowspan="3">FT-H13-FM2</td> <td></td> <td>3,600</td> <td>3,600</td> <td>3,600</td> <td>3,600</td> <td>3,600</td> <td>3,600</td> </tr> <tr> <td></td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> </tr> <tr> <td></td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>—</td> </tr> <tr> <td rowspan="3">FT-H20-J50-S FT-H20-J30-S FT-H20-J20-S</td> <td></td> <td>3,600</td> <td>3,600</td> <td>3,600</td> <td>3,600</td> <td>3,600</td> <td>3,600</td> </tr> <tr> <td></td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> </tr> <tr> <td></td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>—</td> </tr> </tbody> </table> 	Amplifier		FX-500 series (Upper value) FX-550 / FX-550L series (Lower value)					Fiber	Mode	HYPR	U-LG	LONG	STD	FAST	H-SP	FT-43 FT-42 FT-42W		3,600	3,600	3,600	3,600	3,600	3,600		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	—	FT-45X		1,600	1,600	1,600	1,600	1,600	1,600		62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)		62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	—	FT-R40		3,600	3,600	3,600	3,600	3,600	3,600		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	—	FT-R41W FT-R43 FT-R44Y		3,600	3,600	3,600	3,600	3,600	3,600		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	—	FT-H35-M2		3,600	3,600	3,600	3,600	3,600	3,600		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	—	FT-H20W-M1 FT-H20-M1		1,600	1,600	1,600	1,600	1,600	1,600		62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)		62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	—	FT-H13-FM2		3,600	3,600	3,600	3,600	3,600	3,600		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	—	FT-H20-J50-S FT-H20-J30-S FT-H20-J20-S		3,600	3,600	3,600	3,600	3,600	3,600		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	—																						
		Amplifier		FX-500 series (Upper value) FX-550 / FX-550L series (Lower value)																																																																																																																																																																																																																			
		Fiber	Mode	HYPR	U-LG	LONG	STD	FAST	H-SP																																																																																																																																																																																																														
		FT-43 FT-42 FT-42W		3,600	3,600	3,600	3,600	3,600	3,600																																																																																																																																																																																																														
				141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)																																																																																																																																																																																																														
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		FT-45X		1,600	1,600	1,600	1,600	1,600	1,600																																																																																																																																																																																																														
				62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)																																																																																																																																																																																																														
				62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	—																																																																																																																																																																																																														
		FT-R40		3,600	3,600	3,600	3,600	3,600	3,600																																																																																																																																																																																																														
	141.732 (Note 2)		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)																																																																																																																																																																																																																
	141.732 (Note 2)		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	—																																																																																																																																																																																																																
FT-R41W FT-R43 FT-R44Y		3,600	3,600	3,600	3,600	3,600	3,600																																																																																																																																																																																																																
		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)																																																																																																																																																																																																																
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FT-H35-M2		3,600	3,600	3,600	3,600	3,600	3,600																																																																																																																																																																																																																
		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)																																																																																																																																																																																																																
		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	—																																																																																																																																																																																																																
FT-H20W-M1 FT-H20-M1		1,600	1,600	1,600	1,600	1,600	1,600																																																																																																																																																																																																																
		62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)																																																																																																																																																																																																																
		62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	62.992 (Note 2)	—																																																																																																																																																																																																																
FT-H13-FM2		3,600	3,600	3,600	3,600	3,600	3,600																																																																																																																																																																																																																
		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)																																																																																																																																																																																																																
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FT-H20-J50-S FT-H20-J30-S FT-H20-J20-S		3,600	3,600	3,600	3,600	3,600	3,600																																																																																																																																																																																																																
		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)																																																																																																																																																																																																																
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- Notes: 1) Be careful sure to use it only after you have adjusted it sufficiently when installing the thru-beam type fiber equipped with the expansion lens, as the beam envelope becomes narrow and alignment is difficult.
 2) The fiber cable length practically limits the sensing range.
 3) **FX-550L** series does not have FAST mode.
 4) Refer to [LIST OF FIBERS](#) (p.25~) for the ambient temperature of fibers to be used in combination.

FIBER OPTIONS




Lens (For thru-beam type fiber)

Designation		Model No.	Description									
For thru-beam type fiber	Side-view lens	FX-SV1		Beam axis is bent by 90°. • Ambient temperature: -60 to +300 °C -76 to +572 °F (Note 1) • Beam dia: ø2.8 mm ø0.110 in Sensing range (mm in) [Lens on both sides] (Note 3)								
				Amplifier		FX-500 series (Upper value)						
				Fiber Mode		FX-550 / FX-550L series (Lower value)						
						HYPR	U-LG	LONG	STD	FAST	H-SP	
				FT-43	3,600 141.732 (Note 2) 3,600 141.732 (Note 2)	3,400 133.858 3,600 141.732 (Note 2)	2,600 102.362 3,600 141.732 (Note 2)	1,700 66.929 2,300 90.551	970 38.189 1,400 55.118		310 12.205 —	
				FT-42	3,600 141.732 (Note 2) 3,600 141.732 (Note 2)	3,600 141.732 (Note 2) 3,600 141.732 (Note 2)	3,600 141.732 (Note 2) 3,600 141.732 (Note 2)	2,100 82.677 2,800 110.236	1,150 45.276 1,700 66.929		370 14.567 —	
				FT-42W	3,600 141.732 (Note 2) 3,600 141.732 (Note 2)	3,500 137.795 3,600 141.732 (Note 2)	2,700 106.299 3,600 141.732 (Note 2)	1,800 70.866 2,300 90.551	990 38.976 1,400 55.118		320 12.598 —	
				FT-45X	1,600 62.992 (Note 2) 1,600 62.992 (Note 2)	1,600 62.992 (Note 2) 1,600 62.992 (Note 2)	1,600 62.992 (Note 2) 1,600 62.992 (Note 2)	1,400 55.118 1,600 62.992 (Note 2)	800 31.496 1,600 62.992 (Note 2)		210 8.268 —	
				FT-R43	3,200 125.984 3,600 141.732 (Note 2)	1,800 70.866 3,600 141.732 (Note 2)	1,300 51.181 2,700 106.299	950 37.402 1,900 74.803	510 20.079 1,200 47.244		160 6.299 —	
				FT-R44Y	3,200 125.984 3,600 141.732 (Note 2)	1,800 70.866 3,600 141.732 (Note 2)	1,300 51.181 3,200 125.984	950 37.402 2,200 86.614	510 20.079 1,400 55.118		160 6.299 —	
				FT-H35-M2	3,500 137.795 3,600 141.732 (Note 2)	1,600 62.992 2,800 110.236	1,200 47.244 1,800 70.866	780 30.709 1,300 51.181	500 19.685 750 29.528		150 5.906 —	
				FT-H20W-M1	1,600 62.992 (Note 2) 1,600 62.992 (Note 2)	1,600 62.992 (Note 2) 1,600 62.992 (Note 2)	1,500 59.055 1,600 62.992 (Note 2)	950 37.402 1,250 49.213	560 22.047 690 27.165		190 7.480 —	
				FT-H20-M1	1,600 62.992 (Note 2) 1,600 62.992 (Note 2)	1,600 62.992 (Note 2) 1,600 62.992 (Note 2)	1,300 51.181 1,600 62.992 (Note 2)	780 30.709 1,600 62.992 (Note 2)	500 19.685 800 31.496		150 5.906 —	
				FT-H20-J50-S FT-H20-J30-S FT-H20-J20-S	1,600 62.992 (Note 2) 3,600 141.732 (Note 2)	960 37.795 2,400 94.488	740 29.134 1,500 59.055	450 17.717 1,100 43.307	290 11.417 680 26.771		80 3.150 —	

- Notes: 1) Refer to [LIST OF FIBERS](#) (p.25~) for the ambient temperature of fibers to be used in combination.
 2) The fiber cable length practically limits the sensing range.
 3) **FX-550L** series does not have FAST mode.

FIBER OPTIONS

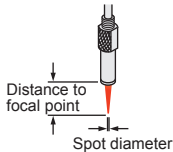
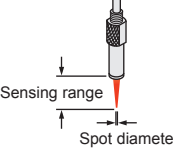
Vacuum-resistant lens (For thru-beam type fiber)

Designation	Model No.	Description																																																																																			
For thru-beam type fiber	Vacuum-resistant expansion lens (Note 1)	FV-LE1	 <p>Increases the sensing range 4 times or more. • Ambient temperature: -60 to +350 °C -76 to +662 °F (Note 6) • Beam axis dia: \varnothing3.6 mm \varnothing0.142 in Sensing range (mm in) [Lens on both sides] (Note 3, 4, 5)</p> <table border="1"> <thead> <tr> <th rowspan="2">Fiber</th> <th rowspan="2">Mode</th> <th colspan="6">Amplifier</th> </tr> <tr> <th colspan="3">FX-500 series (Upper value)</th> <th colspan="3">FX-550 / FX-550L series (Lower value)</th> </tr> <tr> <th></th> <th></th> <th>HYPR</th> <th>U-LG</th> <th>LONG</th> <th>STD</th> <th>FAST</th> <th>H-SP</th> </tr> </thead> <tbody> <tr> <td rowspan="3">FT-40V</td> <td>1,800 (Note 2)</td> <td>1,800 (Note 2)</td> <td>1,800 (Note 2)</td> <td>1,800 (Note 2)</td> <td>1,500</td> <td>900</td> <td>370</td> </tr> <tr> <td>70.866</td> <td>70.866</td> <td>70.866</td> <td>70.866</td> <td>59.055</td> <td>35.433</td> <td>14.567</td> </tr> <tr> <td>1,800 (Note 2)</td> <td>1,800 (Note 2)</td> <td>1,800 (Note 2)</td> <td>1,800 (Note 2)</td> <td>1,800 (Note 2)</td> <td>1,650</td> <td>—</td> </tr> <tr> <td></td> <td>70.866</td> <td>70.866</td> <td>70.866</td> <td>70.866</td> <td>70.866</td> <td>64.961</td> <td>—</td> </tr> <tr> <td rowspan="3">FT-H30-M1V-S</td> <td>3,600</td> <td>3,600</td> <td>3,600</td> <td>3,400</td> <td>1,500</td> <td>900</td> <td>370</td> </tr> <tr> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>133.858</td> <td>59.055</td> <td>35.433</td> <td>14.567</td> <td>—</td> </tr> <tr> <td>3,600</td> <td>3,600</td> <td>3,600</td> <td>2,500</td> <td>1,650</td> <td>—</td> <td>—</td> </tr> <tr> <td></td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>141.732 (Note 2)</td> <td>98.425</td> <td>64.961</td> <td>—</td> <td>—</td> </tr> </tbody> </table>	Fiber	Mode	Amplifier						FX-500 series (Upper value)			FX-550 / FX-550L series (Lower value)					HYPR	U-LG	LONG	STD	FAST	H-SP	FT-40V	1,800 (Note 2)	1,800 (Note 2)	1,800 (Note 2)	1,800 (Note 2)	1,500	900	370	70.866	70.866	70.866	70.866	59.055	35.433	14.567	1,800 (Note 2)	1,800 (Note 2)	1,800 (Note 2)	1,800 (Note 2)	1,800 (Note 2)	1,650	—		70.866	70.866	70.866	70.866	70.866	64.961	—	FT-H30-M1V-S	3,600	3,600	3,600	3,400	1,500	900	370	141.732 (Note 2)	141.732 (Note 2)	133.858	59.055	35.433	14.567	—	3,600	3,600	3,600	2,500	1,650	—	—		141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	98.425	64.961	—	—
	Fiber	Mode	Amplifier																																																																																		
			FX-500 series (Upper value)			FX-550 / FX-550L series (Lower value)																																																																															
		HYPR	U-LG	LONG	STD	FAST	H-SP																																																																														
FT-40V	1,800 (Note 2)	1,800 (Note 2)	1,800 (Note 2)	1,800 (Note 2)	1,500	900	370																																																																														
	70.866	70.866	70.866	70.866	59.055	35.433	14.567																																																																														
	1,800 (Note 2)	1,800 (Note 2)	1,800 (Note 2)	1,800 (Note 2)	1,800 (Note 2)	1,650	—																																																																														
	70.866	70.866	70.866	70.866	70.866	64.961	—																																																																														
FT-H30-M1V-S	3,600	3,600	3,600	3,400	1,500	900	370																																																																														
	141.732 (Note 2)	141.732 (Note 2)	133.858	59.055	35.433	14.567	—																																																																														
	3,600	3,600	3,600	2,500	1,650	—	—																																																																														
	141.732 (Note 2)	141.732 (Note 2)	141.732 (Note 2)	98.425	64.961	—	—																																																																														
Vacuum-resistant compact side-view lens (Note 1)	FV-SV1	 <p>Beam axis is bent by 90°. • Ambient temperature: -30 to +300 °C -22 to +572 °F (Note 6) • Beam axis dia: \varnothing3 mm \varnothing0.118 in Sensing range (mm in) [Lens on both sides] (Note 3, 4)</p> <table border="1"> <thead> <tr> <th rowspan="2">Fiber</th> <th rowspan="2">Mode</th> <th colspan="6">Amplifier</th> </tr> <tr> <th colspan="3">FX-500 series (Upper value)</th> <th colspan="3">FX-550 / FX-550L series (Lower value)</th> </tr> <tr> <th></th> <th></th> <th>HYPR</th> <th>U-LG</th> <th>LONG</th> <th>STD</th> <th>FAST</th> <th>H-SP</th> </tr> </thead> <tbody> <tr> <td rowspan="3">FT-40V</td> <td>1,800 (Note 2)</td> <td>900</td> <td>700</td> <td>450</td> <td>290</td> <td>90</td> <td>—</td> </tr> <tr> <td>70.866</td> <td>35.433</td> <td>27.559</td> <td>17.717</td> <td>11.417</td> <td>3.543</td> <td>—</td> </tr> <tr> <td>1,800 (Note 2)</td> <td>1,800 (Note 2)</td> <td>1,050</td> <td>720</td> <td>430</td> <td>—</td> <td>—</td> </tr> <tr> <td></td> <td>70.866</td> <td>70.866</td> <td>41.339</td> <td>28.346</td> <td>16.929</td> <td>—</td> <td>—</td> </tr> </tbody> </table>	Fiber	Mode	Amplifier						FX-500 series (Upper value)			FX-550 / FX-550L series (Lower value)					HYPR	U-LG	LONG	STD	FAST	H-SP	FT-40V	1,800 (Note 2)	900	700	450	290	90	—	70.866	35.433	27.559	17.717	11.417	3.543	—	1,800 (Note 2)	1,800 (Note 2)	1,050	720	430	—	—		70.866	70.866	41.339	28.346	16.929	—	—																															
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- Notes: 1) Be careful when installing the thru-beam type fiber equipped with the lens, as the beam envelope becomes narrow and alignment is difficult.
 2) The fiber cable length practically limits the sensing range.
 3) **FX-550L** series does not have FAST mode.
 4) The fiber cable length for the **FT-40V** is 1 m **3.281 ft**. The sensing ranges take into account the length of the **FT-J9** atmospheric side fiber.
 5) The fiber cable length for the **FT-H30-M1V-S** is 1 m **3.281 ft**. The sensing ranges in HYPR, U-LG and LONG of **FX-500 / FX-550 / FX-550L** series are specified considering the length of the **FT-J8** atmospheric side fiber.
 6) Refer to **LIST OF FIBERS** (p.25~) for the ambient temperature of fibers to be used in combination.

FIBER OPTIONS

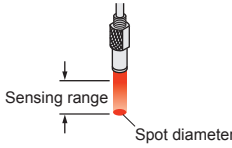

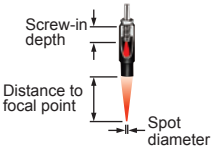
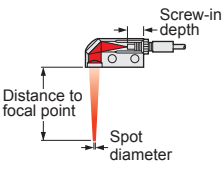
Lens (For reflective type fiber)

Designation	Model No.	Description														
For reflective type fiber	Finest spot lens		<p>Extremely fine spot of $\varnothing 0.1$ mm $\varnothing 0.004$ in approx. achieved.</p> <ul style="list-style-type: none"> Applicable fibers: FD-R33EG, FD-EG31, FD-R34EG, FD-R32EG, FD-EG30, FD-R31G, FD-42G, FD-42GW, FD-32G, FD-32GX Ambient temperature: -55 to $+70$ °C $+67$ to $+158$ °F (Note) 	<p>Sensing range for FX-500 / FX-550 / FX-550L series</p> <table border="1"> <thead> <tr> <th>Fiber model No.</th> <th>Distance to focal point</th> <th>Spot diameter</th> </tr> </thead> <tbody> <tr> <td>FD-R33EG FD-EG31</td> <td rowspan="5">7 \pm 0.5 mm 0.276 \pm 0.020 in</td> <td>$\varnothing 0.1$ mm approx. $\varnothing 0.004$ in approx.</td> </tr> <tr> <td>FD-R34EG</td> <td>$\varnothing 0.15$ mm approx. $\varnothing 0.006$ in approx.</td> </tr> <tr> <td>FD-R32EG FD-EG30</td> <td>$\varnothing 0.2$ mm approx. $\varnothing 0.008$ in approx.</td> </tr> <tr> <td>FD-R31G FD-42G/42GW FD-32G/32GX</td> <td>$\varnothing 0.4$ mm approx. $\varnothing 0.016$ in approx.</td> </tr> </tbody> </table>	Fiber model No.	Distance to focal point	Spot diameter	FD-R33EG FD-EG31	7 \pm 0.5 mm 0.276 \pm 0.020 in	$\varnothing 0.1$ mm approx. $\varnothing 0.004$ in approx.	FD-R34EG	$\varnothing 0.15$ mm approx. $\varnothing 0.006$ in approx.	FD-R32EG FD-EG30	$\varnothing 0.2$ mm approx. $\varnothing 0.008$ in approx.	FD-R31G FD-42G/42GW FD-32G/32GX	$\varnothing 0.4$ mm approx. $\varnothing 0.016$ in approx.
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Zoom lens			<p>The spot diameter is adjustable according to how much the fiber is screwed in.</p> <ul style="list-style-type: none"> Applicable fibers: FD-R33EG, FD-EG31, FD-R34EG, FD-R32EG, FD-EG30, FD-R31G, FD-32G, FD-32GX Ambient temperature: -55 to $+70$ °C $+67$ to $+158$ °F (Note) 	<p>Sensing range for FX-500 / FX-550 / FX-550L series</p> <table border="1"> <thead> <tr> <th>Fiber model No.</th> <th>Sensing range</th> <th>Spot diameter</th> </tr> </thead> <tbody> <tr> <td>FD-R33EG FD-EG31</td> <td rowspan="5">10 to 30 mm 0.394 to 1.181 in</td> <td>$\varnothing 0.4$ to $\varnothing 2.0$ mm approx. $\varnothing 0.016$ to $\varnothing 0.079$ in approx.</td> </tr> <tr> <td>FD-R34EG</td> <td>$\varnothing 0.4$ to $\varnothing 2.2$ mm approx. $\varnothing 0.016$ to $\varnothing 0.087$ in approx.</td> </tr> <tr> <td>FD-R32EG FD-EG30</td> <td>$\varnothing 0.5$ to $\varnothing 2.5$ mm approx. $\varnothing 0.020$ to $\varnothing 0.098$ in approx.</td> </tr> <tr> <td>FD-R31G FD-32G/32GX</td> <td>$\varnothing 0.8$ to $\varnothing 3.5$ mm approx. $\varnothing 0.031$ to $\varnothing 0.138$ in approx.</td> </tr> </tbody> </table>	Fiber model No.	Sensing range	Spot diameter	FD-R33EG FD-EG31	10 to 30 mm 0.394 to 1.181 in	$\varnothing 0.4$ to $\varnothing 2.0$ mm approx. $\varnothing 0.016$ to $\varnothing 0.079$ in approx.	FD-R34EG	$\varnothing 0.4$ to $\varnothing 2.2$ mm approx. $\varnothing 0.016$ to $\varnothing 0.087$ in approx.	FD-R32EG FD-EG30	$\varnothing 0.5$ to $\varnothing 2.5$ mm approx. $\varnothing 0.020$ to $\varnothing 0.098$ in approx.	FD-R31G FD-32G/32GX	$\varnothing 0.8$ to $\varnothing 3.5$ mm approx. $\varnothing 0.031$ to $\varnothing 0.138$ in approx.
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Note: Refer to LIST OF FIBERS (p.25~) for the ambient temperature of fibers to be used in combination.

FIBER OPTIONS

Lens (For reflective type fiber)

Designation	Model No.	Description														
For reflective type fiber	Parallel light lens	FX-MR9	 <p>Long-range parallel light</p> <ul style="list-style-type: none"> Applicable fibers: FD-R33EG, FD-EG31, FD-R34EG, FD-R32EG, FD-EG30, FD-R31G, FD-42G, FD-42GW, FD-32G, FD-32GX Ambient temperature: -55 to +70 °C +67 to +158 °F (Note) 	Sensing range for FX-500 / FX-550 / FX-550L series <table border="1"> <thead> <tr> <th>Fiber model No.</th> <th>Sensing range</th> <th>Spot diameter</th> </tr> </thead> <tbody> <tr> <td>FD-R33EG FD-EG31</td> <td rowspan="4">0 to 30 mm 0.394 to 1.181 in</td> <td rowspan="4">ø4.0 mm approx. ø0.157 in approx.</td> </tr> <tr> <td>FD-R34EG</td> </tr> <tr> <td>FD-R32EG FD-EG30</td> </tr> <tr> <td>FD-R31G FD-42G/42GW FD-32G/32GX</td> </tr> </tbody> </table>		Fiber model No.	Sensing range	Spot diameter	FD-R33EG FD-EG31	0 to 30 mm 0.394 to 1.181 in	ø4.0 mm approx. ø0.157 in approx.	FD-R34EG	FD-R32EG FD-EG30	FD-R31G FD-42G/42GW FD-32G/32GX		
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FD-R32EG FD-EG30																
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Pinpoint spot lens	FX-MR1	 <p>Pinpoint spot of ø0.5 mm ø0.020 in. Enables detection of minute objects or small marks.</p> <ul style="list-style-type: none"> Distance to focal point: 6 ± 1 mm 0.236 ± 0.039 in Applicable fibers: FD-42G, FD-42GW Ambient temperature: -40 to +70 °C -40 to +158 °F (Note) 														
Zoom lens	FX-MR2	 <p>The spot diameter is adjustable from ø0.7 to ø2 mm ø0.028 to ø0.079 in according to how much the fiber is screwed in.</p> <ul style="list-style-type: none"> Applicable fibers: FD-42G, FD-42GW Ambient temperature: -40 to +70 °C -40 to +158 °F (Note) Accessory: MS-EX3 (mounting bracket) 	Sensing range for FX-500 / FX-550 / FX-550L series <table border="1"> <thead> <tr> <th>Screw-in depth</th> <th>Distance to focal point</th> <th>Spot diameter</th> </tr> </thead> <tbody> <tr> <td>7 mm 0.276 in</td> <td>18.5 mm approx. 0.728 in approx.</td> <td>ø0.7 mm approx. ø0.028 in approx.</td> </tr> <tr> <td>12 mm 0.472 in</td> <td>27 mm approx. 1.063 in approx.</td> <td>ø1.2 mm approx. ø0.047 in approx.</td> </tr> <tr> <td>14 mm 0.551 in</td> <td>43 mm approx. 1.693 in approx.</td> <td>ø2.0 mm approx. ø0.079 in approx.</td> </tr> </tbody> </table>		Screw-in depth	Distance to focal point	Spot diameter	7 mm 0.276 in	18.5 mm approx. 0.728 in approx.	ø0.7 mm approx. ø0.028 in approx.	12 mm 0.472 in	27 mm approx. 1.063 in approx.	ø1.2 mm approx. ø0.047 in approx.	14 mm 0.551 in	43 mm approx. 1.693 in approx.	ø2.0 mm approx. ø0.079 in approx.
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14 mm 0.551 in	43 mm approx. 1.693 in approx.	ø2.0 mm approx. ø0.079 in approx.														
Zoom lens (side-view type)	FX-MR5	 <p>FX-MR2 is converted into a side-view type and can be mounted in a very small space.</p> <ul style="list-style-type: none"> Applicable fibers: FD-42G, FD-42GW Ambient temperature: -40 to +60 °C -40 to +140 °F (Note) 	Sensing range for FX-500 / FX-550 / FX-550L series <table border="1"> <thead> <tr> <th>Screw-in depth</th> <th>Distance to focal point</th> <th>Spot diameter</th> </tr> </thead> <tbody> <tr> <td>8 mm 0.315 in</td> <td>13 mm approx. 0.512 in approx.</td> <td>ø0.5 mm approx. ø0.020 in approx.</td> </tr> <tr> <td>10 mm 0.394 in</td> <td>15 mm approx. 0.591 in approx.</td> <td>ø0.8 mm approx. ø0.031 in approx.</td> </tr> <tr> <td>14 mm 0.551 in</td> <td>30 mm approx. 1.181 in approx.</td> <td>ø3.0 mm approx. ø0.118 in approx.</td> </tr> </tbody> </table>		Screw-in depth	Distance to focal point	Spot diameter	8 mm 0.315 in	13 mm approx. 0.512 in approx.	ø0.5 mm approx. ø0.020 in approx.	10 mm 0.394 in	15 mm approx. 0.591 in approx.	ø0.8 mm approx. ø0.031 in approx.	14 mm 0.551 in	30 mm approx. 1.181 in approx.	ø3.0 mm approx. ø0.118 in approx.
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Note: Refer to [LIST OF FIBERS](#) (p.25~) for the ambient temperature of fibers to be used in combination.