

Thru-beam type Threaded type	Thru-beam type Cylindrical type	Thru-beam type Rectangular type	Thru-beam type Narrow beam / Wide beam	Thru-beam type Array / Heat-resistant	Thru-beam type Chemical-resistant / Vacuum resistant	Retroreflective type	Reflective type Threaded type	Reflective type Cylindrical type	Reflective type Rectangular type	Reflective type Wide beam	Reflective type Liquid detection	Reflective type Heat-resistant / Vacuum resistant
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## LIST OF FIBERS

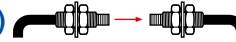
### Red LED type sensing range

#### Super quality fiber thru-beam type (one pair set)



Type	Shape of fiber head (mm in)	Model No.	Sensing range (mm in) (Note 1)		
			FX-500 series	FX-101 (Upper value) FX-102 (Lower value)	
Thru-beam type	Thru-beam type	M4	Sensing range (mm in) (Note 1)		
	Cylindrical type	ø3 ø0.118	Sensing range (mm in) (Note 1)		
			■ : HYPR ■ : U-LG ■ : LONG ■ : STDF ■ : STD ■ : FAST ■ : H-SP ■ : S-D		
			Dual display digital standard type	Dual display digital	
Thru-beam type	Thru-beam type	M3	Sensing range (mm in) (Note 1)		
	Cylindrical type	ø1.5 ø0.059	Sensing range (mm in) (Note 1)		
			■ : HYPR ■ : U-LG ■ : LONG ■ : STDF ■ : STD ■ : FAST ■ : H-SP ■ : S-D		
			Dual display digital standard type	Dual display digital	

#### New standard fiber thru-beam type (one pair set)



Type	Shape of fiber head (mm in)	Model No.	Sensing range (mm in) (Note 1)		
			FX-500 series	FX-101 (Upper value) FX-102 (Lower value)	
Thru-beam type	Thru-beam type	M4	Sensing range (mm in) (Note 1)		
	Cylindrical type	ø1.5 ø0.059	Sensing range (mm in) (Note 1)		
			■ : HYPR ■ : U-LG ■ : LONG ■ : STDF ■ : STD ■ : FAST ■ : H-SP ■ : S-D		
			Dual display digital standard type	Dual display digital	
Thru-beam type	Thru-beam type	M3	Sensing range (mm in) (Note 1)		
	Cylindrical type	ø0.25 ø0.010	Sensing range (mm in) (Note 1)		
			■ : HYPR ■ : U-LG ■ : LONG ■ : STDF ■ : STD ■ : FAST ■ : H-SP ■ : S-D		
			Dual display digital standard type	Dual display digital	

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 to 3,600 mm 141.732 in long.  
 3) Please contact our office about the sensing range for the FX-301-HS.

2 m 6.562 ft	Fiber cable length/ Free cut	R4 mm R0.157 in	Allowable bending radius	10 million Times	Bending durability	-55 to +80 °C -67 to +176 °F	Ambient temperature	±10 %	Optical transmission loss
150 μm ±2 °	Beam axis position/ Inclination of beam axis	IP67	Protective structure						

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	FX-301 / FX-301-HS (Note 3) / FX-311 (Only LONG/STD/S-D for FX-311)	FX-305	FX-411 / FX-412	Beam axis dia. (mm in)	Specifications
	General purpose / High-speed / Sensitivity types	FX-301's 2 output type	Digital dual display + Adjuster operation		
				<p>ø1 ø0.039</p>	<p>2 m 6.562 ft</p> <p>R4 mm R0.157 in</p> <p>10 million Times</p> <p>-55 to +80 °C -67 to +176 °F</p> <p>±10 %</p> <p>150 μm/ ±2 °</p>
				<p>ø0.5 ø0.020</p>	
				<p>ø1 ø0.039</p>	
				<p>ø0.5 ø0.020</p>	

	FX-301 / FX-301-HS (Note 3) / FX-311 (Only LONG/STD/S-D for FX-311)	FX-305	FX-411 / FX-412	Beam axis dia. (mm in)	Specifications
	General purpose / High-speed / Sensitivity types	FX-301's 2 output type	Digital dual display + Adjuster operation		
				<p>ø1 ø0.039</p>	<p>R4 mm R0.157 in</p> <p>2 m 6.562 ft</p> <p>10 million Times</p> <p>-55 to +80 °C -67 to +176 °F</p> <p>150 μm/ ±2 °</p> <p>IP67</p> <p>R2 mm R0.079 in</p> <p>1 m 3.281 ft</p> <p>10 million Times</p> <p>-40 to +70 °C -40 to +158 °F</p> <p>90 μm/ ±5 °</p> <p>IP67</p>
				<p>ø0.5 ø0.020</p>	
				<p>ø0.125 ø0.005</p>	
				<p>ø0.25 ø0.010</p>	

● Each amplifier response time (Red LED type)	HYPR	U-LG	LONG	STDF	STD	FAST	H-SP	S-D
<b>FX-500 series</b>	24 ms	4 ms	2 ms	—	250 μs	60 μs	25 μs	—
<b>FX-101 / FX-102 (Note)</b>	—	—	—	—	250 μs / 2.5 ms	—	—	—
<b>FX-301 / FX-301-HS</b>	—	—	2 ms	—	250 μs	150 μs	65 μs / 35 μs	250 μs
<b>FX-305</b>	—	4.5 ms	2.5 ms	700 μs	250 μs	150 μs	65 μs	—
<b>FX-411 / FX-412</b>	—	4.5 ms	—	—	500 μs	150 μs	—	—
<b>FX-311</b>	—	—	2 ms	—	250 μs	—	—	250 μs

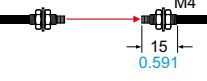
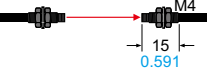
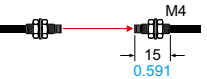
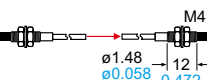
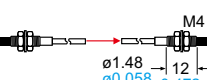
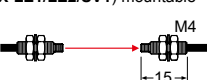
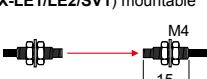

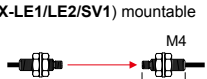
Note: For the FX-100 series response times, FX-101's response frequency is 0, and FX-102's response frequency is 1.

Thru-beam type Threaded type	Thru-beam type Cylindrical type	Thru-beam type Rectangular type	Thru-beam type Narrow beam / Wide beam	Thru-beam type Array / Heat-resistant	Thru-beam type Chemical-resistant / Vacuum resistant	Retroreflective type	Reflective type Threaded type	Reflective type Cylindrical type	Reflective type Rectangular type	Reflective type Wide beam	Reflective type Liquid detection	Reflective type Heat-resistant / Vacuum resistant
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## LIST OF FIBERS

### Red LED type sensing range

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

Type	Shape of fiber head (mm in)	Model No.	Sensing range (mm in) (Note 1)		
			■ : HYPR ■ : U-LG ■ : LONG ■ : STDF ■ : STD ■ : FAST ■ : H-SP ■ : S-D		
			FX-500 series		FX-101 (Upper value) FX-102 (Lower value)
Dual display digital standard type		Dual display digital			
Thru-beam type M4	Lens (FX-LE1/LE2/SV1) mountable 	FT-B8	(Note 2) 3,600 141.732 2,400 94.488 2,100 82.677 1,250 49.213 570 22.441 180 7.087	400 15.748 1,150 45.276	
	Metal-free 	FT-41			
	Lens (FX-LE1/LE2/SV1) mountable 	FT-FM2	3,300 129.921 2,000 78.740 1,550 61.024 1,100 43.307	300 11.811	
	Sleeve 90 mm 3.543 in 	FT-FM2S	445 17.520 150 5.906	800 31.496	
	Sleeve 40 mm 1.575 in 	FT-FM2S4			
	Lens (FX-LE1/LE2/SV1) mountable 	FT-W8	3,300 129.921 1,800 70.866 1,400 55.118 790 31.102 420 16.535 140 5.512	260 10.236 650 25.591	
	Lens (FX-LE1/LE2/SV1) mountable 	FT-P80	3,300 129.921 2,000 78.740 1,500 59.055 810 31.890 470 18.504 160 6.299	230 9.055 650 25.591	
	Lens (FX-LE1/LE2/SV1) mountable Tough flexible 	FT-P81X	1,600 62.992 1,600 62.992 1,600 62.992 880 34.646 530 20.866 160 6.299	260 10.236 800 31.496	
	Lens (FX-LE1/LE2/SV1) mountable 	FT-P60	1,200 47.244 640 25.197 560 22.047 350 13.780 210 8.268 60 2.362	130 5.118 300 11.811	

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 to 3,600 mm 141.732 in long.

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Pliable fibers (flexible and sharp bending fibers) are marked with light blue in the table.

	FX-301 / FX-301-HS / FX-311 (Only LONG/STD/S-D for FX-311)	FX-305	FX-411 / FX-412	Beam axis dia. (mm in)	Fiber cable length ✂ : Free cut	Bending radius	Ambient temperature
	General purpose / High-speed / Sensitivity types	FX-301's 2 output type	Digital dual display + Adjuster operation				
	<p>1,100 43.307 530 20.866 400 15.748 200 7.874 (FX-301-HS: 120 4.724) 180 7.087</p>	<p>1,600 62.992 1,100 43.307 700 27.559 530 20.866 400 15.748 200 7.874</p>	<p>2,000 78.740 530 20.866 400 15.748</p>	ø1.5 ø0.059			
	<p>780 30.709 400 15.748 280 11.024 150 5.906 (FX-301-HS: 90 3.543) 130 5.118</p>	<p>1,000 39.370 780 30.709 500 19.685 400 15.748 280 11.024 150 5.906</p>	<p>1,500 59.055 340 13.386 240 9.449</p>	ø1 ø0.039	✂ 2 m 6.562 ft	R25 mm R0.984 in	-40 to +70 °C -40 to +158 °F
	<p>570 22.441 290 11.417 200 7.874 90 3.543 (FX-301-HS: 50 1.969) 100 3.937</p>	<p>750 29.528 570 22.441 350 13.780 290 11.417 200 7.874 90 3.543</p>	<p>950 37.402 290 11.417 200 7.874</p>			R1 mm R0.039 in	-40 to +60 °C -40 to +140 °F
	<p>650 25.591 320 12.598 230 9.055 100 3.937 (FX-301-HS: 60 2.362) 110 4.331</p>	<p>900 35.433 650 25.591 400 15.748 320 12.598 230 9.055 100 3.937</p>	<p>1,000 39.370 230 9.055 170 6.693</p>	ø1.4 ø0.055		R4 mm R0.157 in Flexible	-40 to +70 °C -40 to +158 °F
	<p>650 25.591 320 12.598 230 9.055 100 3.937 (FX-301-HS: 60 2.362) 110 4.331</p>	<p>900 35.433 650 25.591 380 14.961 320 12.598 230 9.055 100 3.937</p>	<p>1,200 47.244 320 12.598 230 9.055</p>		1 m 3.281 ft	R10 mm R0.394 in	-40 to +60 °C
	<p>400 15.748 190 7.480 140 5.512 70 2.756 (FX-301-HS: 42 1.654) 80 3.150</p>	<p>550 21.654 400 15.748 250 9.843 190 7.480 140 5.512 70 2.756</p>	<p>600 23.622 140 5.512 100 3.937</p>	ø0.7 ø0.028	✂ 2 m 6.562 ft	R4 mm R0.157 in Flexible	-40 to +140 °F

● Each amplifier response time (Red LED type)	HYPR	U-LG	LONG	STDF	STD	FAST	H-SP	S-D
FX-500 series	24 ms	4 ms	2 ms	—	250 μs	60 μs	25 μs	—
FX-101 / FX-102 (Note)	—	—	—	—	250 μs / 2.5 ms	—	—	—
FX-301 / FX-301-HS	—	—	2 ms	—	250 μs	150 μs	65 μs / 35 μs	250 μs
FX-305	—	4.5 ms	2.5 ms	700 μs	250 μs	150 μs	65 μs	—
FX-411 / FX-412	—	4.5 ms	—	—	500 μs	150 μs	—	—
FX-311	—	—	2 ms	—	250 μs	—	—	250 μs

Note: For the FX-100 series response times, FX-101's response frequency is 0, and FX-102's response frequency is 1.

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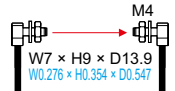
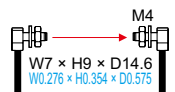
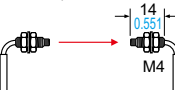
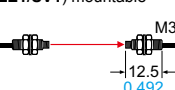
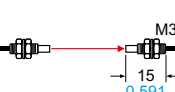
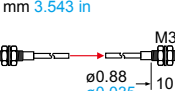
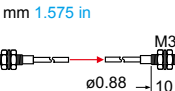
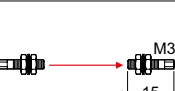
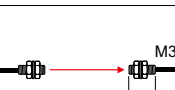
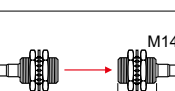
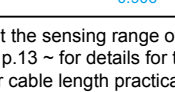



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Thru-beam type Threaded type	Thru-beam type Cylindrical type	Thru-beam type Rectangular type	Thru-beam type Narrow beam / Wide beam	Thru-beam type Array / Heat-resistant	Thru-beam type Chemical-resistant / Vacuum resistant	Retroreflective type	Reflective type Threaded type	Reflective type Cylindrical type	Reflective type Rectangular type	Reflective type Wide beam	Reflective type Liquid detection	Reflective type Heat-resistant / Vacuum resistant
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### Red LED type sensing range

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

Type	Shape of fiber head (mm in)	Model No.	Sensing range (mm in) (Note 1)			
			■ : HYPR ■ : U-LG ■ : LONG ■ : STDF ■ : STD ■ : FAST ■ : H-SP ■ : S-D			
			FX-500 series		FX-101 (Upper value) FX-102 (Lower value)	
Dual display digital standard type		Dual display digital				
Thru-beam type	Square head type	 W7 × H9 × D13.9 W0.276 × H0.354 × D0.547 M4	<b>FT-WR80</b> (Note 2)	2,600 102.362	215 8.465	
				1,300 51.181		
	With lens		 W7 × H9 × D14.6 W0.276 × H0.354 × D0.575 M4	<b>FT-WR80L</b> (Note 2)	(Note 3) 3,600 141.732	430 16.929
	(Note 3) 3,600 141.732					
	Elbow	 Lens (FX-LE1/LE2) mountable 14 0.551 M4	<b>FT-R80</b>	3,300 129.921	180 7.087	
				1,750 68.898		
	Thru-beam type	M3	 Lens (FX-LE1/SV1) mountable 12.5 0.492 M3	<b>FT-T80</b>	3,500 137.795	300 11.811
					1,750 68.898	
			 M3 15 0.591	<b>FT-NFM2</b>	3,300 129.921	800 31.496
					2,000 78.740	
 Sleeve 90 mm 3.543 in M3 10 0.394 ø0.88 ø0.035			<b>FT-NFM2S</b>	1,550 61.024	130 5.118	
				1,100 43.307		
 Sleeve 40 mm 1.575 in M3 10 0.394 ø0.88 ø0.035			<b>FT-NFM2S4</b>	780 30.709	280 11.024	
				450 17.717		
 M3 15 0.591	<b>FT-W4</b>	140 5.512	80 3.150			
		3,300 129.921				
 M3 10 0.394	<b>FT-P40</b>	960 37.795	220 8.661			
		590 23.228				
 M3 10 0.394	<b>FT-P40</b>	440 17.323	80 3.150			
		250 9.843				
 With lens M14 23 0.906	<b>FT-FM10L</b>	150 5.906	240 9.449			
		53 2.087				
 With lens M14 23 0.906	<b>FT-FM10L</b>	650 25.591	15,000 590.551			
		360 14.173				
 With lens M14 23 0.906	<b>FT-FM10L</b>	270 10.630	9,300 366.142			
		160 6.299				
 With lens M14 23 0.906	<b>FT-FM10L</b>	95 3.740	19,600 771.654			
		30 1.181				
 With lens M14 23 0.906	<b>FT-FM10L</b>	(Note 3) 19,600 771.654	19,600 771.654			
		(Note 3) 19,600 771.654				
 With lens M14 23 0.906	<b>FT-FM10L</b>	(Note 3) 19,600 771.654	19,600 771.654			
		(Note 3) 19,600 771.654				
 With lens M14 23 0.906	<b>FT-FM10L</b>	13,000 511.811	15,000 590.551			
		4,000 157.480				

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) Refer to p.13 ~ for details for the **FT-WR80/WR80L**.

3) The fiber cable length practically limits the sensing range to 3,600 mm 141.732 in or 19,600 mm 771.654 in, 19,500 mm 767.717 in long.

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Pliable fibers (flexible and sharp bending fibers) are marked with light blue in the table.

	FX-301 / FX-301-HS / FX-311 (Only LONG/STD/S-D for FX-311)	FX-305	FX-411 / FX-412	Beam axis dia. (mm in)	Fiber cable length ✂ : Free cut	Bending radius	Ambient temperature
	General purpose / High-speed / Sensitivity types	FX-301's 2 output type	Digital dual display + Adjuster operation				
	570 22.441 290 11.417 200 7.874 90 3.543 (FX-301-HS: —) 100 3.937	750 29.528 570 22.441 350 13.780 290 11.417 200 7.874 90 3.543	950 37.402 290 11.417 200 7.874	ø1 ø0.039		R1 mm R0.039 in	-40 to +60 °C -40 to +140 °F
	1,200 47.244 600 23.622 420 16.535 200 7.874 (FX-301-HS: —) 210 8.268	1,500 59.055 1,200 47.244 750 29.528 600 23.622 420 16.535 200 7.874	2,100 82.677 600 23.622 400 15.748	ø2 ø0.079			
	530 20.866 230 9.055 150 5.906 75 2.953 (FX-301-HS: 45 1.772) 80 3.150	740 29.134 530 20.866 320 12.598 230 9.055 150 5.906 75 2.953	630 24.803 160 6.299 110 4.331	ø1 ø0.039			
	780 30.709 400 15.748 280 11.024 150 5.906 (FX-301-HS: 90 3.543) 130 5.118	1,000 39.370 780 30.709 500 19.685 400 15.748 280 11.024 150 5.906	1,500 59.055 340 13.386 240 9.449	ø1 ø0.039		R25 mm R0.984 in	
	270 10.630 140 5.512 100 3.937 55 2.165 (FX-301-HS: 33 1.299) 49 1.929	400 15.748 270 10.630 200 7.874 140 5.512 100 3.937 55 2.165	450 17.717 130 5.118 85 3.346	ø0.5 ø0.020	✂ 2 m 6.562 ft	Fiber R25 mm R0.984 in Sleeve R10 mm R0.394 in	-40 to +70 °C -40 to +158 °F
	160 6.299 80 3.150 55 2.165 25 0.984 (FX-301-HS: 15 0.591) 28 1.102	220 8.661 160 6.299 100 3.937 80 3.150 55 2.165 25 0.984	250 9.843 65 2.559 45 1.772			R1 mm R0.039 in	-40 to +60 °C -40 to +140 °F
	250 9.843 100 3.937 75 2.953 30 1.181 (FX-301-HS: 18 0.709) 35 1.378	350 13.780 250 9.843 150 5.906 100 3.937 75 2.953 30 1.181	210 8.268 58 2.283 43 1.693	ø0.6 ø0.024		R4 mm R0.157 in Flexible	-40 to +70 °C
	(Note 3) 19,500 767.717 14,000 551.181 10,000 393.701 3,500 137.795 (FX-301-HS: 2,100 82.677) 3,800 149.606	(Note 3) 19,500 767.717 (Note 3) 19,500 767.717 (Note 3) 19,500 767.717 14,000 551.181 10,000 393.701 3,500 137.795	(Note 3) 19,500 767.717 10,000 393.701 8,000 314.961	ø10 ø0.394	✂ 10 m 32.808 ft	R25 mm R0.984 in	-40 to +158 °F

● Each amplifier response time (Red LED type)	HYPR	U-LG	LONG	STDF	STD	FAST	H-SP	S-D
FX-500 series	24 ms	4 ms	2 ms	—	250 µs	60 µs	25 µs	—
FX-101 / FX-102 (Note)	—	—	—	—	250 µs / 2.5 ms	—	—	—
FX-301 / FX-301-HS	—	—	2 ms	—	250 µs	150 µs	65 µs / 35 µs	250 µs
FX-305	—	4.5 ms	2.5 ms	700 µs	250 µs	150 µs	65 µs	—
FX-411 / FX-412	—	4.5 ms	—	—	500 µs	150 µs	—	—
FX-311	—	—	2 ms	—	250 µs	—	—	250 µs

Note: For the FX-100 series response times, FX-101's response frequency is 0, and FX-102's response frequency is 1.

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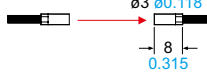
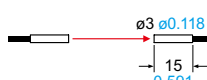
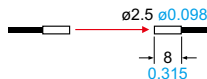
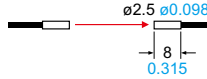
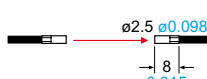
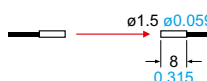
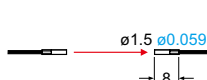
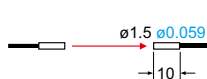
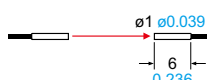
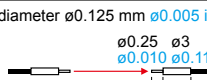
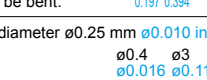
FT/FD/FR

Thru-beam type Threaded type	Thru-beam type Cylindrical type	Thru-beam type Rectangular type	Thru-beam type Narrow beam / Wide beam	Thru-beam type Array / Heat-resistant	Thru-beam type Chemical-resistant / Vacuum resistant	Retroreflective type	Reflective type Threaded type	Reflective type Cylindrical type	Reflective type Rectangular type	Reflective type Wide beam	Reflective type Liquid detection	Reflective type Heat-resistant / Vacuum resistant
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## LIST OF FIBERS

### Red LED type sensing range

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

Type	Shape of fiber head (mm in)	Model No.	Sensing range (mm in) (Note 1)		
			■ : HYP ■ : U-LG ■ : LONG ■ : STDF ■ : STD ■ : FAST ■ : H-SP ■ : S-D		
			FX-500 series	FX-101 (Upper value)	FX-102 (Lower value)
Cylindrical type	With lens • Long sensing range 	FT-WS8L	(Note 2) 3,600 141.732	600 23.622	1,500 59.055
			(Note 2) 3,600 141.732		
		FT-WS3	3,300 129.921	150 5.906	600 23.622
			1,900 74.803		
	With lens • Long sensing range 	FT-SFM2L	(Note 2) 3,600 141.732	760 29.921	2,400 94.488
			(Note 2) 3,600 141.732		
			3,500 137.795		
			2,600 102.362		
		FT-SFM2	3,300 129.921	300 11.811	800 31.496
			2,000 78.740		
		FT-WS8	1,550 61.024	260 10.236	650 25.591
			1,100 43.307		
			445 17.520		
		FT-SNFM2	3,300 129.921	130 5.118	280 11.024
1,800 70.866					
740 29.134					
	FT-WS4	1,220 48.031	80 3.150	220 8.661	
		740 29.134			
		545 21.457			
	FT-P2	960 37.795	120 4.724	330 12.992	
		590 23.228			
		440 17.323			
	FT-PS1	350 13.780	40 1.575	90 3.543	
		210 8.268			
Ultra small diameter	Beam diameter ø0.125 mm ø0.005 in  Sleeve part cannot be bent.	FT-E12	---		
			6 0.236		
Ultra small diameter	Beam diameter ø0.25 mm ø0.010 in  Sleeve part cannot be bent.	FT-E22	---		
			15 0.591		
					60 2.362

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 to 3,600 mm 141.732 in or 3,500 mm 137.795 in long.

Pliable fibers (flexible and sharp bending fibers) are marked with light blue in the table.

	FX-301 / FX-301-HS / FX-311 (Only LONG/STD/S-D for FX-311)	FX-305	FX-411 / FX-412	Beam axis dia. (mm in)	Fiber cable length ✂ : Free cut	Bending radius	Ambient temperature
	General purpose / High-speed / Sensitivity types	FX-301's 2 output type	Digital dual display + Adjuster operation				
	1,200 47.244 600 23.622 420 16.535 200 7.874 (FX-301-HS: 120 4.724) 210 8.268	1,500 59.055 1,200 47.244 750 29.528 600 23.622 420 16.535 200 7.874	2,100 82.677 600 23.622 400 15.748	ø2 ø0.079	2 m 6.562 ft	R1 mm R0.039 in	-40 to +60 °C -40 to +140 °F
	570 22.441 290 11.417 200 7.874 90 3.543 (FX-301-HS: —) 100 3.937	780 30.709 570 22.441 340 13.386 290 11.417 200 7.874 90 3.543	950 37.402 290 11.417 200 7.874	ø1 ø0.039	2 m 6.562 ft		
	1,600 62.992 800 31.496 580 22.835 170 6.693 (FX-301-HS: 100 3.937) 280 11.024	2,000 78.740 1,600 62.992 820 32.283 800 31.496 580 22.835 170 6.693	(Note 2) 3,500 137.795 800 31.496 580 22.835	ø2 ø0.079	2 m 6.562 ft	R25 mm R0.984 in	-40 to +70 °C -40 to +158 °F
	780 30.709 400 15.748 280 11.024 150 5.906 (FX-301-HS: 90 3.543) 130 5.118	1,000 39.370 780 30.709 500 19.685 400 15.748 280 11.024 150 5.906	1,500 59.055 340 13.386 240 9.449	ø1 ø0.039	2 m 6.562 ft		
	570 22.441 290 11.417 200 7.874 90 3.543 (FX-301-HS: 50 1.969) 100 3.937	750 29.528 570 22.441 350 13.780 290 11.417 200 7.874 90 3.543	950 37.402 290 11.417 200 7.874			R1 mm R0.039 in	-40 to +60 °C -40 to +140 °F
	270 10.630 140 5.512 100 3.937 55 2.165 (FX-301-HS: 33 1.299) 49 1.929	400 15.748 270 10.630 200 7.874 140 5.512 100 3.937 55 2.165	450 17.717 130 5.118 85 3.346	ø0.5 ø0.020	2 m 6.562 ft	R25 mm R0.984 in	-40 to +70 °C -40 to +158 °F
	160 6.299 80 3.150 55 2.165 25 0.984 (FX-301-HS: 15 0.591) 28 1.102	220 8.661 160 6.299 100 3.937 80 3.150 55 2.165 25 0.984	250 9.843 65 2.559 45 1.772			R1 mm R0.039 in	-40 to +60 °C -40 to +140 °F
	280 11.024 120 4.724 90 3.543 40 1.575 (FX-301-HS: 24 0.945) 42 1.654	350 13.780 280 11.024 160 6.299 120 4.724 90 3.543 40 1.575	315 12.402 80 3.150 60 2.362	ø0.6 ø0.024	1 m 3.281 ft	R4 mm R0.157 in	-40 to +70 °C -40 to +158 °F
	80 3.150 40 1.575 30 1.181 13 0.512 (FX-301-HS: 7 0.276) 17 0.669	100 3.937 80 3.150 50 1.969 40 1.575 30 1.181 13 0.512	105 4.134 25 0.984 19 0.748	ø0.25 ø0.010	500 mm 19.685 in	Flexible	-40 to +60 °C -40 to +140 °F
	18 0.709 10 0.394 8 0.315 3 0.118 (FX-301-HS: 1.5 0.059) 3 0.118	20 0.787 18 0.709 13 0.512 10 0.394 8 0.315 3 0.118	11 0.433 1.5 0.059 1 0.039	ø0.125 ø0.005	500 mm 19.685 in		-40 to +70 °C
	80 3.150 50 1.969 36 1.417 18 0.709 (FX-301-HS: 10 0.394) 15 0.591	130 5.118 80 3.150 60 2.362 50 1.969 36 1.417 18 0.709	60 2.362 15 0.591 10 0.394	ø0.25 ø0.010	1 m 3.281 ft	R5 mm R0.197 in	-40 to +158 °F

● Each amplifier response time (Red LED type)	HYPR	U-LG	LONG	STDF	STD	FAST	H-SP	S-D
FX-500 series	24 ms	4 ms	2 ms	—	250 μs	60 μs	25 μs	—
FX-101 / FX-102 (Note)	—	—	—	—	250 μs / 2.5 ms	—	—	—
FX-301 / FX-301-HS	—	—	2 ms	—	250 μs	150 μs	65 μs / 35 μs	250 μs
FX-305	—	4.5 ms	2.5 ms	700 μs	250 μs	150 μs	65 μs	—
FX-411 / FX-412	—	4.5 ms	—	—	500 μs	150 μs	—	—
FX-311	—	—	2 ms	—	250 μs	—	—	250 μs

Note: For the FX-100 series response times, FX-101's response frequency is 0, and FX-102's response frequency is 1.

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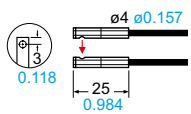
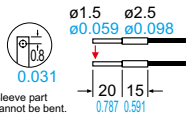
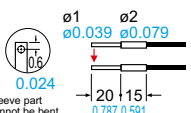
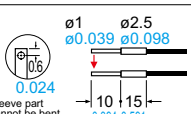
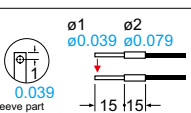

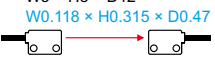
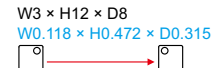
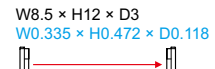
FT/FD/FR



## LIST OF FIBERS

### Red LED type sensing range

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

Type	Shape of fiber head (mm in)	Model No.	Sensing range (mm in) (Note 1)			
			■ : HYPR ■ : U-LG ■ : LONG ■ : STDF ■ : STD ■ : FAST ■ : H-SP ■ : S-D			
			FX-500 series		FX-101 (Upper value) FX-102 (Lower value)	
Dual display digital standard type		Dual display digital				
Cylindrical type Side view		FT-V10	(Note 2) 3,600 141.732	(Note 2) 3,600 141.732	(Note 2) 3,600 141.732	1,000 39.370
		FT-SFM2SV2	2,200 86.614	1,300 51.181	1,000 39.370	180 7.087
		FT-V22	1,200 47.244	600 23.622	490 19.291	140 5.512
		FT-V41	790 31.102	450 17.717	360 14.173	40 1.575
		FT-WV42	380 14.961	220 8.661	170 6.693	30 1.181
		FT-WZ8H	380 14.961	220 8.661	170 6.693	30 1.181
Rectangular type Compact	Easy mounting • Top sensing 	FT-Z8H	(Note 2) 3,600 141.732	(Note 2) 3,600 141.732	(Note 2) 3,600 141.732	1,200 47.244
		FT-Z8H	(Note 2) 3,600 141.732	(Note 2) 3,600 141.732	(Note 2) 3,600 141.732	1,400 55.118
	Easy mounting • Side sensing 	FT-WZ8E	(Note 2) 3,600 141.732	(Note 2) 3,600 141.732	(Note 2) 3,600 141.732	700 27.559
		FT-Z8E	(Note 2) 3,600 141.732	(Note 2) 3,600 141.732	(Note 2) 3,600 141.732	800 31.496
	Easy mounting • Front sensing 	FT-WZ8	(Note 2) 3,600 141.732	(Note 2) 3,100 122.047	(Note 2) 3,100 122.047	330 12.992
		FT-Z8	(Note 2) 3,600 141.732	(Note 2) 2,700 106.299	(Note 2) 2,700 106.299	360 14.173

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 to 3,600 mm 141.732 in or 3,500 mm 137.795 in long.

Pliable fibers (flexible and sharp bending fibers) are marked with light blue in the table.

	FX-301 / FX-301-HS / FX-311 (Only LONG/STD/S-D for FX-311)	FX-305	FX-411 / FX-412	Beam axis dia. (mm in)	Fiber cable length ✂ : Free cut	Bending radius	Ambient temperature
	General purpose / High-speed / Sensitivity types	FX-301's 2 output type	Digital dual display + Adjuster operation				
	2,000 78.740 1,000 39.370 800 31.496 340 13.386 (FX-301-HS: 200 7.874) 350 13.780	2,350 92.520 2,000 78.740 1,400 55.118 1,000 39.370 800 31.496 340 13.386	(Note 2) 3,500 137.795 950 37.402 700 27.559	ø2.5 ø0.098	✂ 2 m 6.562 ft	R25 mm R0.984 in	-40 to +60 °C -40 to +140 °F
	400 15.748 200 7.874 140 5.512 65 2.559 (FX-301-HS: 35 1.378) 70 2.756	550 21.654 400 15.748 240 9.449 200 7.874 140 5.512 65 2.559	600 23.622 150 5.906 110 4.331	ø1.1 ø0.043	✂ 1 m 3.281 ft		
	390 15.354 180 7.087 125 4.921 60 2.362 (FX-301-HS: 35 1.378) 63 2.480	410 16.142 390 15.354 220 8.661 180 7.087 125 4.921 60 2.362	500 19.685 130 5.118 85 3.346	ø0.8 ø0.031	✂ 2 m 6.562 ft	R1 mm R0.039 in	-20 to +60 °C -4 to +140 °F
	175 6.890 80 3.150 60 2.362 25 0.984 (FX-301-HS: 15 0.591) 27 1.063	220 8.661 175 6.890 100 3.937 80 3.150 60 2.362 25 0.984	130 5.118 30 1.181 25 0.984	ø0.55 ø0.022	✂ 2 m 6.562 ft		
	90 3.543 40 1.575 30 1.181 13 0.512 (FX-301-HS: 7 0.276) 15 0.591	120 4.724 90 3.543 55 2.165 40 1.575 30 1.181 13 0.512	68 2.677 15 0.591 12 0.472	ø0.5 ø0.020	✂ 2 m 6.562 ft	R4 mm R0.157 in Flexible	-40 to +60 °C -40 to +140 °F
	2,500 98.425 1,200 47.244 850 33.465 400 15.748 (FX-301-HS: 240 9.449) 410 16.142	(Note 2) 3,500 137.795 2,500 98.425 1,600 62.992 1,200 47.244 850 33.465 400 15.748	(Note 2) 3,500 137.795 700 27.559 500 19.685	2.2 x 3 0.087 x 0.118	✂ 2 m 6.562 ft		
	2,700 106.299 1,400 55.118 1,000 39.370 420 16.535 (FX-301-HS: 250 9.843) 490 19.291	3,100 122.047 2,700 106.299 1,550 61.024 1,400 55.118 1,000 39.370 420 16.535	(Note 2) 3,500 137.795 980 38.583 700 27.559	2.2 x 3 0.087 x 0.118	✂ 2 m 6.562 ft	R4 mm R0.157 in Flexible	-40 to +60 °C -40 to +140 °F
	1,500 59.055 700 27.559 500 19.685 200 7.874 (FX-301-HS: 120 4.724) 210 8.268	2,100 82.677 1,500 59.055 950 37.402 700 27.559 500 19.685 200 7.874	1,900 74.803 500 19.685 350 13.780	2.2 x 3 0.087 x 0.118	✂ 2 m 6.562 ft		
	1,600 62.992 800 31.496 600 23.622 250 9.843 (FX-301-HS: 150 5.906) 280 11.024	1,850 72.835 1,600 62.992 950 37.402 800 31.496 600 23.622 250 9.843	1,900 74.803 600 23.622 400 15.748	2.2 x 3 0.087 x 0.118	✂ 2 m 6.562 ft	R4 mm R0.157 in Flexible	-40 to +60 °C -40 to +140 °F
	700 27.559 330 12.992 240 9.449 100 3.937 (FX-301-HS: 60 2.362) 120 4.724	950 37.402 700 27.559 420 16.535 330 12.992 240 9.449 100 3.937	950 37.402 250 9.843 180 7.087	2.2 x 3 0.087 x 0.118	✂ 2 m 6.562 ft		
	800 31.496 400 15.748 300 11.811 120 4.724 (FX-301-HS: 70 2.756) 140 5.512	1,100 43.307 800 31.496 500 19.685 400 15.748 300 11.811 120 4.724	1,250 49.213 310 12.205 220 8.661	2.2 x 3 0.087 x 0.118	✂ 2 m 6.562 ft	R1 mm R0.039 in	-40 to +60 °C -40 to +140 °F
	800 31.496 400 15.748 300 11.811 120 4.724 (FX-301-HS: 70 2.756) 140 5.512	1,100 43.307 800 31.496 500 19.685 400 15.748 300 11.811 120 4.724	1,250 49.213 310 12.205 220 8.661	2.2 x 3 0.087 x 0.118	✂ 2 m 6.562 ft	R4 mm R0.157 in Flexible	

● Each amplifier response time (Red LED type)	HYPR	U-LG	LONG	STDF	STD	FAST	H-SP	S-D
FX-500 series	24 ms	4 ms	2 ms	—	250 μs	60 μs	25 μs	—
FX-101 / FX-102 (Note)	—	—	—	—	250 μs / 2.5 ms	—	—	—
FX-301 / FX-301-HS	—	—	2 ms	—	250 μs	150 μs	65 μs / 35 μs	250 μs
FX-305	—	4.5 ms	2.5 ms	700 μs	250 μs	150 μs	65 μs	—
FX-411 / FX-412	—	4.5 ms	—	—	500 μs	150 μs	—	—
FX-311	—	—	2 ms	—	250 μs	—	—	250 μs

Note: For the FX-100 series response times, FX-101's response frequency is 0, and FX-102's response frequency is 1.

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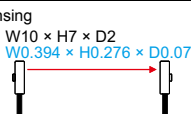
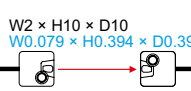
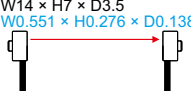
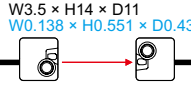

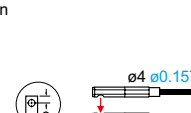
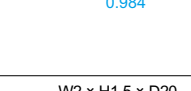

FT/FD/FR

Thru-beam type Threaded type	Thru-beam type Cylindrical type	Thru-beam type Rectangular type	Thru-beam type Narrow beam / Wide beam	Thru-beam type Array / Heat-resistant	Thru-beam type Chemical-resistant / Vacuum resistant	Retroreflective type	Reflective type Threaded type	Reflective type Cylindrical type	Reflective type Rectangular type	Reflective type Wide beam	Reflective type Liquid detection	Reflective type Heat-resistant / Vacuum resistant
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### Red LED type sensing range

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

Type	Shape of fiber head (mm in)	Model No.	Sensing range (mm in) (Note 1)		
			■ : HYPR ■ : U-LG ■ : LONG ■ : STDF ■ : STD ■ : FAST ■ : H-SP ■ : S-D		
			FX-500 series	FX-101 (Upper value)	FX-102 (Lower value)
			Dual display digital standard type	Dual display digital	
Rectangular Compact	Front sensing $W10 \times H7 \times D2$ $W0.394 \times H0.276 \times D0.079$ 	FT-WZ4 (Note 2)	(Note 3) 1,600 62.992 1,100 43.307 900 35.433 530 20.866 330 12.992 100 3.937	230 9.055	670 26.378
	Fiber bending type $W2 \times H10 \times D10$ $W0.079 \times H0.394 \times D0.394$ 	FT-WZ4HB (Note 2)	800 31.496 460 18.110 370 14.567 210 8.268 130 5.118 40 1.575	80 3.150	230 9.055
	Front sensing $W14 \times H7 \times D3.5$ $W0.551 \times H0.276 \times D0.138$ 	FT-WZ7 (Note 2)	3,500 137.795 3,300 129.921 2,300 90.551 1,400 55.118 890 35.039 290 11.417	330 12.992	1,000 39.370
	Fiber bending type $W3.5 \times H14 \times D11$ $W0.138 \times H0.551 \times D0.433$ 	FT-WZ7HB (Note 2)	3,500 137.795 1,700 66.929 1,300 51.181 790 31.102 490 19.291 160 6.299	190 7.480	580 22.835
Special Narrow beam		FT-K8 (Note 4)	(Note 3) 3,600 141.732 (Note 3) 3,600 141.732 (Note 3) 3,600 141.732 (Note 3) 3,600 141.732 2,700 106.299 750 29.528	1,000 39.370	3,000 118.110
	Side-view type with small light dispersion 	FT-WKV8 (Note 4)	(Note 3) 3,600 141.732 (Note 3) 3,600 141.732 (Note 3) 3,600 141.732 (Note 3) 3,600 141.732 2,400 94.488 760 29.921	700 27.559	2,200 86.614
		FT-KV8 (Note 4)	(Note 3) 3,600 141.732 (Note 3) 3,600 141.732 (Note 3) 3,600 141.732 (Note 3) 3,600 141.732 2,700 106.299 750 29.528	1,000 39.370	3,000 118.110
		FT-KV1 (Note 4)	2,400 94.488 1,100 43.307 850 33.465 540 21.260 430 16.929 160 6.299	135 5.315	500 19.685

- 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) Refer to p.13 ~ for details for the FT-WZ4/WZ4HB/WZ7/WZ7HB.  
 3) The fiber cable length practically limits the sensing range to 3,600 mm 141.732 in or 3,500 mm 137.795 in, 1,600 mm 62.992 in long.  
 4) Refer to p.21 ~ for details for the FT-K□/WKV8.

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Pliable fibers (flexible and sharp bending fibers) are marked with light blue in the table.

	FX-301 / FX-301-HS / FX-311 (Only LONG/STD/S-D for FX-311)	FX-305	FX-411 / FX-412	Beam axis dia. (mm in)	Fiber cable length ✂️ : Free cut	Bending radius	Ambient temperature
	General purpose / High-speed / Sensitivity types	FX-301's 2 output type	Digital dual display + Adjuster operation				
	200 7.874 100 3.937 70 2.756 40 1.575 (FX-301-HS: —) 40 1.575	300 11.811 200 7.874 140 5.512 100 3.937 70 2.756 40 1.575	400 15.748 100 3.937 70 2.756	ø1.5 ø0.059	1 m 3.281 ft		
	150 5.906 75 2.953 50 1.969 30 1.181 (FX-301-HS: —) 30 1.181	220 8.661 150 5.906 105 4.134 75 2.953 50 1.969 30 1.181	280 11.024 70 2.756 49 1.929	ø0.5 ø0.020			
	440 17.323 220 8.661 150 5.906 80 3.150 (FX-301-HS: —) 80 3.150	660 25.984 440 17.323 308 12.126 220 8.661 150 5.906 80 3.150	880 34.646 220 8.661 150 5.906	ø1.5 ø0.059	2 m 6.562 ft	R1 mm R0.039 in	-40 to +60 °C -40 to +140 °F
	580 22.835 290 11.417 210 8.268 110 4.331 (FX-301-HS: —) 110 4.331	870 34.252 580 22.835 406 15.984 290 11.417 210 8.268 110 4.331	1,000 39.370 250 9.843 175 6.890	ø1 ø0.039			
	2,000 78.740 1,000 39.370 800 31.496 300 11.811 (FX-301-HS: 150 5.906) 350 13.780	3,000 118.110 2,000 78.740 1,500 59.055 1,000 39.370 800 31.496 300 11.811	(Note 3) 3,500 137.795 1,000 39.370 800 31.496	ø2.2 ø0.087		R25 mm R0.984 in	
	1,700 66.929 700 27.559 600 23.622 280 11.024 (FX-301-HS: 140 5.512) 300 11.811	2,200 86.614 1,700 66.929 1,000 39.370 700 27.559 600 23.622 280 11.024	(Note 3) 3,500 137.795 700 27.559 600 23.622	ø2.5 ø0.098	2 m 6.562 ft	R1 mm R0.039 in	-40 to +55 °C -40 to +131 °F
	2,000 78.740 1,000 39.370 800 31.496 300 11.811 (FX-301-HS: 150 5.906) 350 13.780	3,000 118.110 2,000 78.740 1,500 59.055 1,000 39.370 800 31.496 300 11.811	(Note 3) 3,500 137.795 1,000 39.370 700 27.559	ø2.5 ø0.098	2 m 6.562 ft	R25 mm R0.984 in	-40 to +60 °C
	500 19.685 250 9.843 180 7.087 90 3.543 (FX-301-HS: 45 1.772) 100 3.937	600 23.622 500 19.685 300 11.811 250 9.843 180 7.087 90 3.543	500 19.685 135 5.315 100 3.937	ø1 ø0.039		R10 mm R0.394 in	-40 to +140 °F

● Each amplifier response time (Red LED type)	HYPR	U-LG	LONG	STDF	STD	FAST	H-SP	S-D
FX-500 series	24 ms	4 ms	2 ms	—	250 µs	60 µs	25 µs	—
FX-101 / FX-102 (Note)	—	—	—	—	250 µs / 2.5 ms	—	—	—
FX-301 / FX-301-HS	—	—	2 ms	—	250 µs	150 µs	65 µs / 35 µs	250 µs
FX-305	—	4.5 ms	2.5 ms	700 µs	250 µs	150 µs	65 µs	—
FX-411 / FX-412	—	4.5 ms	—	—	500 µs	150 µs	—	—
FX-311	—	—	2 ms	—	250 µs	—	—	250 µs

Note: For the FX-100 series response times, FX-101's response frequency is 0, and FX-102's response frequency is 1.

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### Red LED type sensing range

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

Type	Shape of fiber head (mm in)	Model No.	Sensing range (mm in) (Note 1)		
			■ : HYPR ■ : U-LG ■ : LONG ■ : STDF ■ : STD ■ : FAST ■ : H-SP ■ : S-D		
			FX-500 series	FX-101 (Upper value) FX-102 (Lower value)	
		Dual display digital standard type	Dual display digital		
Wide beam	Wide area sensing  Sensing width 32 mm 1.260 in W5 × H69 × D20 W0.197 × H2.717 × D0.787	FT-WA30	(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) 3,300 129.921	(Note 2) 3,500 137.795 (Note 2) 3,500 137.795	
		FT-A30			
	Wide area sensing  Sensing width 11 mm 0.433 in W4.2 × H31 × D13.5 W0.165 × H1.220 × D0.531	FT-WA8	(Note 2) 3,600 141.732 (Note 2) 3,600 141.732 (Note 2) 3,600 141.732 (Note 2) 3,300 129.921 980 38.583	1,500 59.055 (Note 2) 3,500 137.795	
		FT-A8			
Special Array	Top sensing W5 × H15 × D15 W0.197 × H0.591 × D0.591 	FT-AFM2	3,500 137.795 2,000 78.740 1,500 59.055 860 33.858 490 19.291 160 6.299	280 11.024 720 28.346	
	Side sensing W5 × H15 × D15 W0.197 × H0.591 × D0.591 	FT-AFM2E		240 9.449 670 26.378	
Heat-resistant	350 °C 662 °F Lens (FX-LE1/LE2/SV1) mountable 	FT-H35-M2	1,200 47.244 880 34.646 670 26.378 430 16.929 250 9.843 80 3.150	170 6.693 490 19.291	
	350 °C 662 °F Sleeve 60 mm 2.362 in 	FT-H35-M2S6			
	Allows flexible wiring 200 °C 392 °F Lens (FX-LE1/LE2/SV1) mountable 	FT-H20W-M1	(Note 2) 1,600 62.992 1,000 39.370 840 33.071 470 18.504 300 11.811 90 3.543	100 3.937 300 11.811	
	200 °C 392 °F Lens (FX-LE1/LE2/SV1) mountable 	FT-H20-M1	(Note 2) 1,600 62.992 1,300 51.181 960 37.795 540 21.260 330 12.992 110 4.331	210 8.268 540 21.260	
	130 °C 266 °F Lens (FX-LE2 only) mountable 	FT-H13-FM2	3,300 129.921 1,900 74.803 1,300 51.181 700 27.559 410 16.142 140 5.512	250 9.843 700 27.559	

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 to 3,600 mm 141.732 in or 3,500 mm 137.795 in, 1,600 mm 62.992 in long.

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Pliable fibers (flexible and sharp bending fibers) are marked with light blue in the table.

	FX-301 / FX-301-HS / FX-311 (Only LONG/STD/S-D for FX-311)	FX-305	FX-411 / FX-412	Beam axis dia. (mm in)	Fiber cable length ✂ : Free cut	Bending radius	Ambient temperature	
	General purpose / High-speed / Sensitivity types	FX-301's 2 output type	Digital dual display + Adjuster operation					
	(Note 2) 3,500 137.795 (Note 2) 3,500 137.795 (Note 2) 3,500 137.795 3,000 118.110 (FX-301-HS: 1,800 70.866) (Note 2) 3,500 137.795	(Note 2) 3,500 137.795 (Note 2) 3,500 137.795 (Note 2) 3,500 137.795 (Note 2) 3,500 137.795 (Note 2) 3,500 137.795 3,000 118.110	(Note 2) 3,500 137.795 (Note 2) 3,500 137.795 (Note 2) 3,500 137.795 (Note 2) 3,500 137.795	3.2 × 32 0.126 × 1.260		R1 mm R0.039 in  R10 mm R0.394 in	-40 to +55 °C -40 to +131 °F  -40 to +60 °C -40 to +140 °F	
	(Note 2) 3,500 137.795 1,500 59.055 1,100 43.307 1,080 42.520 (FX-301-HS: 640 25.197) 750 29.528	(Note 2) 3,500 137.795 (Note 2) 3,500 137.795 3,300 129.921 1,500 59.055 1,100 43.307 1,080 42.520	(Note 2) 3,500 137.795 1,500 59.055 1,100 43.307	2.2 × 11 0.087 × 0.433	2 m 6.562 ft	R1 mm R0.039 in  R10 mm R0.394 in	-40 to +55 °C -40 to +131 °F  -40 to +70 °C -40 to +158 °F	
	650 25.591 330 12.992 220 8.661 100 3.937 (FX-301-HS: 60 2.362) 115 4.528	850 33.465 650 25.591 380 14.961 330 12.992 220 8.661 100 3.937	940 37.008 240 9.449 170 6.693	0.265 × 5.5 0.010 × 0.217		R25 mm R0.984 in	-40 to +70 °C -40 to +158 °F	
	590 23.228 290 11.417 200 7.874 90 3.543 (FX-301-HS: 54 2.126) 100 3.937	800 31.496 590 23.228 350 13.780 290 11.417 200 7.874 90 3.543	880 34.646 210 8.268 155 6.102					
	550 21.654 280 11.024 200 7.874 85 3.346 (FX-301-HS: 50 1.969) 90 3.543	750 29.528 550 21.654 330 12.992 280 11.024 200 7.874 85 3.346	600 23.622 150 5.906 110 4.331	ø1.2 ø0.047	2 m 6.562 ft	Fiber R25 mm R0.984 in Sleeve R10 mm R0.394 in	-60 to +350 °C -76 to +662 °F	
	310 12.205 140 5.512 100 3.937 40 1.575 (FX-301-HS: 20 0.787) 50 1.969	420 16.535 310 12.205 180 7.087 140 5.512 100 3.937 40 1.575	400 15.748 110 4.331 80 3.150	ø0.8 ø0.031		1 m 3.281 ft	R10 mm R0.394 in	-60 to +200 °C -76 to +392 °F
	550 21.654 280 11.024 200 7.874 85 3.346 (FX-301-HS: 50 1.969) 90 3.543	750 29.528 550 21.654 320 12.598 280 11.024 200 7.874 85 3.346	550 21.654 150 5.906 100 3.937	ø1.2 ø0.047		R25 mm R0.984 in	-60 to +130 °C -76 to +266 °F	
	880 34.646 440 17.323 300 11.811 150 5.906 (FX-301-HS: 90 3.543) 155 6.102	1,200 47.244 880 34.646 550 21.654 440 17.323 300 11.811 150 5.906	1,100 43.307 280 11.024 200 7.874	ø1.5 ø0.059	2 m 6.562 ft			

● Each amplifier response time (Red LED type)	HYPR	U-LG	LONG	STDF	STD	FAST	H-SP	S-D
<b>FX-500 series</b>	24 ms	4 ms	2 ms	—	250 μs	60 μs	25 μs	—
<b>FX-101 / FX-102 (Note)</b>	—	—	—	—	250 μs / 2.5 ms	—	—	—
<b>FX-301 / FX-301-HS</b>	—	—	2 ms	—	250 μs	150 μs	65 μs / 35 μs	250 μs
<b>FX-305</b>	—	4.5 ms	2.5 ms	700 μs	250 μs	150 μs	65 μs	—
<b>FX-411 / FX-412</b>	—	4.5 ms	—	—	500 μs	150 μs	—	—
<b>FX-311</b>	—	—	2 ms	—	250 μs	—	—	250 μs

Note: For the FX-100 series response times, FX-101's response frequency is 0, and FX-102's response frequency is 1.

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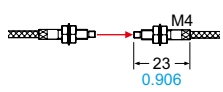
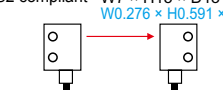
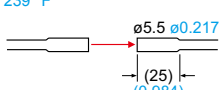
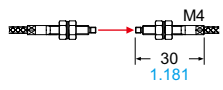
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Thru-beam type Threaded type	Thru-beam type Cylindrical type	Thru-beam type Rectangular type	Thru-beam type Narrow beam / Wide beam	Thru-beam type Array / Heat-resistant	Thru-beam type Chemical-resistant / Vacuum resistant	Retroreflective type	Reflective type Threaded type	Reflective type Cylindrical type	Reflective type Rectangular type	Reflective type Wide beam	Reflective type Liquid detection	Reflective type Heat-resistant / Vacuum resistant
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### Red LED type sensing range

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

Type	Shape of fiber head (mm in)	Model No.	Sensing range (mm in) (Note 1)			
			■ : HYPR ■ : U-LG ■ : LONG ■ : STDF ■ : STD ■ : FAST ■ : H-SP ■ : S-D			
			FX-500 series	FX-101 (Upper value)	FX-102 (Lower value)	
			Dual display digital standard type	Dual display digital		
Special	Lens (FX-LE1/LE2/SV1) mountable  	FT-H20-J20-S (Note 4)				
		FT-H20-J30-S (Note 4)	■ 1,600 62.992 ■ 1,000 39.370 ■ 790 31.102 ■ 470 18.504 ■ 300 11.811 ■ 90 3.543	■ 135 5.315	■ 420 16.535	
		FT-H20-J50-S (Note 4)				
	Side-view	FT-H20-VJ50-S (Note 4)	■ 2,100 82.677 ■ 1,300 51.181 ■ 980 38.583 ■ 600 23.622 ■ 390 15.354 ■ 120 4.724	■ 150 5.906	■ 500 19.685	
		FT-H20-VJ80-S (Note 4)				
		FT-Z802Y (Note 6)	(Note 5) ■ 3,600 141.732 (Note 5) ■ 3,600 141.732 (Note 5) ■ 3,600 141.732 ■ 3,100 122.047 ■ 1,900 74.803 ■ 470 18.504	■ 520 20.472	■ 3,100 122.047	
	Chemical-resistant	Easy mounting · Rectangular head SEMI S2 compliant W7 × H15 × D13 W0.276 × H0.591 × D0.512  	FT-HL80Y	(Note 5) ■ 3,600 141.732 (Note 5) ■ 3,600 141.732 (Note 5) ■ 3,600 141.732 (Note 5) ■ 3,600 141.732 ■ 2,300 90.551 ■ 740 29.134	■ 990 38.976	■ 2,340 92.126
		FT-L80Y	(Note 5) ■ 3,600 141.732 (Note 5) ■ 3,600 141.732 (Note 5) ■ 3,600 141.732 (Note 5) ■ 3,600 141.732 ■ 2,800 110.236 ■ 920 36.220	■ 1,100 43.307	■ 2,600 102.362	
		Side-view	FT-V80Y	(Note 5) ■ 3,600 141.732 ■ 2,800 110.236 ■ 2,200 86.614 ■ 1,300 51.181 ■ 800 31.496 ■ 240 9.449	■ 340 13.386	■ 800 31.496
		115 °C 239 °F  				
Vacuum-resistant	300 °C 572 °F Lens (FV-LE1/SV2) mountable  	FT-H30-M1V-S (Note 8)	■ 1,000 39.370 ■ 590 23.228 ■ 470 18.504 ■ 270 10.630 ■ 160 6.299 ■ 55 2.165	■ 110 4.331	■ 280 11.024	

- 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) This is the fiber length (fixed length) for heat-resistant fibers. The ordinary-temperature fibers are free-cut to 2 m 6.562 ft.  
 3) The bending radius for the ordinary-temperature fiber is R25 mm R0.984 in or more.  
 4) Heat-resistant joint fibers and ordinary-temperature fibers (FT-FM2) are sold as a set. Please refer to p.27~ for details.  
 5) The fiber cable length practically limits the sensing range to 3,600 mm 141.732 in or 3,500 mm 137.795 in long.  
 6) Refer to p.22~ for details for the FT-Z802Y.  
 7) The allowable cutting range is 500 mm 19.685 in from the end that the amplifier inserted.  
 8) Sold as a set comprising vacuum type fiber + photo-terminal (FV-BR1) + fiber at atmospheric side (FT-J8). Please refer to p.25~ for details.

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INDUCTIVE PROXIMITY SENSORS
PARTICULAR USE SENSORS
SENSOR OPTIONS
SIMPLE WIRE-SAVING UNITS
WIRE-SAVING SYSTEMS
MEASUREMENT SENSORS
STATIC CONTROL DEVICES
ENDOSCOPE
LASER MARKERS
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HUMAN MACHINE INTERFACES
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Selection Guide
Fibers
Amplifiers
FT/FD/FR

Pliable fibers (flexible and sharp bending fibers) are marked with light blue in the table.

	FX-301 / FX-301-HS / FX-311 (Only LONG/STD/S-D for FX-311)	FX-305	FX-411 / FX-412	Beam axis dia. (mm in)	Fiber cable length ✂ : Free cut	Bending radius	Ambient temperature
	General purpose / High-speed / Sensitivity types	FX-301's 2 output type	Digital dual display + Adjuster operation				
	390 15.354 200 7.874 140 5.512 60 2.362 (FX-301-HS: Cannot use) 60 2.362	530 20.866 390 15.354 225 8.858 200 7.874 140 5.512 60 2.362	700 27.559 160 6.299 110 4.331	ø1.2 ø0.047	200 mm 7.874 in (Note 2)  300 mm 11.811 in (Note 2)  500 mm 19.685 in (Note 2)  800 mm 31.496 in (Note 2)	Heat-resistant fiber R18 mm R0.709 in (Note 3)	-60 to +200 °C -76 to +392 °F
	550 21.654 280 11.024 200 7.874 90 3.543 (FX-301-HS: Cannot use) 90 3.543	840 33.071 550 21.654 370 14.567 280 11.024 200 7.874 90 3.543	1,100 43.307 240 9.449 170 6.693				
	(Note 5) 3,500 137.795 1,500 59.055 1,000 39.370 500 19.685 (FX-301-HS: 300 11.811) 530 20.866	(Note 5) 3,500 137.795 (Note 5) 3,500 137.795 3,000 118.110 1,500 59.055 1,000 39.370 500 19.685	(Note 5) 3,500 137.795 750 29.528 540 21.260	ø3.7 ø0.146	2 m 6.562 ft (Note 7)	R25 mm R0.984 in	0 to +60 °C 32 to +140 °F
	(Note 5) 3,500 137.795 1,350 53.150 900 35.433 450 17.717 (FX-301-HS: —) 480 18.898	(Note 5) 3,500 137.795 (Note 5) 3,500 137.795 1,800 70.866 1,350 53.150 900 35.433 450 17.717	(Note 5) 3,500 137.795 800 31.496 550 21.654				
	(Note 5) 3,500 137.795 1,500 59.055 1,000 39.370 500 19.685 (FX-301-HS: 300 11.811) 530 20.866	(Note 5) 3,500 137.795 (Note 5) 3,500 137.795 2,000 78.740 1,500 59.055 1,000 39.370 500 19.685	(Note 5) 3,500 137.795 900 35.433 600 23.622				
	800 31.496 400 15.748 280 11.024 120 4.724 (FX-301-HS: 70 2.756) 140 5.512	1,000 39.370 800 31.496 500 19.685 400 15.748 280 11.024 120 4.724	1,500 59.055 350 13.780 250 9.843	ø2.8 ø0.110			-40 to +70 °C -40 to +158 °F
	250 9.843 125 4.921 90 3.543 50 1.969 (FX-301-HS: 25 0.984) 40 1.575	350 13.780 250 9.843 150 5.906 125 4.921 90 3.543 50 1.969	390 15.354 100 3.937 70 2.756				

● Each amplifier response time (Red LED type)	HYPR	U-LG	LONG	STDF	STD	FAST	H-SP	S-D
<b>FX-500 series</b>	24 ms	4 ms	2 ms	—	250 μs	60 μs	25 μs	—
<b>FX-101 / FX-102 (Note)</b>	—	—	—	—	250 μs / 2.5 ms	—	—	—
<b>FX-301 / FX-301-HS</b>	—	—	2 ms	—	250 μs	150 μs	65 μs / 35 μs	250 μs
<b>FX-305</b>	—	4.5 ms	2.5 ms	700 μs	250 μs	150 μs	65 μs	—
<b>FX-411 / FX-412</b>	—	4.5 ms	—	—	500 μs	150 μs	—	—
<b>FX-311</b>	—	—	2 ms	—	250 μs	—	—	250 μs

Note: For the FX-100 series response times, FX-101's response frequency is 0, and FX-102's response frequency is 1.

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LASER SENSORS

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MICRO PHOTO-ELECTRIC SENSORS

AREA SENSORS

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