

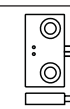





















Fiber Optic Cable

■ Specifications (Diffuse Reflective Type)

(based on Non-glossy white paper)

Type	Appearance	Feature	Model	Sensing distance (mm)	Min. sensing target ^{※3}	Allowable bend radius	Cable length (L) ^{※4}	Temp.
Flexible type ^{※5}		Flat type /Top view	FDFU-210-05R	35 ^{※1}	Ø0.0125	R1	1m Free cut	-40 to 60°C
		Flat type /Side view	FDFN-210-05R	30 ^{※1}				
		Flat type /Flat view	FDF-210-05R					
		M3 Bolt	FD-320-05R	35 ^{※1}	Ø0.0125			
		M4 Bolt	FD-420-05R	130 ^{※1}				
		M6 Bolt	FD-620-10R				Ø0.04	
Break-resistant type ^{※5}		M3 Bolt	FD-320-06B	35 ^{※2}	Ø0.0125	R5	2m Free cut	-40 to 70°C
		Ø3 Cylinder type	FDC-320-06B					
		M4 Bolt	FD-420-06B					
		M6 Bolt	FD-620-13B	100 ^{※2}				
Standard type		M3 Bolt	FD-320-05	40 ^{※2}	Ø0.03	R15	2m Free cut	-40 to 70°C
		M4 Bolt	FD-420-05					
		Ø3 Cylinder type	FDC-320-05					
		Ø3 Cylinder type SUS type (15mm)	FDCS-320-05					
		M3 Bolt SUS type (90mm)	FDS-320-05					
		M3 Bolt SUS type (45mm)	FDS2-320-05					
		M4 Bolt SUS type (90mm)	FDS-420-05					
		M4 Bolt SUS type (45mm)	FDS2-420-05					
		M6 Bolt	FD-620-10			120 ^{※2}		
	M6 Bolt SUS type (90mm)	FDS-620-10						
	M6 Bolt SUS type (45mm)	FDS2-620-10						
	Plastic	FDP-320-10		R30				

※1: The sensing distance is a standard for BF5 Series.

※2: The sensing distance is a standard for red LED of BF4 Series and 10% of red LED is applied when it is green LED.

It is applied to 40% of sensing distance for BF3RX.

※3: Min. sensing target is a value measured opaque material in accurate output status and the sensing distance is different with the rated sensing distance ※2.

※4: Fiber optic cable out of the rated length can be customizable.

※5: ● **Flexible optical fiber (Multi core)** : A large number of ultra-fine cores are all surrounded by cladding. Easy to install it in the many places as the change of the intensity of radiation by bending is small.

● **Break-resistant optical fiber** : The fiber units contain a large number of independent fine fibers, by ensuring a high degree of flexibility. It can be used for moving parts (robot hand) and it is not easily broken.

※ **Free cut** The sensing distance can be shortened about max. 20% than the normal according to condition of the cable. [(FC-3) should be used for cutting fiber cable.]

Fiber Optic Cable

■ Specifications (Diffuse Reflective Type)

(based on Non-glossy white paper)

Type	Appearance	Feature	Model	Sensing distance (mm)	Min. sensing target ^{※3}	Allowable bend radius	Cable length (L) ^{※4}	Temp.
Coaxial type		M3 Bolt	FD-320-F	40 ^{※2}	Ø0.03	R15	2m	-40 to 70°C
		M3 Bolt	FD-320-F1	60 ^{※2}				
		M6 Bolt	FD-620-F2	120 ^{※2}				
Heat-resistant type		M6 Bolt	FD-620-10H			R30	-40 to 105°C	
		M6 Bolt	FD-620-15H1	160 ^{※2}		-40 to 150°C		
		M4 Bolt Glass type	GD-420-20H2	100 ^{※2}		R50	2m	-40 to 250°C
		M6 Bolt Glass type	GD-620-20H2					
Right angle		M6 Bolt	FDR-610-10R	120 ^{※1}	Ø0.04	R1	1m Free cut	
Side view		Ø3 Cylinder type	FDCSN-320-05	30 ^{※1}	Ø0.0125	R15	2m	-40 to 60°C

■ Specifications (convergent reflective type)

(based on Non-glossy white paper)

Type	Appearance	Feature	Model	Sensing distance (mm)	Min. sensing target ^{※3}	Allowable bend radius	Cable length (L) ^{※4}	Temp.
Convergent reflective type		Convergent reflective type	FLF-320-10	8 ^{※1}	Ø0.0125	R25	2m	-40 to 60°C

※1: The sensing distance is a standard for BF5 Series.

※2: The sensing distance is a standard for red LED of BF4 Series and 10% of red LED is applied when it is green LED. It is applied to 40% of sensing distance for BF3RX.

※3: Min. sensing target is a value measured opaque material in accurate output status and the sensing distance is different with the rated sensing distance ※2.

※4: Fiber optic cable out of the rated length can be customizable.

※**Free cut**: The sensing distance can be shortened about max. 20% than the normal according to condition of the cable. [(FC-3) should be used for cutting fiber cable.]

※**Glass type** is for BF5R, BF4R Series.

(A) Photoelectric Sensors

(B) Fiber Optic Sensors

(C) Door/Area Sensors

(D) Proximity Sensors

(E) Pressure Sensors

(F) Rotary Encoders

(G) Connectors/ Sockets

(H) Temperature Controllers

(I) SSRs / Power Controllers

(J) Counters

(K) Timers

(L) Panel Meters

(M) Tacho / Speed / Pulse Meters

(N) Display Units

(O) Sensor Controllers

(P) Switching Mode Power Supplies

(Q) Stepper Motors & Drivers & Controllers

(R) Graphic/ Logic Panels

(S) Field Network Devices

(T) Software

Fiber Optic Cable

■ Specifications (Through-Beam Type)

(based on Non-glossy white paper)

Type	Appearance	Feature	Model	Sensing distance (mm)	Min. sensing target ^{※3}	Allowable bend radius	Cable length (L) ^{※4}	Temp.
Flexible type ^{※5}		Flat type /Top view	FTFU-210-05R	110 ^{※1}	Ø0.04	R1	1m Free cut	-40 to 60°C
		Flat type /Side view	FTFN-210-05R					
		Flat type /Flat view	FTF-210-05R	100 ^{※1}				
		Flat type /Top+Side view	FTFB-210-05R	110 ^{※1}				
		Integrated bracket (L type) /Top view	FTLU-310-10R	500 ^{※1}				
			FTLU1-310-10R					
			FTLU2-310-10R					
Break-resistant type ^{※5}		M3 Bolt	FT-320-05R	110 ^{※1}	Ø0.3	R5	2m Free cut	
		Ø2 Cylinder type	FTC-220-05R					
		M4 Bolt	FT-420-10R	500 ^{※1}	Ø0.5			
Break-resistant type ^{※5}		M3 Bolt	FT-320-06B	110 ^{※2}	Ø0.3	R5		
		Ø1.5 Cylinder type	FTC-1520-06B					
		M4 Bolt	FT-420-13B	400 ^{※2}	Ø0.6			

※1: The sensing distance is a standard for BF5 Series.

※2: The sensing distance is a standard for red LED of BF4 Series and 10% of red LED is applied when it is green LED. It is applied to 40% of sensing distance for BF3RX.

※3: Min. sensing target is a value measured opaque material in accurate output status and the sensing distance is different with the rated sensing distance ※2.

※4: Fiber optic cable out of the rated length can be customizable.

※5: ● **Flexible optical fiber (Multi core)** : A large number of ultra-fine cores are all surrounded by cladding. Easy to install it in the many places as the change of the intensity of radiation by bending is small.

● **Break-resistant type optical fiber** : The fiber units contain a large number of independent fine fibers, by ensuring a high degree of flexibility. It can be used for moving parts (robot hand) and it is not easily broken.

※ **Free cut** The sensing distance can be shortened about max. 20% than the normal according to condition of the cable. [(FC-3) should be used for cutting fiber cable.]

※FT-420-13 was discontinued. FT-420-13B is replacement.

Fiber Optic Cable

Specifications (Through-Beam Type)

(based on Non-glossy white paper)

Type	Appearance	Feature	Model	Sensing distance (mm)	Min. sensing target ^{※3}	Allowable bend radius	Cable length (L) ^{※4}	Temp.
Standard type		M3 Bolt	FT-320-05	150 ^{※2}	Ø0.5	R15	2m	-40 to 70°C
	Line-up 	Ø1.5 Cylinder type	FTC-1520-05					
		Ø2 Cylinder type	FTC-220-05					
		Ø2 Cylinder type SUS type (15mm)	FTCS-220-05					
		M3 Bolt SUS type (90mm)	FTS-320-05					
		M3 Bolt SUS type (35mm)	FTS1-320-05					
		M3 Bolt SUS type (45mm)	FTS2-320-05					
		M4 Bolt	FT-420-10	500 ^{※2}	Ø1	R30	Free cut	
		Ø3 Cylinder type	FTC-320-10					
		Plastic	FTP-320-10					
	M4 Bolt SUS type (90mm)	FTS-420-10						
	M4 Bolt SUS type (45mm)	FTS2-420-10						
Heat-resistant type		M4 Bolt	FT-420-10H	300 ^{※2}		R30		-40 to 105°C
		M4 Bolt	FT-420-15H1	500 ^{※2}		R50		-40 to 150°C
		M4 Bolt Glass type	GT-420-13H2	400 ^{※2}		R25	2m	-40 to 250°C
Right angle	Line-up 	M4 Bolt	FTR-410-10R	460 ^{※1}	Ø0.5	R1	1m Free cut	
Side view		Ø2.47 Cylinder type	FTCSN-2520-05	120 ^{※1}	Ø0.0125	R15	2m	-40 to 60°C

※1: The sensing distance is a standard for BF5 Series.

※2: The sensing distance is a standard for red LED of BF4 Series and 10% of red LED is applied when it is green LED. It is applied to 40% of sensing distance for BF3RX.

※3: Min. sensing target is a value measured opaque material in accurate output status and the sensing distance is different with the rated sensing distance ※2.

※4: Fiber optic cable out of the rated length can be customizable.

※**Free cut**: The sensing distance can be shortened about max. 20% than the normal according to condition of the cable. [(FC-3) should be used for cutting fiber cable.]

※**Glass type** is for BF5R, BF4R Series.

(A) Photoelectric Sensors

(B) Fiber Optic Sensors

(C) Door/Area Sensors

(D) Proximity Sensors

(E) Pressure Sensors

(F) Rotary Encoders

(G) Connectors/ Sockets

(H) Temperature Controllers

(I) SSRs / Power Controllers

(J) Counters

(K) Timers

(L) Panel Meters

(M) Tacho / Speed / Pulse Meters

(N) Display Units

(O) Sensor Controllers

(P) Switching Mode Power Supplies

(Q) Stepper Motors & Drivers & Controllers

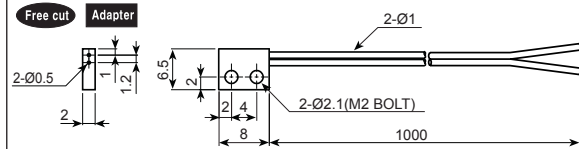
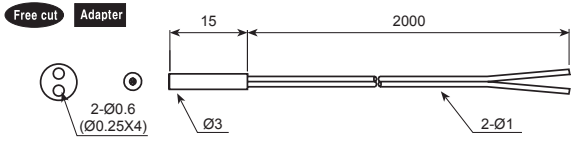
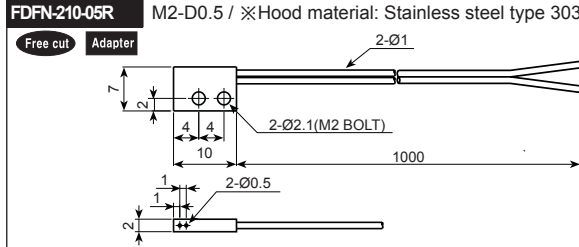
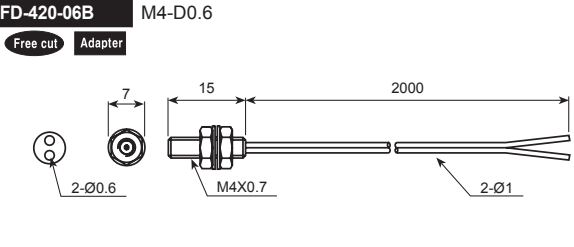
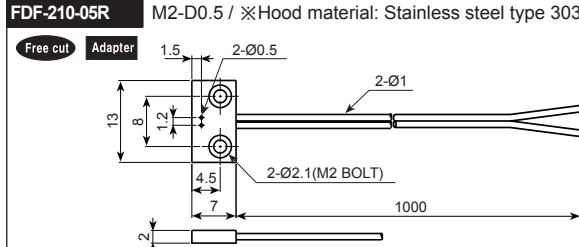
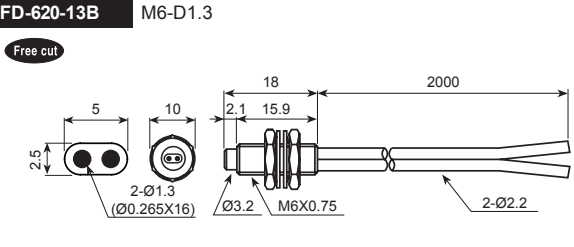
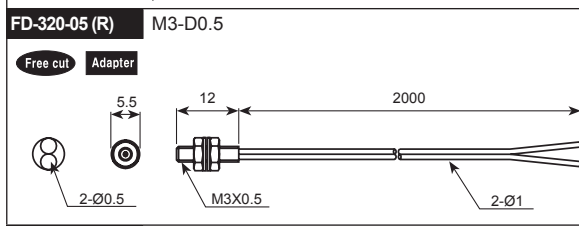
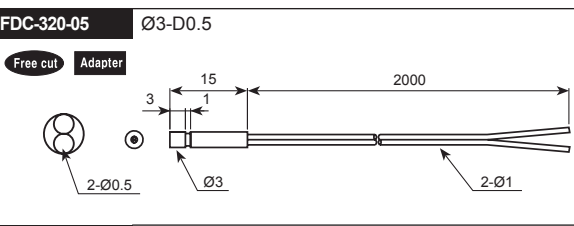
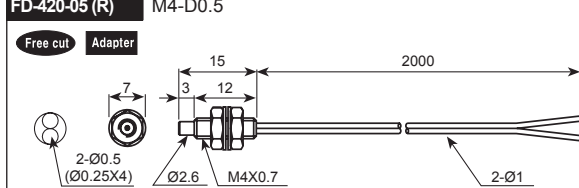
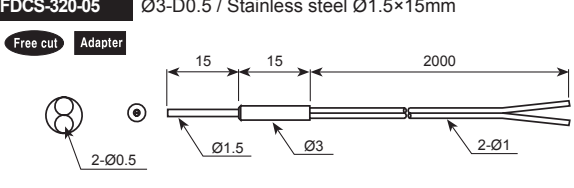
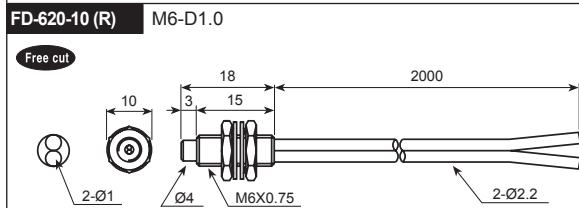
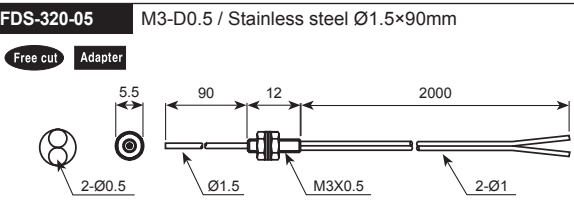
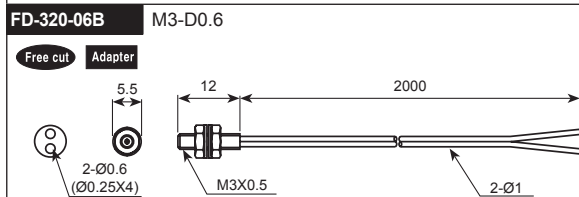
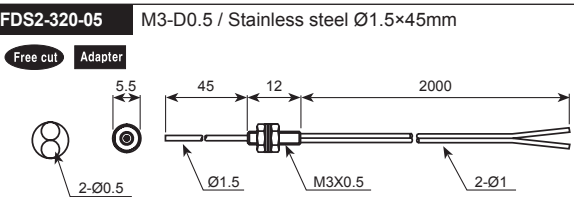
(R) Graphic/ Logic Panels

(S) Field Network Devices

(T) Software

Fiber Optic Cable

■ Dimensions

Model	Diffuse reflective type	Model	Diffuse reflective type
FD-FU-210-05R	M2-D0.5 / ※Hood material: Stainless steel type 303 	FDC-320-06B	M3-D0.6 
FD-FN-210-05R	M2-D0.5 / ※Hood material: Stainless steel type 303 	FD-420-06B	M4-D0.6 
FD-F-210-05R	M2-D0.5 / ※Hood material: Stainless steel type 303 	FD-620-13B	M6-D1.3 
FD-320-05 (R)	M3-D0.5 	FDC-320-05	Ø3-D0.5 
FD-420-05 (R)	M4-D0.5 	FDCS-320-05	Ø3-D0.5 / Stainless steel Ø1.5×15mm 
FD-620-10 (R)	M6-D1.0 	FDS-320-05	M3-D0.5 / Stainless steel Ø1.5×90mm 
FD-320-06B	M3-D0.6 	FDS2-320-05	M3-D0.5 / Stainless steel Ø1.5×45mm 

Fiber Optic Cable

Dimensions

Model	Diffuse reflective type	Model	Diffuse reflective type
FDS-420-05 Free cut Adapter	M4-D0.5 / Stainless steel $\varnothing 1.5 \times 90$ mm	FD-320-F1 Free cut Adapter	Co-axial M3 / $\varnothing 0.5$, $\varnothing 0.25 \times 9$
FDS2-420-05 Free cut Adapter	M4-D0.5 / Stainless steel $\varnothing 1.5 \times 45$ mm	FD-620-F2 Free cut	Co-axial M6 / $\varnothing 1.0$, $\varnothing 0.265 \times 16$
FDS-620-10 Free cut	M6-D1.0 / Stainless steel $\varnothing 2.5 \times 90$ mm	FD-620-10H Free cut	M6-D1.0 / Heat-resistant 105°C
FDS2-620-10 Free cut	M6-D1.0 / Stainless steel $\varnothing 2.5 \times 45$ mm	FD-620-15H1 Free cut	M6-D1.5 / Heat-resistant 150°C
FDP-320-10 Free cut	D1.0x2 / Plastic	GD-420-20H2	M4-D0.05x1000 / Heat-resistant 250°C
FD-320-F Free cut Adapter	Co-axial M3 / $\varnothing 0.5$, $\varnothing 0.25 \times 4$	GD-620-20H2	M6-D0.05x1000 / Heat-resistant 250°C
FDR-610-10R Free cut	M6-D1.0 / Hood material: Stainless steel type 303	FDCSN-320-05	Ø3 / Stainless steel $\varnothing 1.47 \times 20$ / Side view

(A) Photoelectric Sensors

(B) Fiber Optic Sensors

(C) Door/Area Sensors

(D) Proximity Sensors

(E) Pressure Sensors

(F) Rotary Encoders

(G) Connectors/ Sockets

(H) Temperature Controllers

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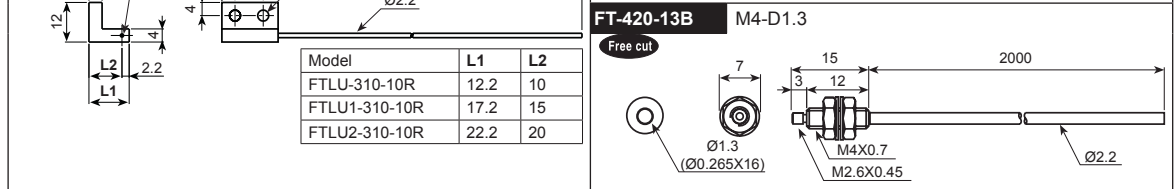
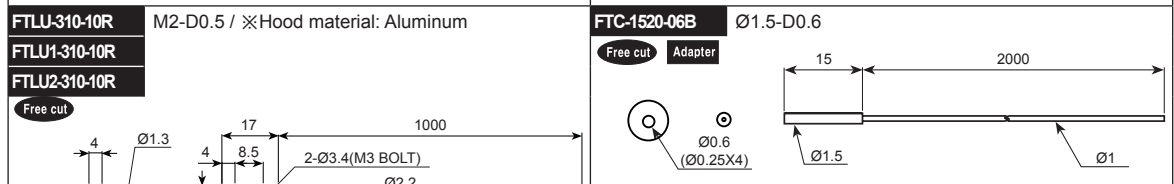
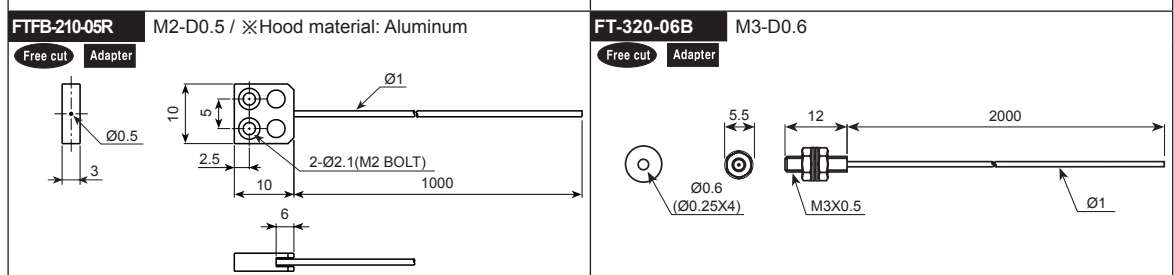
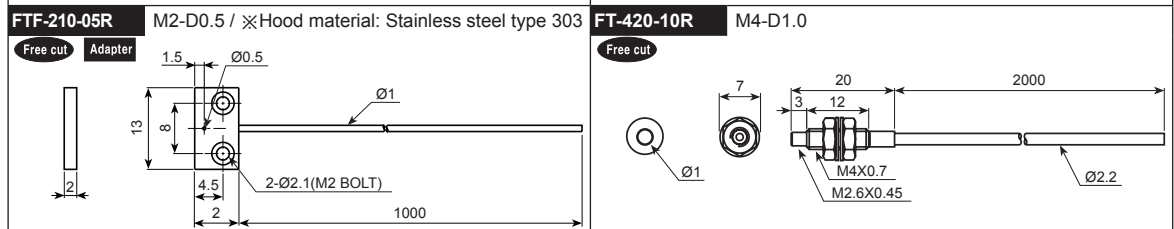
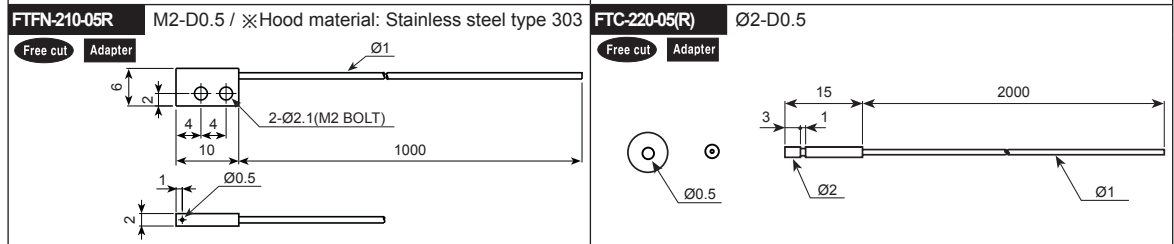
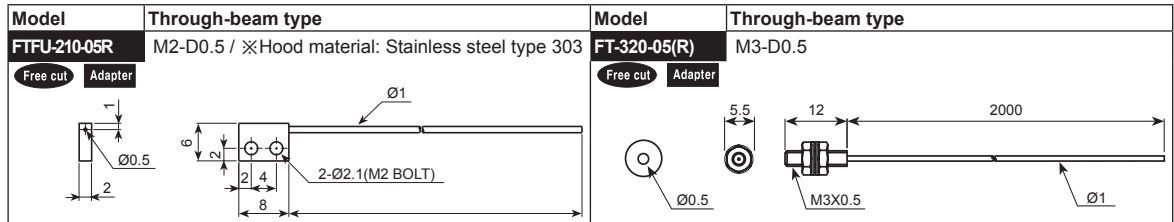
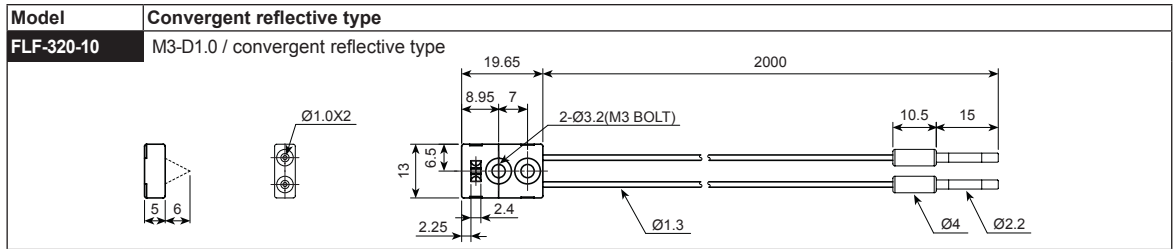
(R) Graphic/ Logic Panels

(S) Field Network Devices

(T) Software

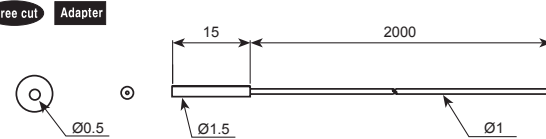
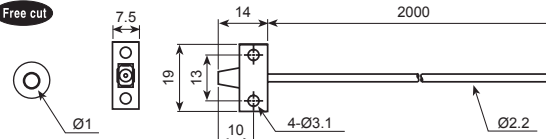
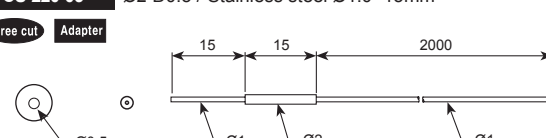
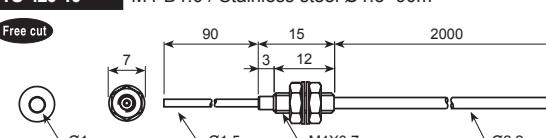
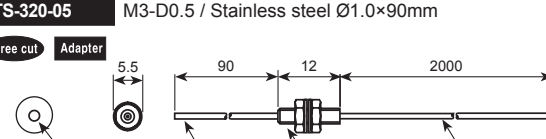
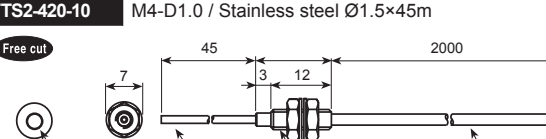
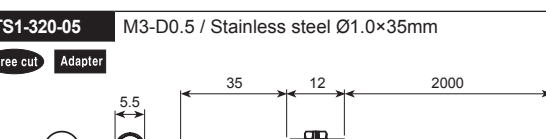
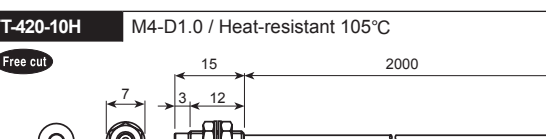
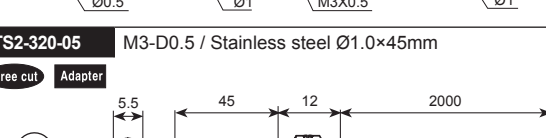
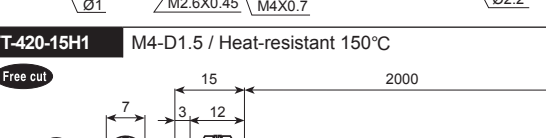

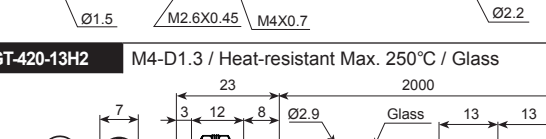

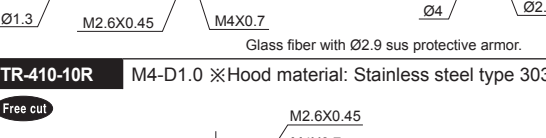
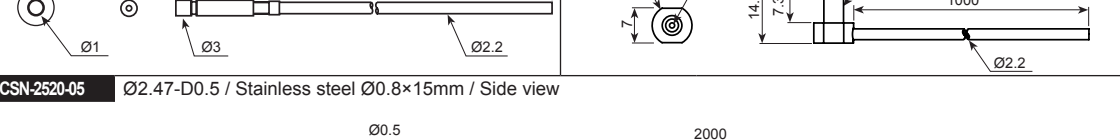
Fiber Optic Cable

■ Dimensions



Fiber Optic Cable

■ Dimensions

Model	Through-beam type	Model	Through-beam type
FTC-1520-05	Ø1.5-D0.5	FTP-320-10	D1.0 / Plastic
Free cut Adapter		Free cut	
FTCS-220-05	Ø2-D0.5 / Stainless steel Ø1.0×15mm	FTS-420-10	M4-D1.0 / Stainless steel Ø1.5×90m
Free cut Adapter		Free cut	
FTS-320-05	M3-D0.5 / Stainless steel Ø1.0×90mm	FTS2-420-10	M4-D1.0 / Stainless steel Ø1.5×45m
Free cut Adapter		Free cut	
FTS1-320-05	M3-D0.5 / Stainless steel Ø1.0×35mm	FT-420-10H	M4-D1.0 / Heat-resistant 105°C
Free cut Adapter		Free cut	
FTS2-320-05	M3-D0.5 / Stainless steel Ø1.0×45mm	FT-420-15H1	M4-D1.5 / Heat-resistant 150°C
Free cut Adapter		Free cut	
FT-420-10	M4-D1.0	GT-420-13H2	M4-D1.3 / Heat-resistant Max. 250°C / Glass
Free cut		Free cut	
FTC-320-10	Ø3-D1.0	FTR-410-10R	M4-D1.0 ※Hood material: Stainless steel type 303
Free cut		Free cut	
FTCSN-2520-05	Ø2.47-D0.5 / Stainless steel Ø0.8×15mm / Side view		
			

- (A) Photoelectric Sensors
- (B) Fiber Optic Sensors
- (C) Door/Area Sensors
- (D) Proximity Sensors
- (E) Pressure Sensors
- (F) Rotary Encoders
- (G) Connectors/ Sockets
- (H) Temperature Controllers
- (I) SSRs / Power Controllers
- (J) Counters
- (K) Timers
- (L) Panel Meters
- (M) Tacho / Speed / Pulse Meters
- (N) Display Units
- (O) Sensor Controllers
- (P) Switching Mode Power Supplies
- (Q) Stepper Motors & Drivers & Controllers
- (R) Graphic/ Logic Panels
- (S) Field Network Devices
- (T) Software

Fiber Optic Cable

■ Lens Unit For Long Distance Detection (sold separately)

◎ Model : FTL-M26



◎ Mounting of lens

Mount the lens unit on the 3mm projecting point of the front hood.

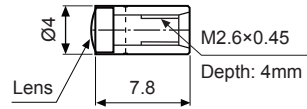
◎ Ambient temperature range of lens unit

It should be used within -40 to 100°C. (not over 100°C.)

◎ Applicable fiber optic cable and max. mounting distance

- FT-420-10 : 2500mm
- FT-420-10H : 1500mm

◎ Dimensions

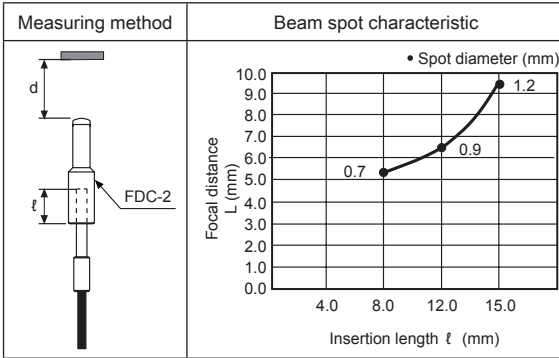


■ Micro Spot Fiber Optic Cable And Lens Unit (Sold Separately)

◎ Model

- Fiber optic cable: FDC-320-F
- Micro spot lens: FDC-2

◎ Feature data



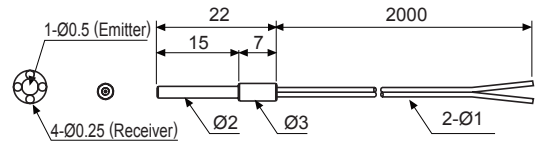
◎ Ambient temperature range of lens unit

It should be used within -40 to 100°C. (not over 100°C.)

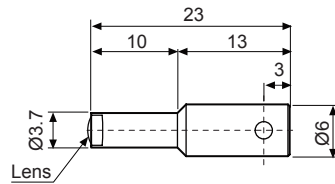
◎ Dimensions

(unit:mm)

• FDC-320-F



• FDC-2



■ Protection Tube For Fiber Optic Cable (Sold Separately)

◎ Application

: Protect cable from impact or cutting (unit:mm)

Model	Appearance and Dimension	L
FTH-305		500
FTH-310		1000
FTH-405		500
FTH-410		1000
FDH-605		500
FDH-610		1000

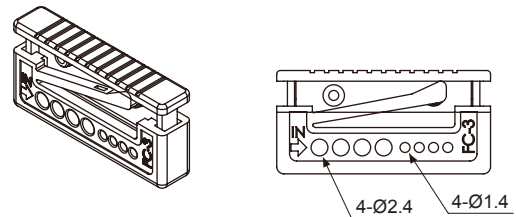
※Additional 8mm is for tube coupling.

■ Accessory

◎ Fiber cutter

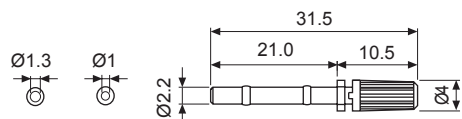
Applications: Cutting fiber optic cable, free cut type

• FC-3



◎ Adapter

Adapter: Adapter marked fiber optic cable should be used with adapter (unit: mm)



※The inside diameter Ø1 (Standard and black)

※The inside diameter Ø1.3 (Only applied to the receiver of FD-320-F1 and dark gray.)