Fiber optic sensor

■ Ordering information(Fiber optic amplifier)

BF 5 R - D 1 - N

N	NPN open collector output
P	PNP open collector output
1	Standard type
D	Dual display type
S	Single display type
R	Red LED
G	Green LED
B	Blue LED
5	Series
BF	Fiber Sensor

BF 4 R P - E

No mark	Standard type
E	External synchronization input type
R	Remote sensitivity setting type
No mark	NPN open collector output
P	PNP open collector output
R	Red LED
G	Green LED
4	Series
BF	Fiber Sensor

BF 3 RX - P

No mark	NPN open collector output
P	PNP open collector output
RX	Red LED
3	Series
BF	Fiber Sensor

■ Ordering information(Fiber optic cable)

F T □ - 4 20 - 10 □ S

Option

S	Small hood

Cable type

No mark	Standard type(-40 to 70℃)
H	Heat-resistance(-40 to 105℃)
H1	Heat-resistance(-40 to 150℃)
H2	Heat-resistance(-40 to 250℃)
R	Flexible type(R1)
B	Break-resistant type(R5)

Fiber diameter

05	ø0.5mm
06	ø0.6mm
10	ø1.0mm
13	ø1.3mm
14	ø1.4mm
15	ø1.5mm
20	ø2.0mm
F	ø0.5mm, ø0.25mm×4(coaxial type)
F1	ø0.5mm, ø0.25mm×9(coaxial type)
F2	ø1.0mm, ø0.265mm× 16(coaxial type)

Cable length

05	0.5m
10	1m
20	2m
10M	10m

Hood diameter (nut)

15	ø1.5mm
2	ø2mm(M2)
3	ø3mm(M3)
4	ø4mm(M4)
6	ø6mm(M6)

Head form

No mark	Standard type(bolt type)
P	Plastic type
S	SUS type(SUS length 90mm)
S1	SUS type(SUS length 35mm)
S2	SUS type(SUS length 45mm)
C	Cylinder type
CS	Cylinder+SUS type(SUS length 15mm)
H	Fire cable protection tube
LU	L type/Top view(Height 12.2mm)
LU1	L type/Top view(Height 17.2mm)
LU2	L type/Top view(Height 22.2mm)
F	Flat type/Flat view
FN	Flat type/Side view
FU	Flat type/Top view(Up)
FB	Flat type/Side view+Top view(Bending)

Sensing type

T	Through-beam type
D	Diffuse reflective type
L	Convergent reflective type

Fiber material

F	Plastic Fiber cable
G	Glass Fiber cable

※Please refer to the 39 to 47 page(Fiber optic cable specification) for exact model name of fiber optic cable, or it might cause wrong model selection not existing in the above ordering information.

Dual digital display type fiber optic amplifiers [BF5 Series]

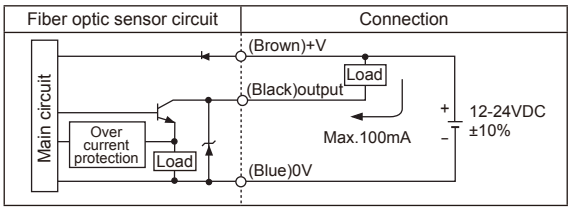
■ Specifications

Display type		Dual Display type			Single Display type
Model	NPN open collector output	**BF5R-D1-N**	**BF5G-D1-N**	**BF5B-D1-N**	**BF5R-S1-N**
	PNP open collector output	**BF5R-D1-P**	**BF5G-D1-P**	**BF5B-D1-P**	**BF5R-S1-P**
Appearances		Line-up **PNP output model** CE			
Light source		Red LED (660nm, modulated)	Green LED (530nm, modulated)	Blue LED (470nm, modulated)	Red LED (660nm, modulated)
Power supply		12-24VDC±10%			
Current consumption		Max. 50mA			
Operation mode		Light ON / Dark ON Selectable			
Control output		NPN or PNP open collector • Load voltage: Max. 24VDC • Load current: Max. 100mA • Residual voltage - NPN:Max. 1V, PNP:Max. 3V			
Protection circuit		Reverse polarity protection, overcurrent protection, surge absorption			
Response time		Ultra Fast: 50µs(only for dual display type), Fast: 150µs,STD: 500µs, Long: 4ms			
Display method		• Incident light level: Red, 4digit, 7Segment • SV: Green, 4digit, 7Segment • Main output indicator: Red LED			• Incident light level / SV: Red, 4digit, 7Segment • Main output indicator: Red LED
Display function		Incident light level / SV display [4,000/10,000 resolution], Percentage display, High/Low peak value display, Normal / Reversed display (only for dual display type)			
Sensitivity setting		Manual sensitivity setting, teaching sensitivity setting (Auto tuning, 1 point, 2 point teaching, positioning teaching)			Manual sensitivity setting, teaching sensitivity setting (auto tuning)
Mutual interference prevention		Max. 8 unit sets (Automatically set regardless of response time)			
Initializing		Initializing to factory mode			—
Energy saving		Normal / Energy saving 1 / Energy saving 2			—
Timer		OFF, OFF Delay, ON Delay, One-shot			OFF, 10ms OFF Delay timer, 40ms OFF Delay timer
Insulation resistance		Min. 20MΩ(at 500VDC megger)			
Dielectric strength		1,000VAC 50/60Hz for 1 min.			
Vibration		1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each X, Y, Z directions for 2 hours			
Shock		500m/s^2 (approx. 50G) in each X, Y, Z directions for 3 times			
Environ-ment	Ambient illumination	Incandescent lamp: Max. 3000lx Sunlight: Max. 11000lx (received illumination)			
	Ambient temperature	-10 to 50°C, storage: -20 to 70°C			
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH			
Protection		IP40(IEC standards)			
Material		Case: PBT, Cover: PC			
Fiber cable tightening torque		Min. 2kgf			
Accessory		Connector type wire(Ø4mm, 3-wire, length: 2m) (AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator out diameter: Ø1.25mm), Side connector			
Approval		CE			
Unit weight		Approx. 20g			

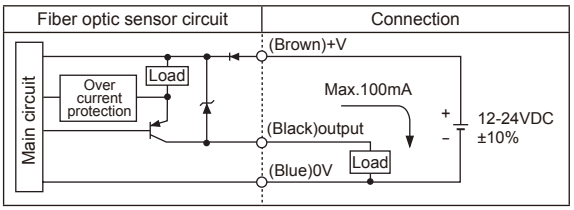
※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

■ Control output diagram

● NPN open collector output



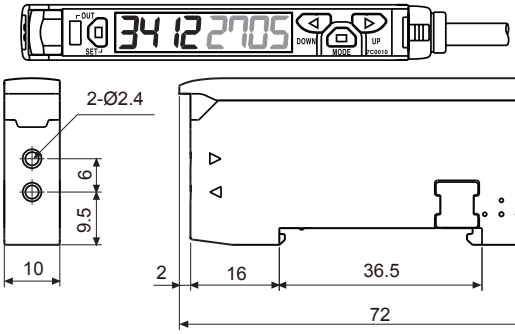
● PNP open collector output



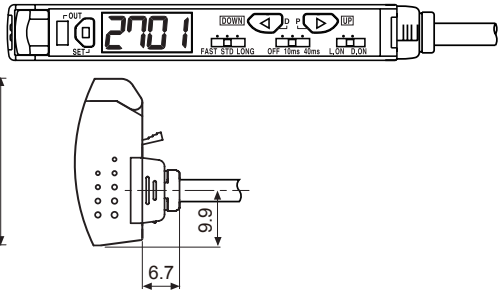
■ Dimensions

(unit: mm)

● **BF5□-D1-□**



● **BF5R-S1-□**



Digital fiber optic amplifier communication converter [BFC Series]

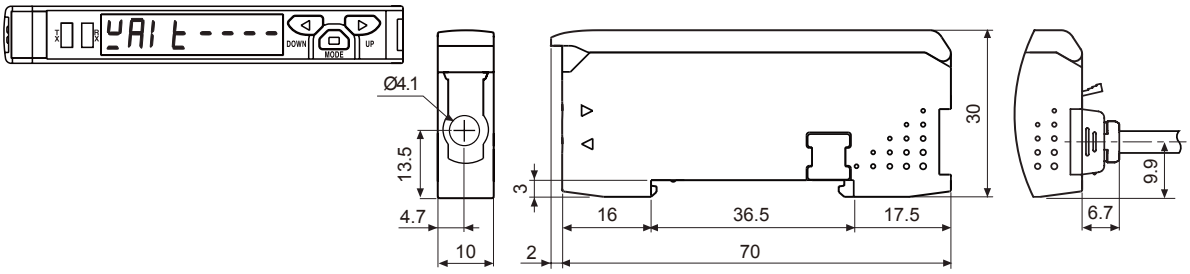
■ Specifications

Model		NPN Solid-state input	PNP Solid-state input
		BFC-N	BFC-P
Appearances		CE	
Power supply※1		12-24VDC ±10%	
Current consumption		Max. 40mA	
SW input (SW1, SW2)		LOW: 0-1V, HIGH: 5-24V	
		SW1/SW2 - HH: Standby, HL: BANK0, LH: BANK1, LL: BANK2	SW1/SW2 - LL: Standby, LH: BANK0, HL: BANK1, HH: BANK2
Communication function		RS485 communication, serial communication, SW input	
Communication speed		1200, 2400, 4800, 9600, 19200, 38400bps	
Indication		• Parameter: Red 4digit 7 Segment • Set value: Green 4digit 7 Segment • Indicator: TX indicator(red), RX indicator(green)	
Function		• Real-time monitoring (incident light level, on/off state) • Executes every BF5 feature and sets parameter by external device(PC, PLC)	
Environ-ment	Ambient temperature	-10 to 50℃, storage: -20 to 60℃	
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH	
Vibration		1.5 mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours	
Shock		500m/s²(approx. 50G) in each of X, Y, Z directions for 3 times	
Protection		IP40(IEC standard)	
Material		Case: PBT, Cover: PC	
Accessory		Connector type wire(ø4mm, 3-wire, length: 2m) (AWG 22, Core diameter: 0.08mm, Number of cores: 60, Insulator out diameter: ø1.25mm), Side connector	
Approval		CE	
Unit weight		Approx. 15g	

※1: Powered by supply voltage of the amplifier unit connected by a side connector.
※Environment resistance is rated at no freezing or condensation.

■ Dimensions

(unit: mm)



High reliability of fiber optic amplifier for convenient mounting [BF4 Series]

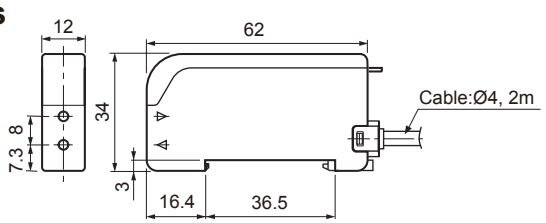
■ Specifications

Model	Standard type				External synchronization input type		Remote sensitivity setting type	
	BF4RP	**BF4GP**	**BF4R**	**BF4G**	**BF4R-E**	**BF4G-E**	**BF4R-R**	**BF4G-R**
Appearances	CE							
Response frequency	Max. 0.5ms(Frequency 1), Max. 0.7ms(Frequency 2)							
Power supply	12-24VDC ±10%(Ripple P-P: Max.10%)							
Current consumption	Max. 45mA							
Light source (modulated light)	Red	Green	Red	Green	Red	Green	Red	Green
Sensitivity adjustment	Sensitivity adjustment button(ON/OFF)							
Operation mode	Automatic selection of Light ON/Dark ON accordance with button setting							
Control output	NPN or PNP open collector output • Load voltage: Max. 30VDC • Load current: Max. 100mA • Residual voltage - NPN: Max. 1V(load current: 100mA), Max. 0.4V(load current:16mA) / PNP: Max. 2.5V							
Self-diagnosis output	ON state under unstable sensing(When the target stays for 300ms in unstable area), ON state when control output short-circuited							
	• Load voltage: Max. 30VDC • Load current: Max. 50mA • Residual voltage - NPN: Max. 1V(load current: 50mA), Max. 0.4V(load current:16mA) / PNP: Max. 2.5V							
Protection circuit	Reverse power polarity, short-circuit(overcurrent) protection circuit							
Indication	Operation indicator: Red LED, Stability indicator: Green LED ON when the target stays in stable sensing level							
Input of stop transmission function	—				Built-in		—	
External synchronization function	—				Built-in(Gate/Trigger)		—	
Remote sensitivity setting function	—				—		Built-in	
Interference prevention function※1	Built-in differential frequency mode (set by frequency 1 or 2 by ON/OFF button)							
Timer function (selectable)	Built-in OFF delay timer, Approx. 40ms fixed				—		Built-in OFF delay timer , Approx. 40ms fixed	
Ambient illumination	Sunlight: Max. 11,000lx, Incandescent lamp: Max. 3,000lx(Receiver illumination)							
Noise resistance	±240V the square wave noise(pulse width: 1μs) by the noise simulator							
Dielectric strength	1,000VAC 50/60Hz for 1 minute							
Insulation resistance	Min. 20MΩ(at 500VDC megger)							
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours							
Shock	500m/s²(approx. 50G) in each of X, Y, Z directions for 3 times							
Environ-ment: Ambient illumination	Sunlight: Max. 11000lx, Incandescent lamp: Max. 3000lx (received illumination)							
Environ-ment: Ambient temperature	-10 to 50℃, storage: -20 to 70℃							
Environ-ment: Ambient humidity	35 to 85% RH, storage :35 to 85% RH							
Material	Case: Heat-resistance ABS, Cover: PC							
Cable	Ø4mm, 4-wire, Length: 2m (AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator out diameter: Ø1.25mm)				Ø4mm, 6-wire, Length: 2m (AWG24, Core diameter: 0.08mm, Number of cores: 40, Insulator out diameter: Ø1mm)			
Accessory	Mounting bracket, Bolts/nuts							
Approval	CE							
Unit weight	Approx. 65g							

※1: Frequency 1(Normal mode): Max. 0.5ms, Frequency 2: Max. 0.7ms
※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

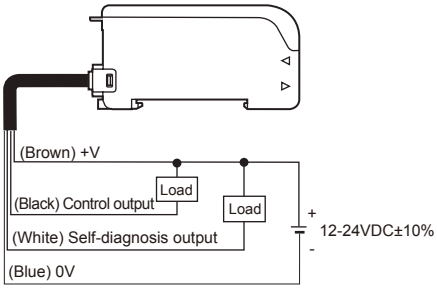
■ Dimensions

(unit: mm)

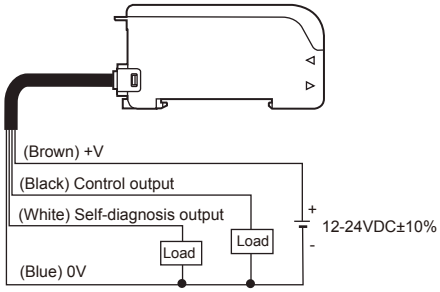


■ Connections

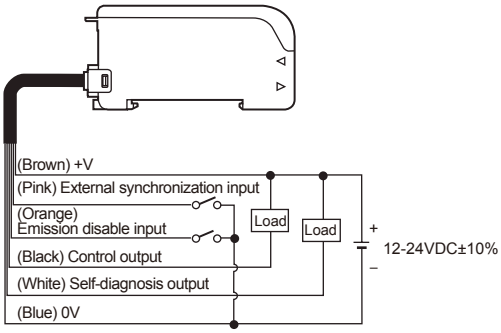
● **BF4R / BF4G**



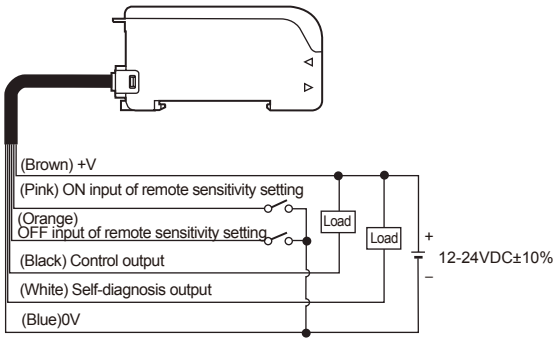
● **BF4RP / BF4GP**



● **BF4R-E / BF4G-E**



● **BF4R-R / BF4G-R**



High accuracy fiber optic amplifier with twin adjuster [BF3 Series]

■ Specifications

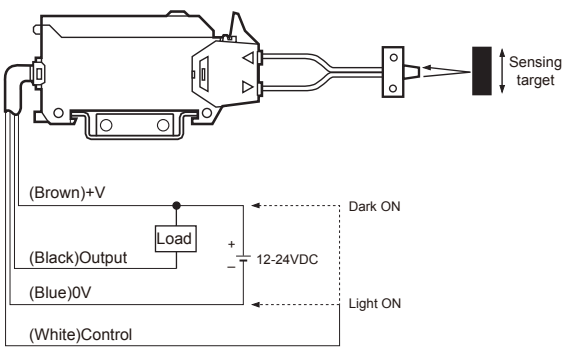
Model	**BF3RX**	**BF3RX-P**
Appearances	CE	
Response time	Max. 1ms	
Power supply	12-24VDC ±10%(Ripple P-P: Max. 10%)	
Current consumption	Max. 40mA	
Light source	Red LED(Modulated)	
Sensitivity adjustment	Adjustable VR(Dual adjustment: Coarse adjustment, Fine adjustment)	
Operation mode	Selectable Light ON or Dark ON by control cable	
Control output	NPN or PNP open collector output • Load voltage: Max. 30VDC • Load current: Max. 200mA, • Residual voltage - NPN: Max. 1V, PNP: Max. 2.5V	
Protection circuit	Reverse power polarity, output short-circuit protection circuit	
Indication	Operation indicator: Red LED	
Insulation resistance	Min. 20MΩ(at 500VDC megger)	
Noise resistance	±240V the square wave noise(pulse width: 1μs)by the noise simulator	
Dielectric strength	1,000VAC 50/60Hz for 1minute	
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours	

Model		BF3RX	BF3RX-P
Shock		500m/s² (approx. 50G) in each of X, Y, Z directions for 3 times	
Environ-ment	Ambient illumination	Sunlight: Max. 11,000lx, Incandescent lamp: Max. 3,000lx (Receiver illumination)	
	Ambient temperature	-10 to 50℃, storage: -25 to 70℃	
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH	
Material		Case: ABS, Cover: PC	
Cable		Ø5mm, 4-wire, Length: 2m (AWG24, Core diameter: 0.08mm, Number of cores: 40, Insulator out diameter: Ø1mm)	
Accessory		VR adjustment driver, Mounting bracket, Bolts/nuts	
Unit weight		Approx. 90g	

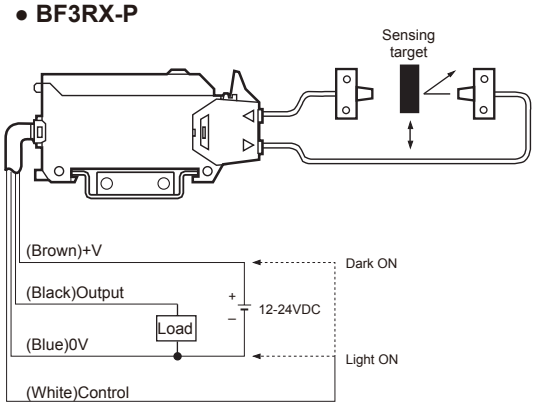
※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

■ Connections

● BF3RX



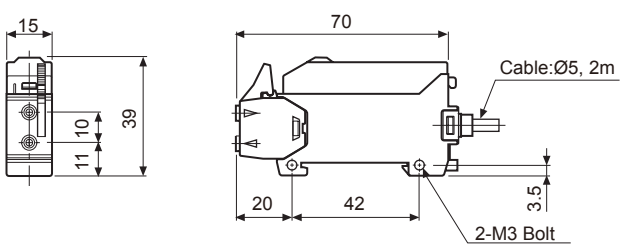
● BF3RX-P



※Enables to use as diffuse reflective type or through-beam type according to the fiber optic cable.
※Adapter marked fiber optic cable should be used with adapter( ).
※GT-420-13H2 cannot be used because the length inserted into amp is too short.

■ Dimensions

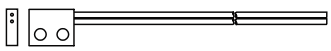
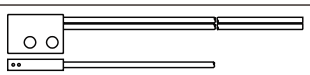
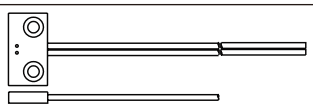
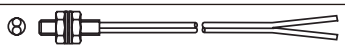
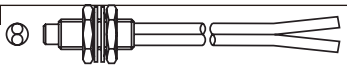
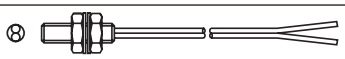
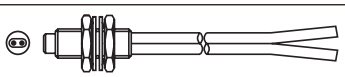
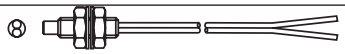
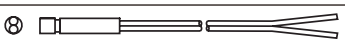
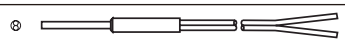
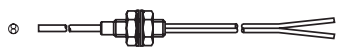
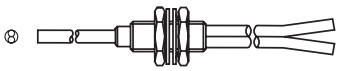
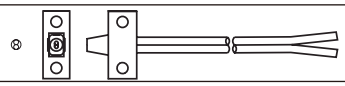
(unit: mm)



Fiber Optic Cable

■ Specifications (diffuse reflective type)

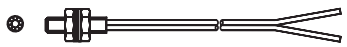
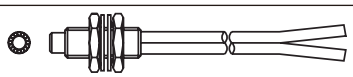
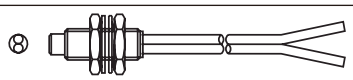
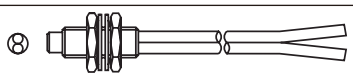
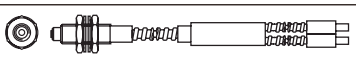
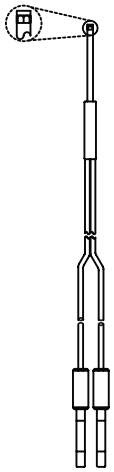
(based on Non-glossy white paper)

Type	Appearance	Feature	Model	Sensing distance (mm)	Min. sensing target※3	Allowable bend radius	Cable length(L)※4	Temp.
Flexible type※5	Line-up 	Flat type /Top view	**FDFU-210-05R**	35※1	Ø0.0125	R1	1m Free cut	-40 to 60°C
	Line-up 	Flat type /Side view	**FDFN-210-05R**	30※1				
	Line-up 	Flat type /Flat view	**FDF-210-05R**					
	Line-up 	M3 Bolt	**FD-320-05R**	35※1	Ø0.0125		2m Free cut	
	Line-up	M4 Bolt	**FD-420-05R**					
	Line-up 	M6 Bolt	**FD-620-10R**	130※1	Ø0.04			
Break-resistant type※5	Line-up	M3 Bolt	**FD-320-06B**	35※2	Ø0.0125	R5		
	Line-up	Ø3 Cylinder type	**FDC-320-06B**					
	Line-up 	M4 Bolt	**FD-420-06B**					
	Line-up 	M6 Bolt	**FD-620-13B**	100※2				
Standard type		M3 Bolt	**FD-320-05**	40※2	Ø0.03	R15		-40 to 70°C
		M4 Bolt	**FD-420-05**					
		Ø3 Cylinder type	**FDC-320-05**					
		Ø3 Cylinder type SUS type(90mm)	**FDCS-320-05**					
		M3 Bolt SUS type(90mm)	**FDS-320-05**			15R (SUS part 10R)		
		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		R30		
		M6 Bolt SUS type(90mm)	**FDS-620-10**			30R (SUS part 10R)		
		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 the many places where are bending areas because 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, 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-2) should be used for cutting fiber cable.]

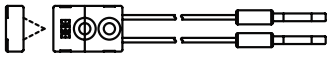
■ Specifications (diffuse reflective type)

(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 Free cut	-40 to 70℃
		M3 Bolt	**FD-320-F1**	60※2				
		M6 Bolt	**FD-620-F2**	120※2		R30		
Heat-resistant type		M6 Bolt	**FD-620-10H**			R30		-40 to 105℃
		M6 Bolt	**FD-620-15H1**	160※2		R50		-40 to 150℃
		M4 Bolt Glass type	**GD-420-20H2**	100※2			2m	-40 to 250℃
		M4 Bolt Glass type	**GD-620-20H2**					
Side view	Line-up 	Ø3 Cylinder type	**FDCSN-320-05**	30※1	Ø0.0125	R15	2m	-40 to 60℃

■ Specifications (convergent reflective type)

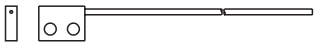
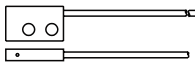
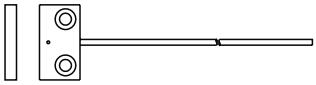
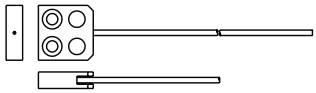
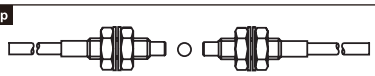
(based on Non-glossy white paper)

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

※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-2) should be used for cutting fiber cable.]
※Glass type is for BF5R, BF4R Series.

■ Specifications (through-beam type)

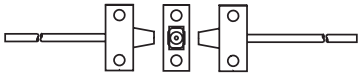
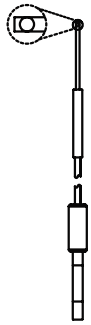
(based on Non-glossy white paper)

Type	Appearance	Feature	Model	Sensing distance (mm)	Min. sensing target※3	Allowable bend radius	Cable length(L)※4	Temp.
Flexible type※5	Line-up 	Flat type /Top view	**FTFU-210-05R**	110※1	Ø0.04	R1	1m Free cut	-40 to 60℃
	Line-up 	Flat type /Side view	**FTFN-210-05R**					
	Line-up 	Flat type /Flat view	**FTF-210-05R**	100※1				
	Line-up 	Flat type /Top+Side view	**FTFB-210-05R**	110※1				
	Line-up	Integrated bracket(L type) /Top view	**FTLU-310-10R**	500※1	Ø0.06			
			FTLU1-310-10R					
			FTLU2-310-10R					
	Line-up	M3 Bolt	**FT-320-05R**	110※1	Ø0.3		2m Free cut	
	Line-up	Ø2 Cylinder type	**FTC-220-05R**					
	Line-up 	M4 Bolt	**FT-420-10R**	500※1	Ø0.5			
Break-resistant type※5	Line-up	M3 Bolt	**FT-320-06B**	110※2	Ø0.3	R5		
	Line-up	Ø1.5 Cylinder type	**FTC-1520-06B**					
	Line-up	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 the many places where are bending areas because 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, 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-2) should be used for cutting fiber cable.]
※FT-420-13 was discontinued. FT-420-13B is replacement.

■ Specifications (through-beam type)

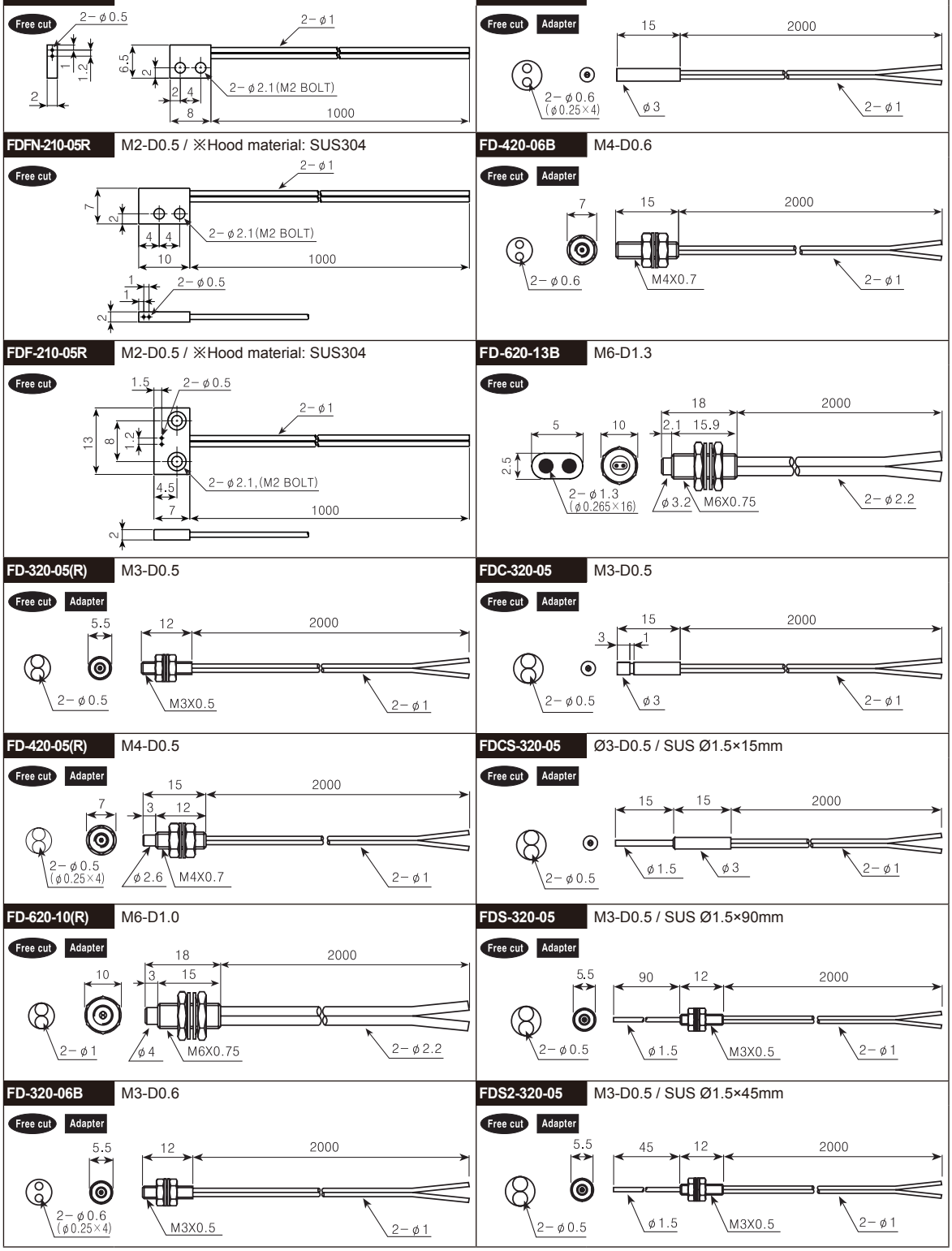
(based on Non-glossy white paper)

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 Free cut	-40 to 70℃
	Line-up	Ø1.5 Cylinder type	**FTC-1520-05**					
		Ø2 Cylinder type	**FTC-220-05**					
		Ø2 Cylinder type SUS type(90mm)	**FTCS-220-05**			R15 (SUS part 10R)		
		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		
		Ø3 Cylinder type	**FTC-320-10**					
		Plastic	**FTP-320-10**					
		M4 Bolt SUS type(90mm)	**FTS-420-10**			R30 (SUS part 10R)		
		M4 Bolt SUS type(45mm)	**FTS2-420-10**					
Heat-resistant type		M4 Bolt	**FT-420-10H**	300※2		R30		-40 to 105℃
		M4 Bolt	**FT-420-15H1**	500※2		R50		-40 to 150℃
		M4 Bolt Glass type	**GT-420-13H2**	400※2		R25	2m	-40 to 250℃
Side view	Line-up 	Ø2.47 Cylinder type	**FTCSN-2520-05**	120※1	Ø0.0125	R15	2m	-40 to 60℃

※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-2) should be used for cutting fiber cable.]
※Glass type is for BF5R, BF4R Series.

■ Dimensions

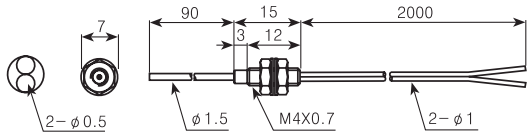
Model	Diffuse reflective type	Model	Diffuse reflective type
FDFU-210-05R	M2-D0.5 / ※Hood material: SUS304	FDC-320-06B	M3-D0.6
FDFN-210-05R	M2-D0.5 / ※Hood material: SUS304	FD-420-06B	M4-D0.6
FDF-210-05R	M2-D0.5 / ※Hood material: SUS304	FD-620-13B	M6-D1.3
FD-320-05(R)	M3-D0.5	FDC-320-05	M3-D0.5
FD-420-05(R)	M4-D0.5	FDCS-320-05	Ø3-D0.5 / SUS Ø1.5×15mm
FD-620-10(R)	M6-D1.0	FDS-320-05	M3-D0.5 / SUS Ø1.5×90mm
FD-320-06B	M3-D0.6	FDS2-320-05	M3-D0.5 / SUS Ø1.5×45mm



■ Dimensions

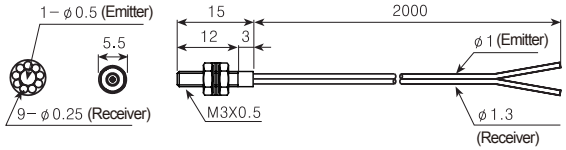
Model	Diffuse reflective type
FDS-420-05	M4-D0.5 / SUS Ø1.5×90mm

Free cut Adapter



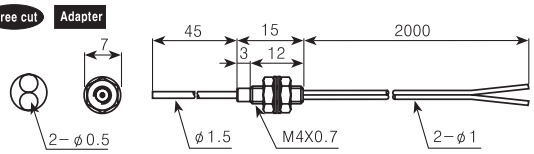
Model	Diffuse reflective type
FD-320-F1	Co-axial M3 / Ø0.5, Ø0.25×9

Free cut Adapter



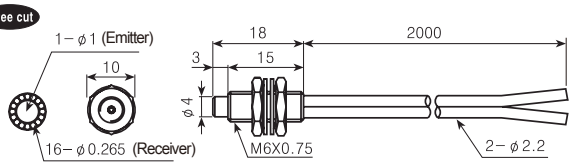
Model	Diffuse reflective type
FDS2-420-05	M4-D0.5 / SUS Ø1.5×45mm

Free cut Adapter



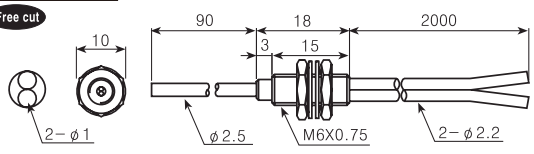
Model	Diffuse reflective type
FD-620-F2	Co-axial M6 / Ø1.0, Ø0.265×16

Free cut



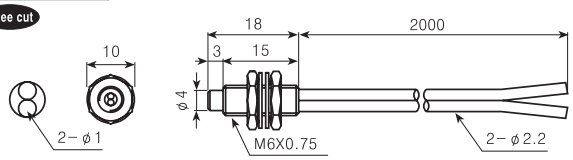
Model	Diffuse reflective type
FDS-620-10	M6-D1.0 / SUS Ø2.5×90mm

Free cut



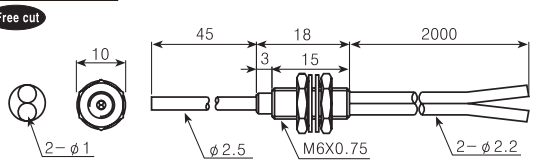
Model	Diffuse reflective type
FD-620-10H	M6-D1.0 / Heat-resistant 105℃

Free cut



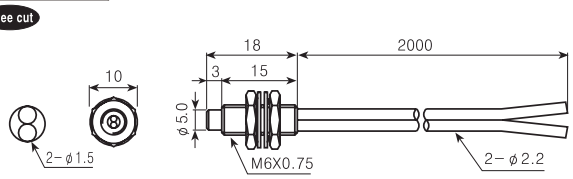
Model	Diffuse reflective type
FDS2-620-10	M6-D1.0 / SUS Ø2.5×45mm

Free cut



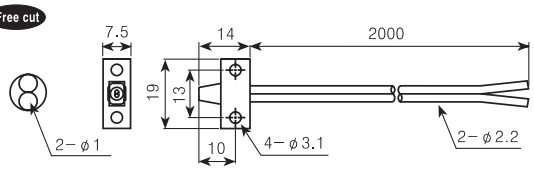
Model	Diffuse reflective type
FD-620-15H1	M6-D1.5 / Heat-resistant 150℃

Free cut

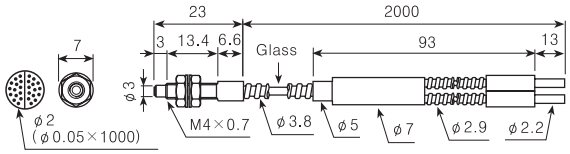


Model	Diffuse reflective type
FDP-320-10	D1.0×2 / Plastic

Free cut

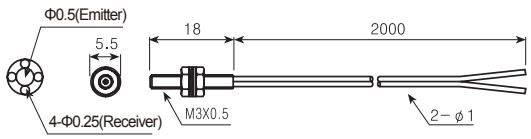


Model	Diffuse reflective type
GD-420-20H2	M4-D0.05×1000 / Heat-resistant 250℃

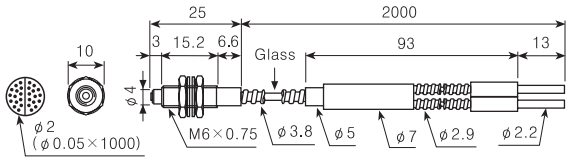


Model	Diffuse reflective type
FD-320-F	Co-axial M3 / Ø0.5, Ø0.25×4

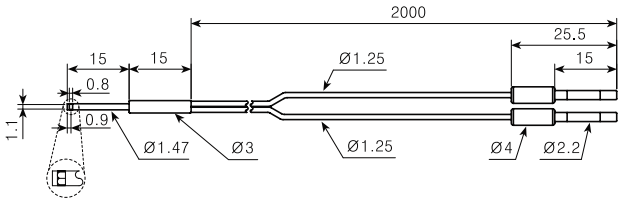
Free cut Adapter



Model	Diffuse reflective type
GD-620-20H2	M6-D0.05×1000 / Heat-resistant 250℃

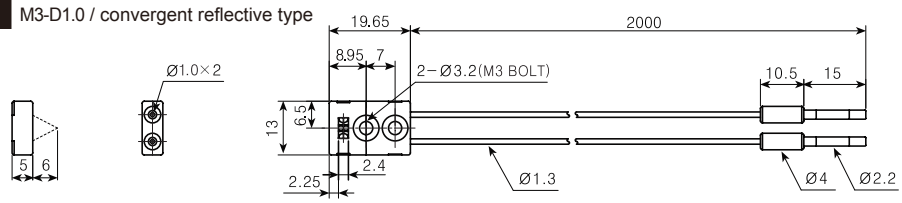


Model	Diffuse reflective type
FDCSN-320-05	Ø3 / SUS Ø1.47×20 / Side view

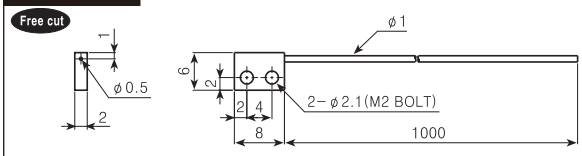


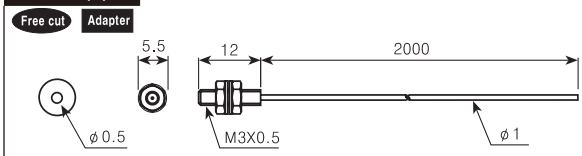
■ Dimensions

Model	Convergent reflective type
FLF-320-10	M3-D1.0 / convergent reflective type

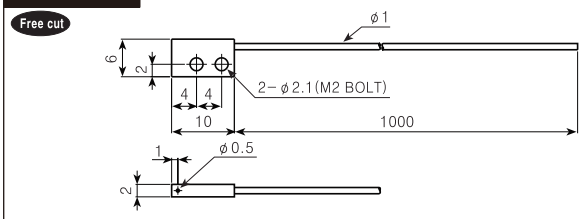


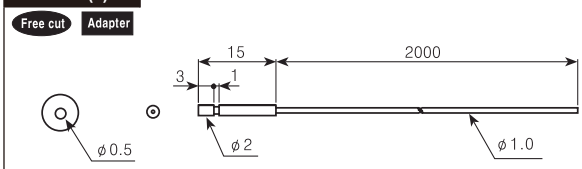
Model	Through-beam type	Model	Through-beam type
FTFU-210-05R	M2-D0.5 / ※Hood material: SUS304	FT-320-05(R)	M3-D0.5



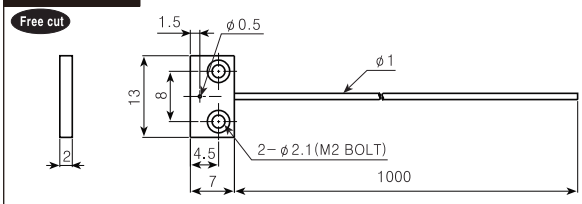


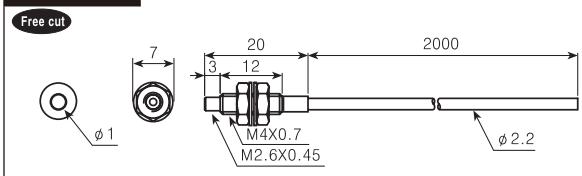
FTFN-210-05R	M2-D0.5 / ※Hood material: SUS304	FTC-220-05(R)	Ø2-D0.5



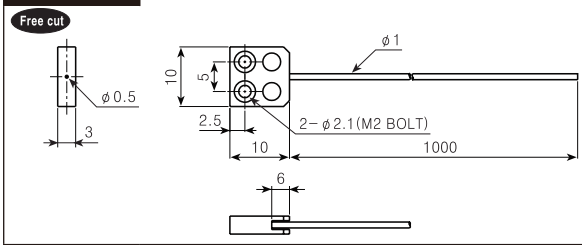


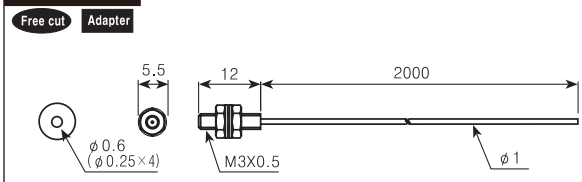
FTF-210-05R	M2-D0.5 / ※Hood material: SUS304	FT-420-10R	M4-D1.0



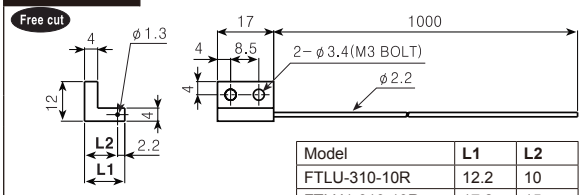


FTFB-210-05R	M2-D0.5 / ※Hood material: AL	FT-320-06B	M3-D0.6

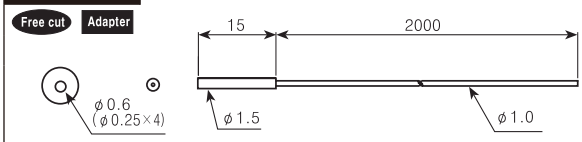




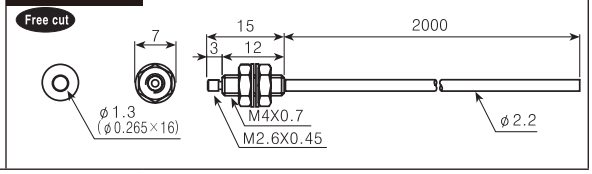
FTLU-310-10R FTLU1-310-10R FTLU2-310-10R	M2-D0.5 / ※Hood material: AL	FTC-1520-06B	Ø1.5-D0.6



Model	L1	L2
FTLU-310-10R	12.2	10
FTLU1-310-10R	17.2	15
FTLU2-310-10R	22.2	20



FT-420-13B	M4-D1.3

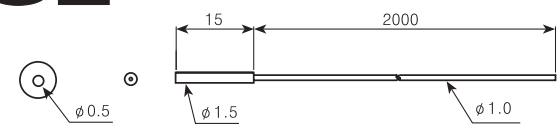


■ Dimensions

Model	Through-beam type	Model	Through-beam type

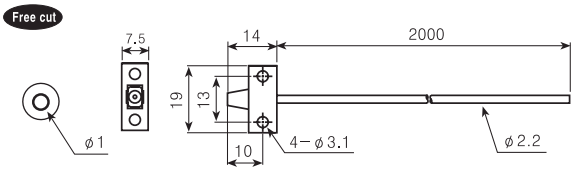
FTC-1520-05 Ø1.5-D0.5

Free cut Adapter



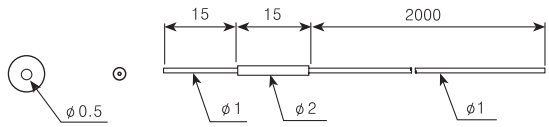
FTP-320-10 D1.0 / Plastic

Free cut



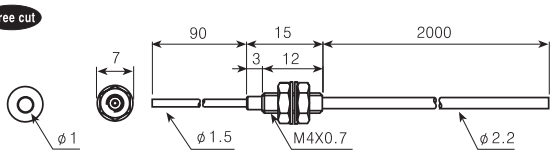
FTCS-220-05 Ø2-D0.5 / SUS Ø1.0×15mm

Free cut Adapter



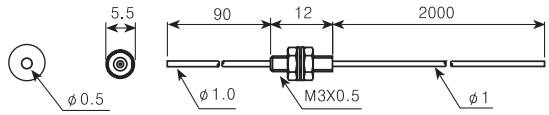
FTS-420-10 M4-D1.0 / SUS Ø1.5×90m

Free cut



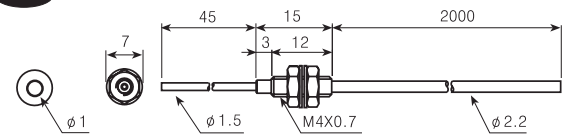
FTS-320-05 M3-D0.5 / SUS Ø1.0×90mm

Free cut Adapter



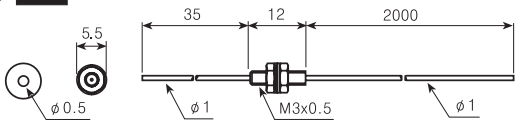
FTS2-420-10 M4-D1.0 / SUS Ø1.5×45m

Free cut



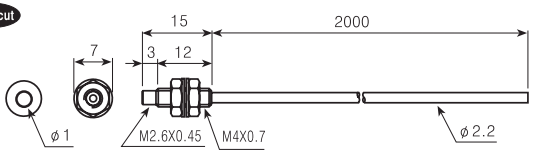
FTS1-320-05 M3-D0.5 / SUS Ø1.0×35mm

Free cut Adapter



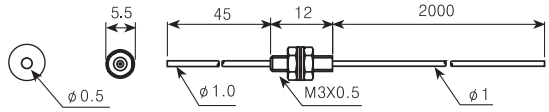
FT-420-10H M4-D1.0 / Heat-resistant 105℃

Free cut



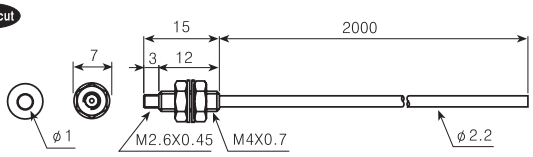
FTS2-320-05 M3-D0.5 / SUS Ø1.0×45mm

Free cut Adapter



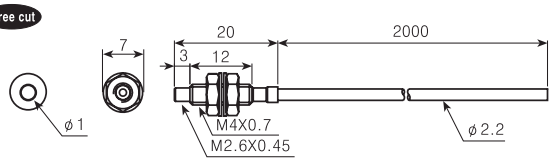
FT-420-15H1 M4-D1.0 / Heat-resistant 150℃

Free cut

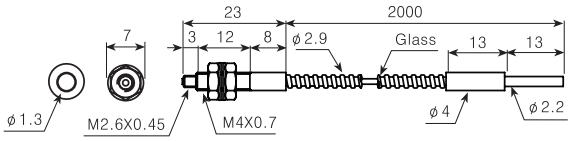


FT-420-10 M4-D1.0

Free cut



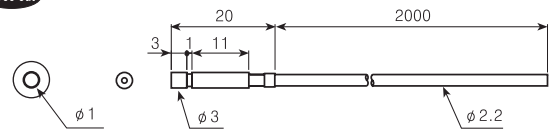
GT-420-13H2 M4-D1.3 / Heat-resistant Max. 250℃ / Glass



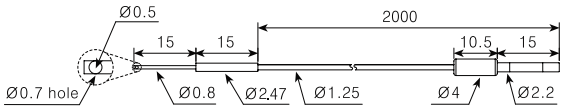
Glass fiber with ø2.9 sus protective armor.

FTC-320-10 Ø3-D1.0

Free cut



FTCSN-2520-05 Ø2.47-D0.5 / SUS Ø0.8×15mm / Side view



■ Lens unit for long distance detection(sold separately)

◎ Model: FTL-M26

<Lens unit> <Mounting at cable>

◎ Mounting of lens

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

◎ Ambient temperature range of lens unit

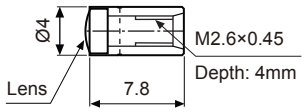
It should be used within -40 to 100℃.(not over 100℃.)

◎ Applicable fiber optic cable and max. mounting distance

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

◎ Dimensions

(unit: mm)

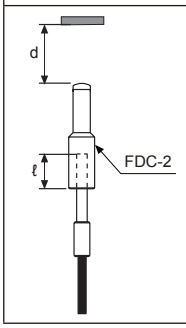
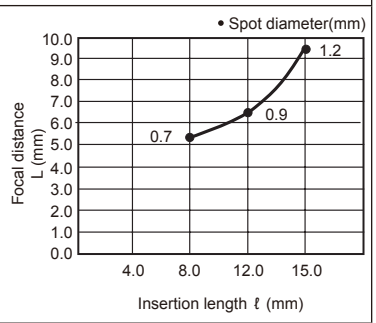


■ Micro spot fiber optic cable and lens unit(sold separately)

◎ Model

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

◎ Feature data

Measuring method	Beam spot characteristic
	

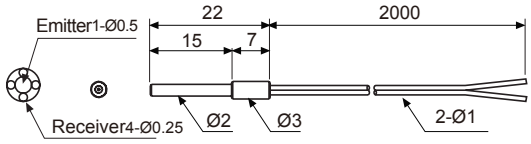
◎ Ambient temperature range of lens unit

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

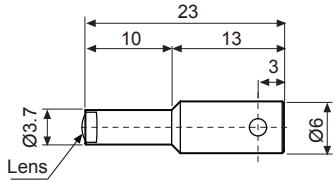
◎ Dimensions

(unit:mm)

- **FDC-320-F**



- **FDC-2**

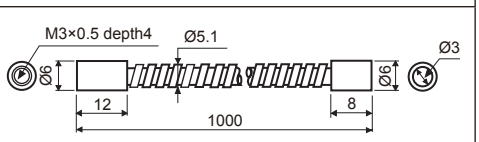
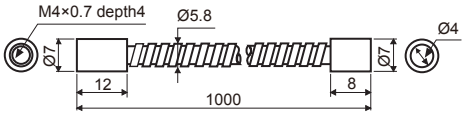
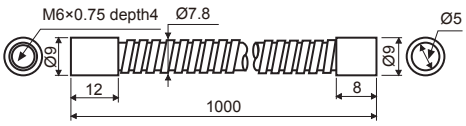


■ Protection tube for fiber optic cable (sold separately)

◎ Application

: Protect cable from impact or cutting

(unit:mm)

Model	Appearance and Dimension
FTH-310	
FTH-410	
FDH-610	

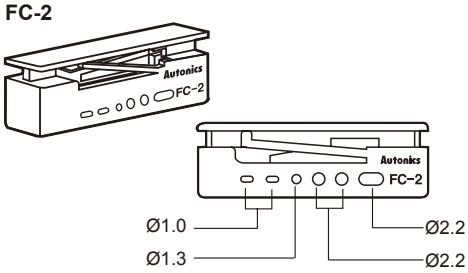
※500mm of protection tube can be customized.
※Additional 8mm is for tube coupling.

■ Accessory

◎ Fiber cutter

Applications: Cutting fiber optic cable, free cut type

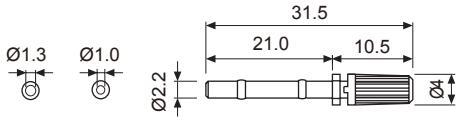
- **FC-2**



◎ Adapter

Adapter: Adapter marked fiber optic cable should be used with adapter

(unit: mm)



※The inside diameter ø1.0(Standard and black)
※The inside diameter ø1.3(Only applied to the receiver of FD-320-F1 and dark gray.)