▣ Fiber Optic Amplifier

Appearances	Characteristic	LED	Model	Power supply	Response speed	Control output	Reference
	Dual display type	Red	**BF5R-D1-N**	12-24VDC	Ultra Fast mode (50μs), Fast mode (150μs), Standard mode (500μs), Long distance mode (4ms), Ultra long distance mode (10ms)	NPN open collector output	**B-9 to 24**
		Green	**BF5G-D1-N**				
		Blue	**BF5B-D1-N**				
		Red	**BF5R-D1-P**			PNP open collector output	
		Green	**BF5G-D1-P**				
		Blue	**BF5B-D1-P**				
	Single display type	Red	**BF5R-S1-N**		Fast mode (150μs), Standard mode (500μs), Long mode (4ms)	NPN open collector output	
		Red	**BF5R-S1-P**			PNP open collector output	
	Standard type	Red	**BF4R**		Max. 0.5ms (Frequency 1) Max.0.7ms (Frequency 2)	NPN open collector output	**B-31 to 37**
		Green	**BF4G**				
		Red	**BF4RP**			PNP open collector output	
		Green	**BF4GP**				
	External synchronization input type	Red	**BF4R-E**			NPN open collector output	
		Green	**BF4G-E**				
	Remote sensitivity setting type	Red	**BF4R-R**				
		Green	**BF4G-R**				
	Built-in twin adjuster type	Red	**BF3RX**		Max. 1ms	NPN open collector output	**B-38 to 41**
			BF3RX-P			PNP open collector output	

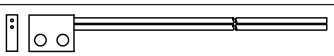
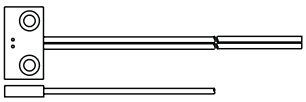
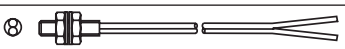
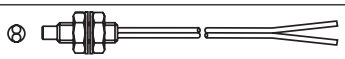
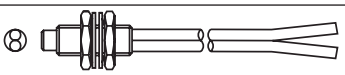
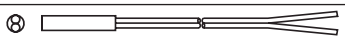
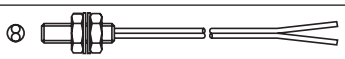
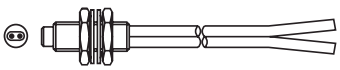
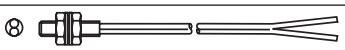
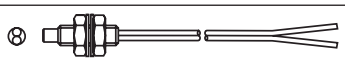
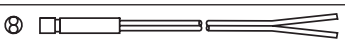
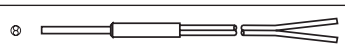
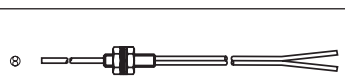
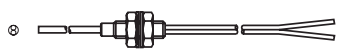
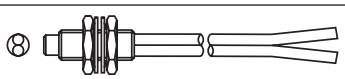
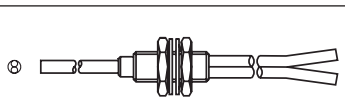
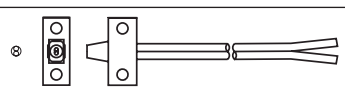
※Sensing type depends on the type of fiber cable.

▣ Fiber Optic Amplifier Communication Converter

Appearances	Characteristic	Model	Power supply	Communication speed	Control output	Reference
	Setting 32 fiber optic amplifier units simultaneously by communication converter	**BFC-N**	12-24VDC	1200, 2400, 4800, 9600, 19200, 38400bps	NPN open collector output	**B-25 to 30**
		BFC-P			PNP open collector output	

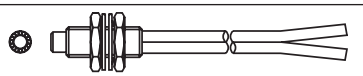
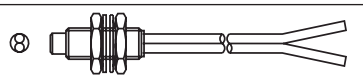
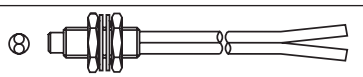
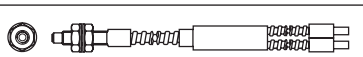
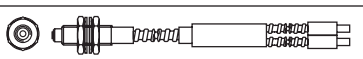
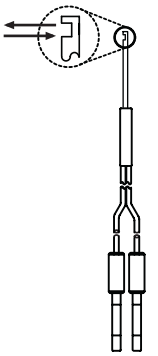
※Connectable fiber optic amplifier unit: BF5 Series

▣ Fiber Optic Cable (Diffuse Reflective Type)

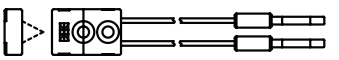
Type	Appearance	Feature	Model	Sensing distance (mm) (based on Non-glossy white paper)	Cable length (L)※3	Reference
Flexible type※4		Flat type/Top view	**FDFU-210-05R**	35※1	1m **Free cut**	B-42 to 50
		Flat type /Side view	**FDFN-210-05R**	30※1		
		Flat type /Flat view	**FDF-210-05R**			
		M3 Bolt	**FD-320-05R**	35※1	2m **Free cut**	
		M4 Bolt	**FD-420-05R**			
		M6 Bolt	**FD-620-10R**	130※1		
Break-resistant type※4		M3 Bolt	**FD-320-06B**	35※2		
		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		
		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**			

※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: Fiber optic cable out of the rated length can be customizable.
※4: ● **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 (Diffuse Reflective Type)

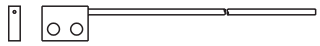
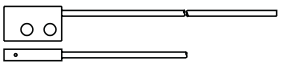
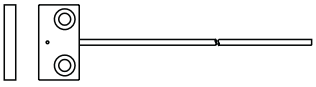
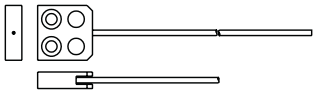
Type	Appearance	Feature	Model	Sensing distance (mm) (based on Non-glossy white paper)	Cable length (L)※3	Reference
Coaxial type		M3 Bolt	**FD-320-F**	40※2	2m Free cut	B-42 to 50
		M3 Bolt	**FD-320-F1**	60※2		
		M6 Bolt	**FD-620-F2**	120※2		
Heat-resistant type		M6 Bolt	**FD-620-10H**			
		M6 Bolt	**FD-620-15H1**	160※2		
		M4 Bolt Glass type	**GD-420-20H2**	100※2	2m	
		M6 Bolt Glass type	**GD-620-20H2**			
Right angle	Line-up 	M6 Bolt	**FDR-610-10R**	120※1	1m Free cut	
Side view		Ø3 Cylinder type	**FDCSN-320-05**	30※1	2m	

■ Fiber Optic Cable (Convergent Reflective Type)

Type	Appearance	Feature	Model	Sensing distance (mm) (based on Non-glossy white paper)	Cable length (L)※3	Reference
Convergent reflective type	Line-up 	Convergent reflective type	**FLF-320-10**	8※1	2m	B-41 to 49

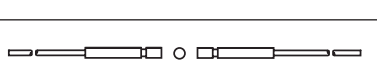
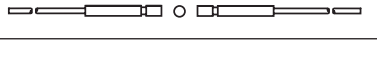
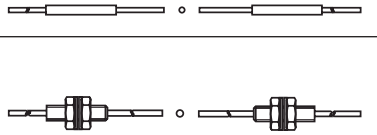
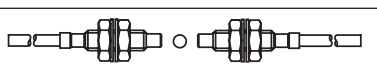
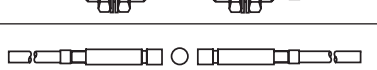
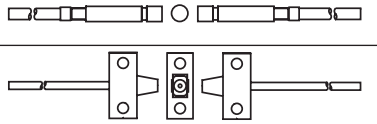
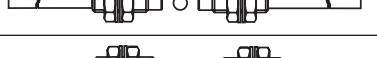
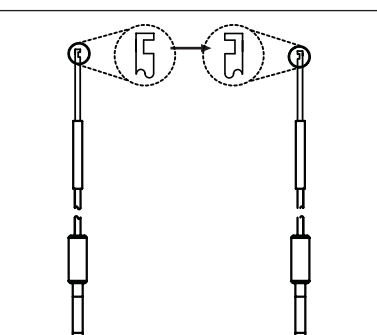
※1: The sensing distance is a standard for BF5 Series.
※2: The sensing distance is a standard for red LED of BF4 Series and 10% of red LED is applied when it is green LED.
It is applied to 40% of sensing distance for BF3RX.
※3: Fiber optic cable out of the rated length can be customizable.
※Free cut 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.

▣ Fiber Optic Cable (Through-Beam Type)

Type	Appearance	Feature	Model	Sensing distance (mm) (based on Non-glossy white paper)	Cable length (L) ※3	Reference
Flexible type ※4		Flat type/ Top view	**FTFU-210-05R**	110※1	1m Free cut	B-42 to 50
		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			
		M3 Bolt	**FT-320-05R**	110※1	2m Free cut	
		Ø2 Cylinder type	**FTC-220-05R**			
		M4 Bolt	**FT-420-10R**	500※1		
Flexible type ※4		M3 Bolt	**FT-320-06B**	110※2		
		Ø1.5 Cylinder type	**FTC-1520-06B**			
		M4 Bolt	**FT-420-13B**	400※2		

※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: Fiber optic cable out of the rated length can be customizable.
※4: ● **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.]
※FT-420-13 was discontinued. FT-420-13B is replacement.

▣ Fiber Optic Cable (Through-Beam Type)

Type	Appearance	Feature	Model	Sensing distance (mm) (based on Non-glossy white paper)	Cable length (L) ※3	Reference
Standard type		M3 Bolt	**FT-320-05**	150※2	2m Free cut	B-42 to 50
		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		
		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		
		M4 Bolt	**FT-420-15H1**	500※2		
		M4 Bolt Glass type	**GT-420-13H2**	400※2	2m	
Right angle	Line-up 	M4 Bolt	**FTR-410-10R**	460※1	1m Free cut	
Side view		Ø2.47 Cylinder type	**FTCSN-2520-05**	120※1	2m	

※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: 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.